Field Artillery

A Professional Bulletin for Redlegs

March-April 2000

TRAINING
The FA Way

HQDA PB6-00-2

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INTERVIEW

ARTICLES—Training the FA Way

FEATURE ARTICLES

DEPARTMENTS

Front Cover: First Lieutenant Francisco "Frank" Leija has his war paint on for his January rotation at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana. He is the Executive Officer for A Battery, 4th Battalion, 11th Field Artillery, which is direct support to the 172d Infantry Brigade (Separate) in Alaska. *(Photo by Raymond A. Barnard, Command Photographer, JRTC)*

PURPOSE: (as stated in the first ***Field Artillery Journal*** in 1911): *To publish a journal for disseminating professional knowledge and furnishing information as to the Field Artillery's progress, development and best use in campaign; to cultivate, with the other arms, a common understanding of the power and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.*

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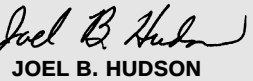

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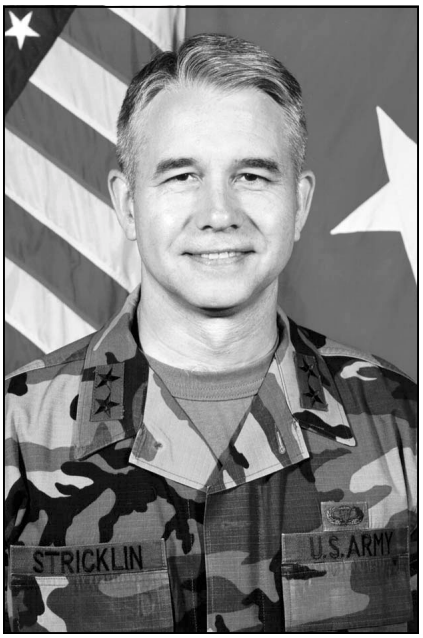
Transforming the FA and Force



With six months in the saddle as your Commandant, we are making some measurable progress on issues that concern us all. We're in the intense process of transforming our Army and, simultaneously, identifying and addressing maneuver commanders' fire support issues.

Transforming the Force. As you know, the Army Chief of Staff has formulated his vision for the Army's future and has put us all on an aggressive transformation path. The Field Artillery School has labored long and hard to anticipate and define the requirements for fire support for this transformation process. We've been engaged with the Training and Doctrine Command (TRADOC) for the past four months, developing the overarching organizational and operational (O/O) concept that will drive the requirements for the Initial Brigade Combat Teams and the follow-on Interim Brigade Combat Teams (IBCTs). The first of two Initial BCTs is scheduled to be on the ground, ready to train, at Fort Lewis, Washington, in late 2000 with three Interim BCTs to begin fielding in FY 2003.

We also have started developing the objective force O/O that focuses on 2010 and beyond. The objective Army force will have a lighter, more lethal and deployable core with a heavy counterattack capability for maximum versatility across the entire spectrum of military operations.

Simultaneously, the FA School has been helping to develop a mission needs statement (MNS) and operational requirements document (ORD) to establish the requirements for a family of vehicles. The family will provide the common chassis for BCT vehicles, including a fires delivery platform and fire support vehicle to support the IBCTs.

This rapid development has been fulltime work for the FA School—days, nights and weekends—since mid-October 1999. While much remains to be done, the development process is moving forward, and the Field Artillery has played a significant role in the Army's transformation. Although some details of the O/O and ORD are yet to be decided, let me share the overarching themes I think will interest you.

First, the Field Artillery is resident in all transitional organizations. Direct support (DS) cannon artillery (including counterfire radar) is an integral part of each BCT. Reinforcing artillery is characterized in the augmentation to the BCT. This artillery is resident in division artilleries and FA brigades—no significant changes to these organizations.

The BCT's center of gravity is its dismounted infantry. We have the greatest dismounted infantrymen in the world; however, they are vulnerable to mortar, artillery and rocket fire. Central to our DS role is the fires and effects coordination cell (FECC); this is a beefed-up fire support element (FSE). The FECC is larger and has more responsibilities than a normal brigade FSE—the integration of lethal and non-lethal targeting and counterfire effects. Using both Army and joint systems, it will support dismounted infantry operations.

Proactive counterfire takes on a special role in the close supporting fires of the BCT. It's enabled by organic and external sensors linked to the FECC and by delivery platforms. The BCT's artillery must capitalize on range, lethality and deployability to accomplish its mission.

The Initial BCTs will be fielded almost entirely with off-the-shelf equipment—with the exception of a few surrogate medium armored vehicles. For this reason, we'll field a towed howitzer battalion in support of the two initial brigades at Fort Lewis. These first two brigades will focus on integrating the special synergistic capabilities of training, leadership development, doctrine and tactics, techniques and procedures (TTP) with the off-the-shelf equipment solutions.

For the IBCTs, a self-propelled 155-mm howitzer is required with a maximum range of 30 kilometers and a maximum rate-of-fire of no less than five rounds per minute. We will integrate a 155-mm cannon onto the chassis of one of the vehicles common to the brigade—interim armored vehicle (IAV) or family of medium tactical vehicles (FMTV). Accordingly, a C-130 aircraft must transport the howitzer.

The objective force, which could start fielding as early as FY 2010 to 2012, will have cannon and rocket capabilities integrated onto the chassis of the future combat system (FCS). Crusader (light)—the restructured Crusader program with a 38- to 42-ton objective howitzer weight—will begin fielding in FY 2008 and the future DS weapon system, which will replace the aging M119 howitzer, are key technology carriers for the FCS.

This is only a quick snapshot of the fire support developments in support of the Chief of Staff's transformation campaign plan. I will provide more information on the transformation in a later edition with an article that lays out the plan and the role of fire support in greater detail.

Supporting the Maneuver Commander. When I assumed command of Fort Sill last August, there were indica-

tions that some maneuver commanders were concerned about the FA School's commitment to combined arms operations and support of maneuver commanders. The Commandant of the Infantry School, Major General Carl F. Ernst, published an article in the September-October 1999 edition: "Is the FA Walking Away from the Close Fight?" This was followed by the interview of Lieutenant General Kevin P. Byrnes, Assistant Vice Chief of Staff of the Army and former 1st Cavalry Division Commander, in the January-February edition: "Responsive Fires for the Maneuver Commander." These two pieces also question whether Fort Sill is committed to supporting our maneuver commanders in combined arms operations.

Such questioning is indicative of perceptions and compelled me to take a close look at the Field Artillery School's involvement with our maneuver commanders. My goal has been to determine the maneuver commanders' thoughts regarding fire support.

Hence, I visited units—the Eighth US Army and the 2d Infantry Division in Korea; III Corps and its 1st Cavalry Division and 4th Infantry Division (Mechanized) at Fort Hood, Texas; the XVIII Airborne Corps and 82d Airborne Division at Fort Bragg, North Carolina; the 40th Infantry Division (Mechanized) of the California Army National Guard; the Third US Army at Fort McPherson, Georgia—and talked to corps commanders, division commanders, brigade commanders and fire support coordinators (FSCOORDs) at each of these units. I talked with Combat Training Center and operations group commanders at the National Training Center (NTC), Fort Irwin, California, and the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana. In the process, I've spoken with unified commanders-in-chief, joint force land component commanders (JFLCCs) and Army service component commanders.

After all my research, I concluded there is, indeed, a strong perception that the FA School has turned inward, focusing on FA branch issues at the exclusion of support for the maneuver commander in combined arms operations. As long as this perception exists, the FA School has a problem—perceived, if not actual.

I then hosted the Tactical/Operational Fire Support Conference for maneuver commanders, their FSCOORDs, command sergeants majors and the FA School in January. We had about 160 participants representing echelons-above-corps, echelons-above-division, division, brigade and task force levels. We divided them into seven groups, each with the mission of solving three or four difficult fire support issues, as defined by maneuver commanders.

As a result, we have six or seven maneuver commander issues that have immediate solutions and another eight to 10 issues with solutions that will require more coordination but are relatively easy to implement. The balance of the issues discussed at the conference call for long-term solutions or solutions beyond the scope of the FA School to implement.

The Tactical/Operational Fire Support Conference was a great success for maneuver commanders and FSCOORDs. It reinforced my personal interest in the dialog we've established with our maneuver commanders. I will continue all efforts to foster an even closer relationship between the FA School and the field.

Although very productive, the January conference doesn't obviate the need to conduct our periodic Senior Fire Support Conference (SFSC). The next SFSC is 23 through 27 April 2001 here at the FA School.

So, once again, read and discuss the issues outlined in the articles in this edition, which has the theme of "Training." The articles, letters-to-the-editor and candid input have been a major factor in my research and in making *Field Artillery* the best professional journal in the Army. For that, I thank all artillerymen worldwide—Active and Reserve Components and "retired, but still serving." You are making a significant contribution to your branch and the maneuver commanders we serve.

We are hot on the trail of new doctrine, training simulations, revised institutional training courses and materiel to ensure Field Artillery remains *The King of Battle!*

INCOMING

LETTERS TO THE EDITOR

Fixing Fire Support for World Fires

The "World Fires" edition [January-February] continues the timely discussion on how Redlegs, et. al., view the role of Field Artillery, especially fire support. I agree with much of what was said: we have, perhaps, become enamored with the deep fight, and we do need to improve fire support training.

However, I respectfully disagree with one of Lieutenant General Kevin P. Byrnes' points in his interview [Assistant Vice Chief of Staff of the Army and former CG of the 1st Cavalry Division, "Responsive Fire Support for the Maneuver Commander"]: fire support *is* hard. His context may be that fire support is not intellectually difficult for some, but the successful application of fire support TTP [tactics, techniques and procedures] is a unique challenge.

I've been a fire support officer (FSO) for much of my 21-plus-year career, most recently, 30 months as the IIId Armored Corps Deputy Fire Support Coordinator [DFSCOORD]. My career path has enabled me to get very good at one thing, at least according to others—fire support. I'd like to offer some observations that may just add some spice to the discussion forum.

Assignments. We have it about right, vis-à-vis assigning enlisted fire supporters, but not officers. The challenge is to assign the right officer to the right slot and then leave him there long enough to do the job. Experience comes with time, and fire support positions must be made a priority because supporting maneuver commanders is the reason we exist as a branch.

Today, sustaining digital proficiency is a challenge. The idea has surfaced to stabilize selected personnel in digitized units. What if we took the same approach for FSOs and FSNCOs [fire support NCOs]? The active component has struggled with assignment policies for years, and, hopefully, OPMS [Officer

Personnel Management System] XXI will help solve the current conundrum for some artillery majors.

In my present job, I see our National Guard commanders and FSCOORDs have unique recruiting and retention challenges at every level, which are compounded by limited training days and the looming fielding of digital systems. But whether active or National Guard, "revolving door" assignments for officers and the tension caused by trying to get officers "though their gates" or "well rounded," sometimes as required by law (e.g., joint), simply don't set the conditions for success as an FSO. They also don't instill our maneuver commanders with confidence in our fire support capabilities.

Training. We can have the best fire support doctrine and organizations and stabilized fire support teams, but until we solve the training issues, we're only addressing the form, not the function. Fire support conferences are great, such as the AC/RC [Active Component/Reserve Component] gathering hosted by Fort Lewis [Washington] in February, as are simulations, artillery tables and command post exercises (CPXs). But fire support training is not like M1 and M2 tables where you can practice run after run until you get it right.

One of the best ways I've seen to train fire supporters is to let them train with each other and their supported maneuver units. But who has the time? Commanders should encourage their FSOs and FSNCOs to cross-train, even at the combat training centers (CTCs), and train *every time* maneuver trains. As personnel tempo (PERSTEMPO) continues to rise and we continue to careen from one priority to another, we need to allow our fire supporters to share experiences and TTP.

Unfortunately, that seems to happen only during the crucible of training, and by then, fire supporters are so busy doing their jobs that they can only take notes and, hopefully, apply what they learned the next time—if they get a next time. And if the next time is combat, it will be too late.

Competence is Relevant. Redlegs have earned a reputation as technical experts of an exacting craft. Fire supporters are further asked to couple this expertise with tactical acumen to help maneuver commanders and staffs synchronize a myriad of complex tasks on an increasingly integrated analog and digital, joint and combined battlefield.

To do this, "maneuver speak" becomes our second language. We live with our supported commander, learning through personal contact how he thinks and fights his unit. Together, we study how the enemy operates and how the terrain affects the combined arms team. We learn how to apply decide-detect/track-deliver-assess (D^3A) in specific theaters, maximizing the entire suite of sensor-to-shooter linkages in the process. It takes time to do all this, but it's a beautiful thing when you gain a maneuver commander's confidence and know he'll never go anywhere without you.

Promotion and Schooling. There's an elephant in the room—fire support is not viewed as career enhancing. We've "sold" the concept to everyone but ourselves and, it seems, HQDA [Headquarters, Department of the Army] selection boards. The recent decision to no longer recognize the brigade FSO job as branch qualifying is a prime example—*amazing!*

At every level we assign either inexperienced officers as FSOs, or in the case of non-resident Command and General Staff College (CGSC) graduates, majors who must "prove themselves" before being considered for a "real job" in the artillery community. We often do the same thing with captains—make them task force FSOs before they command.

I'm not implying any of these officers are "duds." But I am saying that instead of training them in their profession in an artillery battalion and then assigning them as FSOs at progressively higher levels, we have it backwards.

What message does this send to maneuver commanders? FSO billets should be for those we have groomed at each level to be our ambassadors. These billets should not be perceived as a "holding pattern" or a way to help artillery commanders select our "best and brightest" for jobs inside the artillery battalion.

Summary. As General [Thomas A.] Schwartz [former Commanding General of Forces Command] is fond of saying, "We need less *Hooah* and more *Do-oah*"—in this case, in terms of fire support assignment policies and tour length, training and promotion potential.

We also need to correct a few false perceptions. Many officers don't opt to enter or stay in the fire support lane because it is perceived to be "hard." In a certain context it is, but there's satisfaction that comes with seeing the successful integration of lethal and nonlethal fires and maneuver to accomplish the mission. Redleg fire supporters can be proud they're helping the Army move confidently forward into the 21st century supported by world fires.

LTC Stuart G. McLennan III, FA
Cdr, 2d Bn (FA), 395th Regt
2d Bde, 75th Trng Spt Div
Fort Hood, TX

Response to "Is the FA Walking Away from the Close Fight?"

The former Chief of Infantry, Major General Carl F. Ernst, sent the artillery community a "call for fire" when he asked, "Is the FA Walking Away from the Close Fight?" [article of the same title, September-October 1999] and the Chief of Gunnery [Colonel Thomas G. Waller, Jr. in his letter to the editor, "We have Work to Do," January-February 2000] answered his call with a metaphorical "Shell smoke, in effect!"

We, as artillerymen, owe our infantry counterparts a solution based on technical and tactical data coupled with prudent safety measures and the willingness to train our soldiers to a razor's edge. This will require a study of historical vignettes (as produced by the second and third responses of the same edition), a critical analysis of the current MSDs [minimum safe distances] as calculated in AR 385-63 [Policies and Procedures for Firing Ammunition for Training, Target Practice and Combat] and the support of post commanders at the various installations in our Army.

Robert H. Scales, Jr., addressed the issue in his book *Firepower in Limited War*. In the battle for Mount Longdon in the Falklands Campaign, the British paratroopers were ill prepared to adjust fire at close ranges. A member of the 3d Paratroopers lamented "...most of the troops had no idea what a 105-mm shell sounded like at 50 metres, let alone its effect. While they were getting used to it, the enemy had the upper hand."

I'm not suggesting we fire artillery 50 meters from friendly troops in peacetime, but, certainly, we can make an effort to be more realistic. The average 13F [Fire Support Specialist] soldier today stands on an OP [observation post] and adjusts fire 2,000 to 3,000 meters away.

One reason he is not familiar with close fire is our impact areas do not facilitate danger close fires. My "first volley" would be to ask the installation commanders to set up OPs and, where feasible, allow 13F soldiers to CFF [call-for-fire] at distances of 600 to 1,000 meters as a matter of routine training.

Next, we should take a calculated and critical look at the current MSDs. I suggest that a medium between the REDs [risk estimate distances] MG Ernst cites and the actual MSDs can be reached. As an example, the MSD for a 105-mm howitzer, calculated for low-angle overhead fire, is between 384 and 636 meters, depending on range-to-target and charge fired. This is too far away to help MG Ernst or any other infantryman in a close fight.

We can close this distance significantly by taking several prudent measures, such as soldiers' wearing body armor, staying prone and exercising tactical patience and our using terrain to advantage, conducting registrations prior to firing and using a creeping fire technique in the adjustment phase of the call-for-fire. Obviously, a more detailed analysis than can be cited in this forum is needed, but anyone who has seen mortar and artillery fire impact at the current MSDs realizes we can get closer safely.

Any reduction in the MSDs will require support from the installation commander and the entire chain of command. A well-researched plan (devised by fire supporters *with* their supported infantry) with detailed safety implements and a calculated acceptance of the inherent risks is needed to hurdle this obstacle and train our soldiers for the next two-way firefight.

If we can go past the MSDs and approach the REDs, we'll be much better suited to employ our fires in combat and avoid experiencing the same dilemma the 3d Paratroopers had in their fight for the Falklands.

CPT David S. Flynn, FA
FSO, 3d Ranger Bn
Fort Benning, GA

Response to "AC Training Support Brigade Assistance for RC Redlegs"

Lieutenant Colonel Gary A. Lee's article " AC Training Support Brigade Assistance for RC Redlegs" (September/October 1999) is a superb overview of how AC, Active Guard/Reserve (AGR) and US Army Reserve (USAR) training support battalion (TSBn) teams train affiliated National Guard (NG) units under Training Support XXI (TS XXI). I spoke with LTC Lee and would like to expand on two of his points.

TSBn Organization and Training Support Operations. The AC TSBn structure does not include a robust combat support/combat service support (CS/CSS) trainer capability. In fact, my battalion [2d Battalion (Training Support) (FA), 395th Regiment, Fort Hood, Texas] only has a headquarters battery (HHB) trainer (captain, 13A) and a supply sergeant (92Y30). The TS XXI solution is to fully integrate USAR CS/CSS specialists and AC TSBn personnel to train logistics systems in the combat trains, field trains and brigade support area. My battalion successfully employed this AC/RC team during three AT [annual training] periods this past year. It works, as it capitalizes on the strengths of each member of the team.

One challenge that AC TSBn commanders face is how to sustain digital subject matter expertise once a soldier reports from an MTOE [modified table of organization and equipment] unit equipped with ATCCS [Army tactical command and control system]. For example, three of my affiliated NG units are in varying stages of M109A6 Paladin fielding and AFATDS [advanced FA tactical data system] fielding looms in the RC from FY01 to FY07.

The solution includes assigning the right soldiers to AC/RC TSBns and then allowing appropriate schooling and training opportunities with AC units. This ensures the right soldiers function as AC/RC trainers, digital skills remain honed to provide maximum training support to NG units and AC/RC soldiers are best prepared to return to an MTOE unit eventually.

TS XXI Organizational Challenges. Enhanced separate brigades (eSB) have multiple sources for training guidance, assistance and supervision, and many force support package (FSP) battalions are geographically affiliated for training with non-Wartrace brigade headquarters. Forces Command (FORSCOM) Regulation 350-2 Reserve Component Training addresses AC senior mentor, peer mentor and training support roles under TS XXI. These roles need to be fine-tuned based on the realities of state adjutants general (TAG) requirements, Wartrace missions and integrated divisions, teaming and multi-component operations.

TS XXI successfully integrates AC, USAR and AGR into one team to train America's citizen soldiers in the NG for operations in the 21st century. Challenges abound, as with any new system, but TS XXI maximizes the talents of each component and allows us to move confidently forward as "The Army."

LTC Stuart G. McLennan III, FA
Cdr, 2d Bn (FA), 395th Regt
2d Bde, 75th Trng Spt Div
Fort Hood, TX

Three Brothers Command Same FA Brigade. Colonel Gary Bray (center) assumed command of the 45th Field Artillery Brigade (FAB), Oklahoma Army National Guard, during ceremonies held at the Enid National Guard Armory on 6 February 2000. Colonel Bray was joined at the ceremony by his brothers, Colonel (Retired) Kenneth Bray (left) and Colonel (Retired) Lonnie Bray. The retired colonels at one time also commanded the 45th FAB.

SAFETY—Reduced Crew Procedures for MLRS

The Gunnery Department of the Field Artillery School, Fort Sill, Oklahoma, developed an interim change to *Technical Manual (TM) 9-1425-646-10-2 Multiple-Launch Rocket System (MLRS)* and sent it to the field. The change lays out the procedures for safe reduced crew operations. The need for the change was identified during an investigation of accidents involving M270 launchers manned by two soldiers instead of the normal three.

This article is to inform the field of the change to the TM and highlight the procedures found therein.

Reload Procedures. The interim change takes the crew through the most dangerous and vulnerable part of launcher operations: the reload. The section chief must use extreme caution when ground guiding the launcher into the reload point.

Because there is no ground guide to the rear of the vehicle, the section chief should use one of the ammunition crew to help in ground guiding the launcher if possible. The last movement of the launcher before upload will be in the forward direction. The section chief must visually check the driver's actions to set the transmission to neutral, set the parking brake and engage the suspension lockout. The section chief then can move behind the launcher to unlatch the pods.

The driver performs the functions of the gunner. After he sets the throttle, he selects the boom control menu and enters the desired launcher-loader module (LLM) position. When the LLM has moved to the selected unloading position, the driver exits the cab and helps the section chief disconnect the W19/W20 cables. The driver secures the boom controller as the section chief conducts a short no-voltage test.

At no time will sections upload or download two pods at the same time. The section chief must use one hand for signaling and the other hand to balance the pod. After the pods are uploaded, the driver enters the cab and stows the LLM on the section chief's order.

The interim change doesn't direct how the section chief and driver process fire missions. Unit standing operating procedures (SOP) should establish that during movements; the call-for-fire is initiated by voice to give the section chief time to stop the launcher before answering the call-for-fire on the fire control panel.

Command Responsibilities. The publication of reduced crew procedures is included in all cannon weapon systems, and now MLRS, to describe the absolute *minimum* requirements for the safe operation of the system. It is a unit leadership responsibility to perform the safety risk analysis before conducting reduced crew manning. The unit must weigh the advantages and disadvantages of operating with reduced crews and continuously perform risk analysis during extended night or adverse weather operations to ensure crews can perform under reduced manning. Commanders ultimately must make the call and they should use extreme caution due to the small size of MLRS crews.

The FA School has developed these procedures to help the commanders in situations where two-man operations may be required; however, we emphasize to commanders that the operating standard is a three-man crew per launcher.

There won't be a published change to TM 9-1425-646-10-2 (April 1998). The interim change will be incorporated into the new Interactive Electronic Technical Manual (IETM) for the M270 launcher, which will be available in late June 2000.

The interim change to TM 9-1425-646-10-2 can be downloaded from the Gunnery Department's home page (http//sill-www.army.mil/gunnery/) or by requesting a copy from Chief, MLRS Division, ATTN: ATSF-GR, US Army Field Artillery School, Fort Sill, Oklahoma 73503-5100. The e-mail address is poirierm@sill.army.mil.

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AUSA Essay Contest

The Association of the United States Army (AUSA) has established three prizes of up to $5,000 for essays about future concepts for a Mobile Protected Fighting Space System. (Here, "Mobile Protected Fighting Space System" is defined as an operating weapon system for Army troops.) This contest is designed to promote conceptual thinking for the design, development and use of a new Army ground combat system around the year 2025.

Prizes and Judges. The top essay will receive $5,000 with the second receiving $1,000 and third $500. The three essays will be published in *Army* magazine and presented at this year's annual meeting. *Army* reserves the right to edit the essays that it publishes for style and accuracy.

AUSA will assemble a distinguished panel of military and civilian experts to judge the essays. The panel will be chaired by General (Retired) Glenn K. Otis, an AUSA Senior Fellow.

Contest Rules. The contest is open to anyone except employees of AUSA. The essays must be original compositions written solely for this contest. An entry must be 2,000 words or less, double-space typed and submitted in triplicate. Charts and illustrations may be included but do not count against the 2,000-word length.

The essay must have a title page listing the author's name, address, telephone number and social security number (SSN). All subsequent pages must be identified by the author's SSN. Essays will be judged without the contestants' names available to the judges.

All submitted essays become the property of AUSA, which will have sole and exclusive copyright to them.

Submissions. Essays should be sent to the Institute of Land Warfare, Association of the United States Army, MPFS Essay Contest, 2425 Wilson Boulevard, Arlington, Virginia 22201-3385. The submissions must be postmarked no later than 30 July. Letters notifying winners will be sent in September.

Inquiries concerning the contest should be directed to the Institute of Land Warfare, 1-800-336-4570; 703-841-4300, Extension 229. (E-mail: vcable@ausa.org).

Brigadier General (Retired) Samuel S. Thompson III
Former Commander of the Joint Readiness Training Center, Fort Polk, Louisiana

Communications on the Battlefield
Key to Combat Success

Interview by Patrecia Slayden Hollis, Editor
Photographs by Raymond A. Barnard, Command Photographer, JRTC

JRTC CG's Teacher, Coach and Mentor "Uniform"

The Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, trains the totality of the light brigade task force on tough missions in a realistic, uncompromising environment. Every light infantry brigade and battalion rotates through the JRTC at least every two years, training on missions across the spectrum of military operations-the offense and defense, airborne, air assault, special forces, military operations in urban terrain (MOUT), search and attack guerilla forces, raids into enemy territory, mission rehearsal exercises (MREs) for stability operations and others.

The JRTC conducts 10 rotations per year for National Guard, Reserve and active units, often in light-heavy mixes, on just under 200,000 acres of ranges.

Q *The JRTC trains a wide range of missions—what do you see as the biggest fire support challenges for rotational units?*

A The JRTC has worked hard to create a very realistic training environment, including asymmetrical and stability operations that are especially relevant to the times. I have been fortunate enough to be assigned here in 1992 and then again in 1997 and have seen our light forces make strides in terms of learning and applying that learning to military operations.

Our forces have made significant strides in what I call "fighting with fires." Units are better able to put the totality of fire support together. They do better jobs of integrating intelligence into fire support plans and making sensor-to-shooter TTP [tactics, techniques and procedures] work.

But communications is the weak link in fire support. It's usually the area that causes things to fall apart. It can be due to distance or miscommunications. It can be because folks haven't trained together enough to think alike, be in synch. Maybe a unit doesn't have redundant means of getting firing data back to the shooters. Or maybe the unit didn't conduct a rehearsal to ensure all fire supporters, from the sensor back to the shooters, are on the same sheet of music. Sounds pretty basic, doesn't it? But these problems happen quite often.

On the JRTC battlefield—or any other battlefield—everyone's head has to be in the same "game." Sometimes there comes a point in the battle when the plan works and the task force has stopped the enemy mechanized force for 10 or 15, maybe even 20, minutes (before he figures some way around the obstacle). The task force has its moment of opportunity.

Rarely do units get it right and bring in a deadly combination of artillery, attack aviation and CAS [close air support]. Normally, either the observer is dead or he calls-for-fire and is overridden by the FSCOORD [fire support coordinator].

That's another communications issue. At the moment of truth, the FSCOORD makes the decision that the observer's target is not "the priority target." He doesn't really understand what has just been transmitted to him and what the brigade commander is doing on the battlefield. I often find that the maneuver commander and his fire supporter aren't thinking alike—and that's a communications challenge all the way down to the platoon level.

Another fire support challenge is that mortars too often are left out of the fight. Units sometimes have a good mortar lieutenant and sergeant, and sometimes they don't. Mortars are too valuable to have inconsistent performance.

The FA School ought to be in charge of all mortar training, doctrine and materiel development. Mortars ought to be organic to the brigade and fired by infantrymen but under the control of the brigade FSO [fire support officer].

The FA School needs to expand its syllabi for its other courses to include more on mortars because, right now, artillerymen get little exposure to mortars. There ought to be one family of ground fires with mortarmen and artillery in synch—now it's almost left to happenstance.

Another area that needs improvement at the JRTC is dealing with minefields. At any one time, the JRTC battlefield will have seven to 12 active minefields. Over the years, units haven't gotten any better at dealing with minefields—the whole issue of detecting, reporting, reducing and securing them.

Americans don't have enough tactical patience. They are mission-oriented. If the mission is to go from Point A to a new firing position at Point B, then that's what they're going to do. If there's a minefield in between, they'll figure out a way to either go through it or around it—not reduce or secure it. What that means is other elements of the brigade task force come along behind the unit and run into the same minefield. And elements run into it that night, the next morning, at noon...endlessly. Units must learn the patience to reduce or destroy the minefield to protect the rest of the task force and then secure the area to keep the guerrillas from coming back and re-seeding it.

Ninety-five percent of the problems I've seen at the JRTC battlefield are caused by inadequate training—not by equipment or doctrine. We have to shift the paradigm of how we're organized at home station and how we train. We're looking at a new Army.

Q *How should units be organized and conduct home-station training for the JRTC?*

A Every time the Army deploys a light brigade task force for an actual mission around the world, we have a heavy component that goes with it. We create brigade and battalion S5s "out of hide." We also have civil affairs (CA) and psychological operations (PSYOPS) and other personnel who go with this brigade task force. But it's not the same organization that comes to the JRTC to train for its mission.

General Thompson confers with troops at Geronimo Drop Zone during early-entry operations.

When rotating units do bring a heavy team, usually a balance of two tank platoons, two Bradley [fighting vehicle] platoons and all their associated people and equipment, they come to the JRTC having to relearn the lessons of World War II. How do we communicate? How do we support each other with our fires?

It seems to me that, as we look to a transitioning Army, units ought to be organized the way they're going to deploy in the future so they can train that way at home station—not just at the training centers. We shouldn't be putting task forces together for the first time when we deploy them in military operations around the world.

Training brigade task force operations at home station is very resource intensive, but units just have to "bite the bullet." Division commanders can make it happen—but it's tough because they have to give up something else.

The Forces Command (FORSCOM) commander mandated that units have to go through a "gate" at home-station training before going to one of the combat training centers [CTCs] and that the training must be as much like the CTC as possible. Units cannot come to the training center, put it all together for the first time and think they're going to operate at the Ph.D. level—it just doesn't happen.

The mistakes units make in training today will "come due" in combat tomorrow. The convoy will be stuck in a minefield, the 105s will be out of HE [high-explosive ammunition], the Q-36 [Firefinder radar] will be positioned with a mask angle that won't allow it to detect the source of the enemy mortar firing deadly volumes—there are hundreds of things that can go wrong. The pressure will be on with everything happening at once.

Then add the inevitable chaos and noise of combat—it will be like trying to operate in an intense lightning storm in the middle of the night. And there will be no changing the battlefield one iota—events will just unfold.

Before combat, units have to figure out how to deal with all that. They have to experience that kind of realism and rigor at home station and then reach the Ph.D. level at the training centers.

General Thompson flying to the Alexandria Airport to pick up a VIP. The JRTC has more than 150 O-6 and above VIPs per month.

Units must have the basics down cold. They must drill soldiers until they can, say, rapidly and accurately lay the guns on a priority target when they're tired. Because in combat, those soldiers are going to be *really* tired. They have to know how to work a rehearsal to ensure the observer is positioned to be most effective, has a backup observer and can send the targeting data back to the guns. If units have not worked that level of detail at home station, then the rest is not going to work at the CTC or in combat.

Let me give you an example of how critical thorough home-station training is. The one thing ground maneuver commanders consistently walk away from the JRTC with is how important their Q-36 radars are to their missions. The radar is key to their counterbattery.

If commanders tie their intelligence to radar operations, the radars become very deadly—rapid predictors of fleeting guerrilla targets, such as mortars. And the radar also quickly becomes the enemy's number one target. Commanders don't know all that when they come to the JRTC.

Now, I know this because I was once an infantry brigade commander who came to the JRTC to learn it. By the end of my rotation, I was paying more atten-

tion to the positioning, security and operations of my radar than any other part of my brigade. Wouldn't it be nice if brigade commanders understood that before the rotation?

Q *What is the role of fire support in MOUT?*

A The enemy loves to fight in his cities. It gives him an asymmetrical advantage.

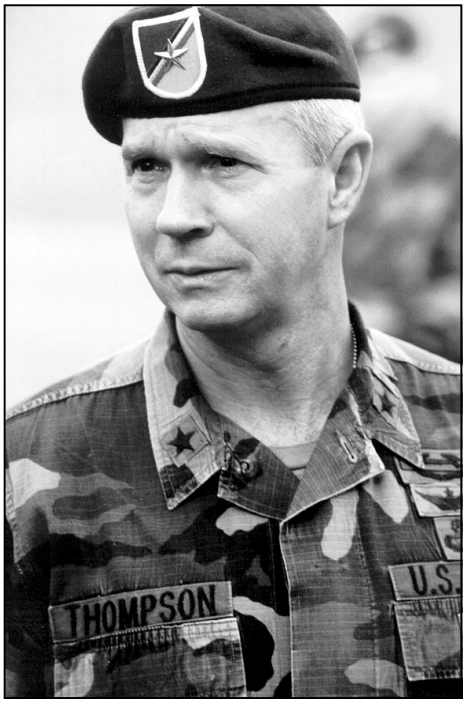
And he's *not* going to let the brigade waltz up to a city and conduct a breach. He's going to have combat outposts out to give him early warning of the brigade's approach, and he's going to try to break up the brigade's formation before it gets to the city—deal as much death and destruction as he can. Fires are crucial to getting the brigade to the city, and Field Artillerymen must be ready to fire and provide fire support throughout the entire process.

Then inside the city, the brigade needs ground-based precision-guided munitions that can penetrate concrete. The ground commander needs to be able to say, "Take out the upper right quadrant of that three-story building." And the FA needs to take out *just* that quadrant because of the ROE [rules of engagement]. It doesn't do the American Army any good to turn back rubble instead of a city to the local government after we've won.

Copperhead doesn't work in the city. So the commander has to use Hellfire or call in CAS. Right now, units must depend on aviation—but that means they also depend on fuel, crew rest, aircraft availability, etc. As a JRTC teacher, coach and mentor, I've encouraged units not to develop plans that *depend* on aviation—just have those assets as additives to the battle. They need plans that will work if the weather turns bad—and that calls for an all-weather FA precision-guided munition.

Q *If you could teach the maneuver commander one principle or train him on one technique that would significantly improve his fire support on the light force battlefield, what would that be?*

A That's something we've been talking about—teach him to communicate. He has to think his way through what he wants his guidance to be and talk in terms of task and purpose, keeping it simple. He has to clearly tell his fire supporter exactly what effects he wants to achieve. He must clearly convey his task and purpose to everyone at every level so they're on his sheet of music.



"One of the things you learn as a brigade commander is that if you don't have a team, you don't have anything."

Maneuver commanders generally don't do that very well. We've got some of the smartest folks in the world doing that, but usually for the first time.

There's an interesting phenomenon that occurs during the military decision-making process. Rarely does anyone question the brigade commander about what he means—"Do I have it right, Boss?"

The brigade commander gives his guidance, issues his orders and conducts a rehearsal. Meanwhile, his battalion commanders are all giving him the head nod: "Yes, Sir, we got it. Got it. Got it." Well, you know what? Normally, they only "got" about 50 to 75 percent of it.

Brigade commanders can conduct a mini-series of briefbacks—"Okay, I just gave you my order. Take 15 minutes to think and brief me on it." That's priceless in terms of combat value. The commander must dialog with his subordinate commanders about the details and the "what ifs" throughout the military decision-making process.

And if you asked me the same question about what I'd teach Field Artillerymen at all levels to improve fire support, I'd say the same thing: establish a relationship with your maneuver commander. Do PT [physical training] with him. Fish and hunt or play golf with him—learn how he thinks. Special intangible benefits come out of knowing how each other thinks and developing the comfort to dialog in depth.

One of the things you learn as a brigade commander is that if you don't have a team, you don't have anything.

Q *What message would you like to send Field Artillerymen stationed around the world?*

A America's Army is in great shape. One of the reasons it's in such good shape is because we have soldiers and leaders, such as those in the 13-series, putting their hearts and souls into warfighting.

You are part of the team. The artillery brings an absolute essence to the battlefield that the team can't do without, just as aviation does. But we cannot think of ourselves in any other way except as a maneuver team. And so the degree to which we all buy into the team concept dictates our success.

Brigadier General (Retired) Samuel S. Thompson III, until recently, commanded the Joint Readiness Training Center and Fort Polk in Louisiana. Currently, he works for Vinnell Corporation in Saudi Arabia training the Saudi Arabian National Guard. Among other assignments, Brigadier General Thompson served as Assistant Division Commander for Operations for the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky; Chief of Staff of the 25th Infantry Division (Light), Schofield Barracks, Hawaii; and Commander of the Operations Group at the Joint Readiness Training Center. He also commanded the 2d Brigade, 25th Infantry Division, and the 2d Battalion, 1st Infantry of the 9th Infantry Division, Fort Lewis, Washington. He served three tours in Vietnam as an NCO. Brigadier General Thompson holds a Master of Arts in Business Management from Central Michigan University.

AFATDS UPDATE

Sustainment Training

Since its initial fielding to the 1st Cavalry Division at Fort Hood, Texas, in 1996, training for the advanced Field Artillery tactical data system (AFATDS) has been one of the most challenging tasks for the FA. Like its predecessors, the tactical fire direction system (TACFIRE) and the initial fire support automation system (IFSAS), AFATDS requires initial and unit sustainment training backed up with a solid maintenance program.

The questions asked by every fielded unit are "How much sustainment training is enough?" and "What training products are out there to help us?" To answer these questions, the Training Doctrine (TRADOC) System Manager-Field Artillery Tactical Data Systems (TSM-FATDS) at Fort Sill, Oklahoma, developed a training branch in 1999. (Until recently, the office was known as TSM-AFATDS; it now manages all digital command and control systems, including IFSAS, and has been renamed TSM-FATDS.)

Sustainment Training. TSM-FATDS advocates 16 hours of sustainment training per week. This is just a goal, but TACFIRE park training taught us it took dedicated Military Occupational Specialty (MOS) 13C Tactical Fire Direction Specialist NCOs and consistent weekly training to succeed with TACFIRE. AFATDS is no different.

Although AFATDS is substantially more advanced than TACFIRE, the operator must know every nuance of the computer to fight with the system in combat. This level of operator proficiency can be accomplished only with command emphasis and scheduled training, such as the TACFIRE park training of old.

Additionally, AFATDS is a *fire support* system, not a Field Artillery system. Operators and leaders must understand fire support to correctly use the computer to its full potential. Sustainment training must include leaders' and soldiers' reviewing the FM 6-20 series of manuals.

AFATDS Training Products. TSM-FATDS, in conjunction with the Program Manager-FATDS (PM-FATDS), has developed a training CD-ROM for new AFATDS software (A98). This CD becomes available in April.

One CD will be issued to every student in AFATDS new equipment training (NET) or in one of the AFATDS courses and the FA Pre-Command Course (PCC). Additionally, copies will be distributed to units already fielded AFATDS.

The CD will have tutorial and test modes, allowing a soldier to first learn and then assess his proficiency on a specific individual task. The CD also will help in NET and individual sustainment training for Army National Guard (ARNG) units that begin fielding AFATDS in FY01. PM-FATDS is funded to develop an updated training CD-ROM for every subsequent software version of AFATDS.

Beginning in FY01, the US Marine Corps (USMC) and Army will develop a training CD jointly. This CD will leverage USMC and Army funding and knowledge to develop computer-based training for AFATDS users. Currently, the USMC is developing its own AFATDS 98 training CD.

Training Products Under Development. TSM-FATDS is developing the fire support digital sustainment trainer (FSDST). FSDST will provide AFATDS-equipped units with a Level I (individual) and Level II (crew/staff section) simulation/stimulation device for unit sustainment training. The device will simulate fire support sustainment training and stimulate Army battle command system (ABCS) inter-device training (horizontal tasks) at the battalion, division artillery (Div Arty) and FA brigade levels.

The focus of the FSDST training will be on battalion fire support tasks. The FSDST will use the current AFATDS hardware, providing individual and collective sustainment training without substantial preparation time or additional equipment. The device will include a robust after-action review (AAR) capability that provides a comprehensive snapshot of unit training strengths and weaknesses.

FSDST is scheduled to start fielding to active FA battalions with AFATDS in late FY01. Eventually, FSDST will replace the current AFATDS training device, called the simulation/stimulation training device (SISTIM). It also eventually will replace the digital systems test and training simulator (DSTATS) in IFSAS-, battery computer system (BCS)- and forward observer system (FOS)-equipped units. FSDST will require NET training for each unit fielded, primarily to teach soldiers how to generate training scenarios.

The Field Artillery School's Warfighting Integration and Development Directorate (WIDD) is developing a series of Internet-based training support packages (TSPs), including TSPs for AFATDS sustainment training. The TSPs will be down-loadable from the Fort Sill WIDD home page, starting in the fourth quarter of this FY.

In addition, WIDD is developing TSPs for the new MOS 13D FATDS Specialist individual tasks. The 13D Skill Level 10 TSP will be available for down-loading in FY01 and 13D Skill Levels 30 and 40 in FY02.

AFATDS sustainment training will continue to be a challenge, given the operational tempo (OPTEMPO) of the Army and the Marine Corps, but help is on the way. But first, AFATDS-equipped units must allocate time to train on AFATDS. Given the new devices and training aids and a little command emphasis, our capable 13-series NCOs again will succeed in making digital fire support work for the Field Artillery.

If units have questions about AFATDS or other digital command and control systems, call TSM-FATDS at DSN 639-1029/6836 or (580) 442-1029/6836. Units also may call the Tactical Software 24-Hour Hotline at (580) 442-5607 for assistance. (For additional numbers, see the figure.) The office is located on the second floor of Knox Hall, Building 700, at Fort Sill.

MAJ Alford J. Williams, FA
Requirements Officer
Thomas D. Bradford
Training Developer
TSM-FATDS, Fort Sill, OK

- Army Battle Command Systems (ABCS) Integration: 5788
- Initial Fire Support Automation System (IFSAS): 5607
- Battery Computer System (BCS)/Cannons: 4867
- Multiple-Launch Rocket System (MLRS): 6851
- Crusader: 6067
- Forward Observer System (FOS): 6481

TSM-FATDS Telephone Numbers:
DSN 639-XXXX or (580) 442-XXXX

Training for the NTC

by Lieutenant Colonel
Gary H. Cheek

The FA is the King of Battle—the greatest killer on the battlefield. Yet at the National Training Center (NTC), Fort Irwin, California, devastating fires do not dominate the battlefield. Is it because the NTC doesn't replicate fires properly—Field Artillery doesn't get credit for the lethality of its fires? Perhaps fire markers are late and don't properly replicate the shock and concussion of artillery? Maybe the systems area weapons effects (SAWE) system doesn't work? Does the opposing force (OPFOR) have too many unfair advantages?

While each of these questions can be answered "Yes" with a grain of truth, in reality the answers are excuses. The real reason FA units don't reach their potential at the NTC is that home-station training doesn't adequately prepare them for the world-class OPFOR at the NTC—and for combat as well.

This article examines some of the shortfalls of fire support at the NTC and offers some ideas for increasing the effectiveness of home-station training in preparation for a deployment to the "Republic of Mojavia." Better home-station training will translate into better performance on the NTC battlefield and, more importantly, a greater training experience for soldiers and leaders.

Maneuver Commander's Guidance and the Essential Fire Support Tasks (EFSTs). In every mission, this is where successful integration of fire support begins. At the conclusion of the mission analysis briefing, the maneuver commander provides guidance on where and when to apply fires and what fires must achieve. From this guidance, units develop EFSTs. During battles at the NTC, observer/controllers (O/Cs) typically see five or more brigade EFSTs, and O/Cs have seen as many as 19. Contrast this with our maneuver brothers who, in their mission analysis, generally extract one essential task—perhaps two—with an on-order mission.

With high numbers of EFSTs, an FA unit loses focus, violates the principles of mass and simplicity and ultimately accomplishes few, if any, of its "essential tasks" to standard.

Why does this happen? The FA has developed a cookbook of EFSTs that apply to every mission without emphasizing the tasks crucial to maneuver success from our maneuver commander's guidance. In essence, *everything* has become essential and that, unfortunately, makes *nothing* essential.

The Fix. Maneuver commanders should use doctrinal references, such as *TC 6-71 The Fire Support Handbook for the Maneuver Commander* and *FM 101-5 Organization and Operations (1997),* to format and present their guidance for fire support. This will help determine the EFSTs: those tasks that, if not accomplished, will require a change to the scheme of maneuver.

Using this definition as the "litmus test" during home-station training, the fire support coordinator (FSCOORD) can derive one or two EFSTs focused on the maneuver commander's decisive points on the battlefield. Other tasks become simply "fire support tasks." This allows the FSCOORD to focus on the task(s) that are *truly* essential for accomplishing the maneuver mission yet address the other required tasks in the scheme of fires.

Targeting the Enemy. At the NTC, Field Artillerymen simply do not see the enemy in time, space and terrain. As with any enemy, the OPFOR at the NTC has patterns to his operations; understanding how he fights allows units to attack his vulnerabilities.

For example, when out of contact, an OPFOR motorized rifle battalion (MRB) typically travels in a column on trails with a formation extending from three to five kilometers. This road-bound enemy presents a great opportunity to destroy him in constrictive terrain by attacking groups of linear targets in formation. Unfortunately, O/Cs at the NTC have yet to see him successfully attacked in such a manner.

Why? Without training at home-station on enemy organizations and how he uses terrain, FA units are not agile enough to apply targeting lessons newly learned during a single NTC rotation to achieve success.

The Fix. Units should study the NTC terrain and OPFOR just as they would any theater of operations to which they were deploying. Then they should go a step further with a map exercise (MAPEX) for fire support personnel that requires them to target a Mojavia area of operations for attack, defense and movement-to-contact.

The MAPEX trains fire supporters on the entire fires planning and execution processes. The brigade fire support officer (FSO) and targeting officer plan targets throughout the brigade area of operations, using satellite imagery of terrain and extracting eight-digit grids using a plotting square. The task force FSOs refine those targets in the task force zones or sectors in accordance with a task force scheme of maneuver—to the same eight-digit level of fidelity. The S2 role-plays the OPFOR with a time and space model (not just an

icon) of the enemy moving through terrain. The FSCOORD evaluates the results, and leaders apply the lessons learned to the unit standing operating procedures (SOP).

If the MAPEX reflects a versatile, highly mobile OPFOR who uses terrain for cover, concealment and positional advantage, then the unit will start its NTC campaign ready to take targeting to the next level and destroy the enemy.

Observation Planning. Essential to unit targeting is a sound observation plan to initiate the fires that ultimately will destroy the enemy. Placed at the proper vantage point, an observer can direct fires on the OPFOR by taking advantage of terrain, obstacles and his knowledge of OPFOR doctrine.

Yet, O/Cs seldom see this happen. Why? There's a lack of effective observation plans at both the brigade and task force levels. At the brigade level, O/Cs often see combat observation lasing teams (COLTs) positioned to support intelligence requirements—observing wide open battlespace vice areas where terrain offers lucrative target areas.

Task force FSOs tend to decentralize observation plans, allowing company FSOs to select their own observation posts (OPs) or remain with the company commander to coordinate fires for the company. At best, the company FSOs are given targets to observe but no direct guidance as to where to position themselves. The unfortunate result is that observers focused on supporting the company often are unable to see the targets essential to the task force.

This decentralized approach leaves gaps in observation of the task force and brigade battlespace, allowing the OPFOR to use terrain with impunity from indirect fire. This contrasts with the OPFOR who positions observers throughout the depth of his battlespace and does not consider them in position until their communications are operational.

The Fix. After completing the targeting MAPEX, the brigade and task force FSOs create centralized observation plans to support their targets. They use terrabase software to validate observation planning of targets and triggers as well as communications back to the controlling headquarters.

Each observation plan should include the fundamentals as follows: observation in depth, the ability to transition fires from the brigade observers to the task force observers and OPs placed to see the target (not just to observe open battlespace where target location is difficult and target attack is generally ineffective). In the defense, the observation plan should provide observation forward and behind defensive positions and redundant observation of EFSTs. In the offense, the observation plan should provide bounding OPs and the use of brigade observers to initiate missions for the task force while company FSOs are moving.

Units should consider where OPs should be mounted or dismounted. Again, the FSCOORD provides the senior oversight and integrates the lessons learned into the unit SOP.

Fire Support Triggers. With observers in place and targets based on the enemy and terrain, units still need triggers to execute these events at the appropriate time. Many times the OPFOR will pass directly over planned targets without being engaged.

Observers often initiate fires on targets without using triggers. In both cases, the results are the same: fires that are late or not executed. Why? Units don't understand fire support triggers and don't enforce their SOPs for marking and executing targets.

The Fix for Defense. The key to defensive fires is the two-trigger process to attack a moving enemy. Using classroom instruction, units should teach observers to use a tactical trigger to initiate an "At My Command"/"Do Not Load" mission and a technical trigger to execute the mission as the enemy closes to within round time-of-flight distance of the target. (See Figure 1.) Units should practice executing triggers against moving targets using Janus simulations to allow observers to learn the mechanics of the procedures.

Next, units should design and build day and night trigger marking kits for all observers and add them to section hand receipts, making sure the sections deploy with them. Finally, and most importantly, units need to execute a tactical exercise without troops (TEWT) or field training exercise (FTX) and have observers emplace triggers and execute fires against a moving enemy in both daytime and nighttime.

The Fix for the Attack. In offensive operations, most fire support triggers are based on friendly maneuver events. For example, when a task force closes to within 1,000 meters of enemy direct fire range, this could be the trigger to initiate obscuration and suppressive fires. As the task force closes to within 1,000 meters of a target, it could trigger

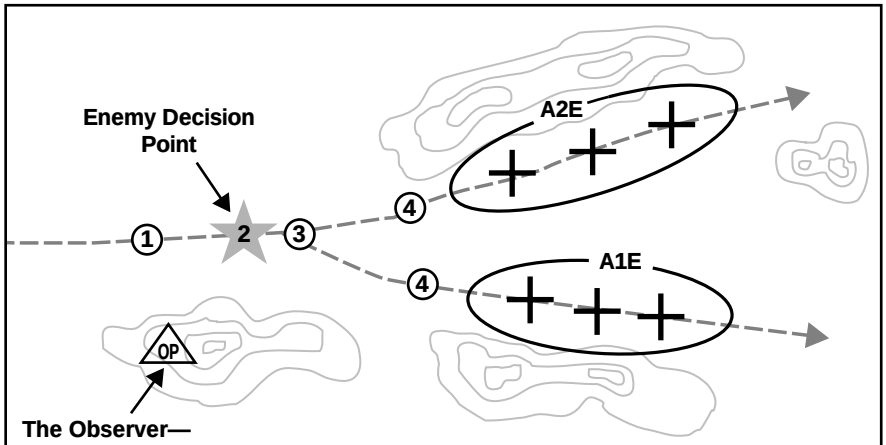


Figure 1: Attacking a Moving Target. Anticipation and tactical patience are key. In this example, the observer reports the enemy approaching and keys the fire support coordinator (FSCOORD) to establish A1E as a priority target. Once the observer confirms the enemy route of march, he either sends a situation report (SITREP) update or changes to A2E. As the enemy approaches within round time-of-flight distance to the target group, the observer commands the guns to fire. This two-trigger method uses a *tactical trigger* to initiate the call-for-fire and a *technical trigger* to fire the target.

a shift in 155-mm fires to suppress deep targets and initiate 120-mm mortar fires. The key is to have triggers to initiate and end missions based on friendly maneuver events and the successful completion of fire support tasks.

Trigger Users. Who uses triggers? Perhaps most important to solving the problem is defining who uses triggers in executing a scheme of fires. It is arguably the FSCOORD who uses triggers the most. By monitoring triggers, the FSCOORD can orchestrate the scheme of fires and ensure fires stay tied to the scheme of maneuver. The FSCOORD also should have triggers for shifting priority-of-fires and transitioning fires from deep to close.

In sum, triggers allow the FSCOORD to anticipate requirements and prepare batteries for upcoming fire support tasks while firing the current task. The results are a reduction in idle gun time and the continuous engagement of the enemy with fires throughout the depth of the battlespace.

Target Location Error. Field Artillerymen tend to believe they can fire-for-effect and deliver devastating results on any enemy. Using a precision lightweight global positioning system receiver (PLGR) with FOM-1 software accuracy for OP location, north-seeking gyro (NSG) for direction, a ground/vehicular laser locator designator (G/VLLD) for distance and direction, and a forward entry device (FED) or handheld terminal unit (HTU) for computation of grid coordinates, units can obtain excellent target location—well within the 250 meters for target effects at the NTC. As a backup, units can use a mini eye-safe laser infrared observation set (MELIOS) with the compass/vertical angle measurement (C/VAM) and a PLGR to obtain quality grid locations.

Yet, in excess of 80 percent of fire missions at the NTC are ineffective because of target location. Why? First, FA units seldom see themselves in terms of the readiness of their equipment and the level of fire support soldier training. The complexity of the fire support soldier's equipment makes it very vulnerable to discharged batteries; cables missing or broken; communications security (COMSEC) or declination constants not applied; not-mission-capable (NMC) components, such as a targeting head and NSG; or poor crew drill. All result in slow or inaccurate target locations.

FA units also have a propensity to fire-for-effect against virtually every spot report. Every rotation since July 1999 has included fires-for-effect on targets with four-digit grid accuracy. The spot-report mission is generally one kilometer off—not just inaccurate, but often at risk for fratricide as well.

In one example in a recent rotation, an engineer scout team closed within 500 meters of an enemy position. COLT 4, attempting to engage the enemy and unaware of the engineer scouts, called for fire. The task force tactical operations center (TOC) had not established a no-fire area (NFA) around the scout team, and because the team was beyond the coordinated fire line (CFL), the target was assumed clear. Poor target location and lack of situational awareness resulted in friendly fire "casualties."

Much of the blame lies in our simulation training where soldiers have learned to fire-for-effect in Janus, corps battle simulation (CBS) and brigade/battalion battle simulation (BBS) with target locations only the click of a mouse away.

The Fix. At home station, we need to create a targeting range where observers must locate targets within 100 meters using each of their acquisition devices. Leaders should time them with a stopwatch. While most will do well with a fully mission-capable fire support team vehicle (FISTV), they do less well with a MELIOS and PLGR without practice and good crew drill.

Units should set real-world conditions in their training. Observers should acquire and process targets on the move and call-for-fire with degraded devices—especially using the dismounted G/VLLD and compass orientation. When observers go through such rigors, they'll find out why target location is so tough at the NTC and why so many missions are ineffective.

Also, units should certify their maneuver shooters—particularly scouts. Units should "boresight" their equipment upon arrival in theater to ensure all observers can provide the eight-digit quality grid as advertised. And above all, maneuver shooters must know that adjustment, refinement and battle damage assessment (BDA) are essential to accomplishing any fire support task—essential or otherwise.

Engagement Area (EA) Development. In our EAs, units can have great success with fires as they integrate indirect fire with obstacles and direct fire. (See Figure 2.) While they often achieve suppressive effects, they seldom achieve killing effects with EA fires. Why? FA unit shortfalls are related directly to previous topics: targeting, observation planning, triggers and target location.

The Fix. Units should build an EA at home station as part of a combined arms training event. In evaluating fire support in the EA, consider the following. In targeting, units need to understand how the enemy fights. He won't blunder into the center of an EA exposed to weapon systems. Rather, he'll use terrain for cover and concealment, plan his breach at the anchor point of the obstacle and overwatch his breaching force with anti-tank (AT-5) fires.

To be effective, units must plot targets at obstacle anchor points and use a PLGR to determine grid coordinates. They should look for intervisibility lines outside the EA where the enemy would employ AT-5s and plan targets there as well.

Units must plan targets or groups for each enemy course of action (COA), giving themselves the flexibility to react to a versatile enemy—not just plan one target. They should emplace tactical and technical triggers for each contingency and select OPs that can see targets and triggers. Then units need to drive the EA with a vehicle to validate OPs and triggers and adjust-in the targets to validate target locations and to allow observers to see where the fires are. And above all, task force FSOs must inspect the OPs and rehearse the plan with contingencies for each enemy COA. These procedures should be part of unit SOPs.

Fire Support Coordination Measures (FSCMs). FSCMs provide force protection from fratricide and expedite fires by allowing rapid clearance at all levels. Our doctrine is simple enough, and automation allows us to quickly transmit and update FSCMs throughout the force. Yet, units struggle to keep FSCMs current and consistent in all fire support elements (FSEs) and fire direction centers (FDCs).

Why? At the NTC, FSCMs management is no small task; there are approximately 40 standing FSCMs before the brigade establishes its first FSCMs. Units also don't use digital systems to their greatest potential; but, in the case of the initial fire support automated system (IFSAS), the system can't store the number of NFAs common to an NTC battle. As a result, units use voice or plain-text messages and attempt to keep FSCMs current using a "snapshot" technique instead of a system.

For example, units disseminate all active FSCMs one hour before crossing

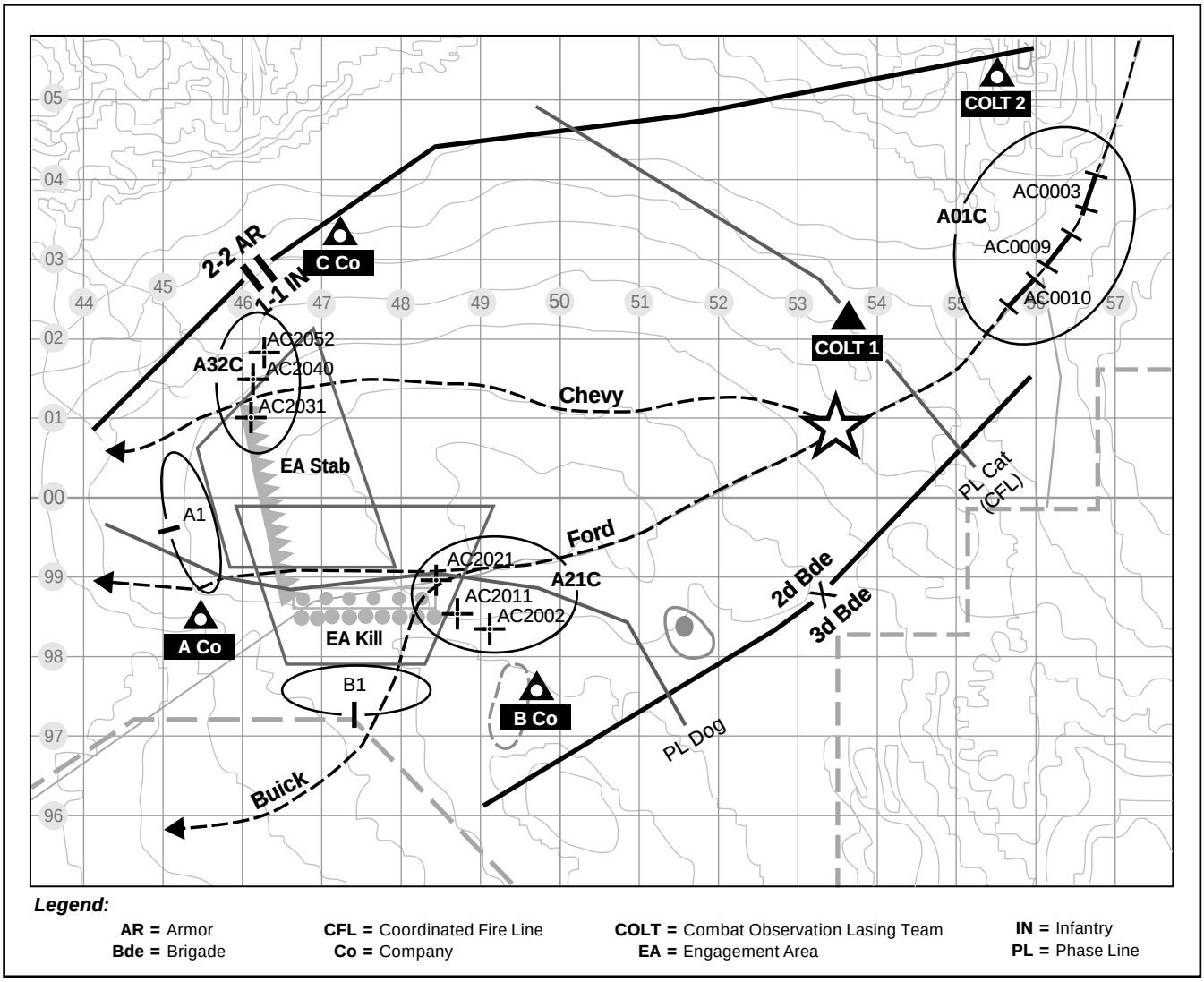


Figure 2: Putting It Together—Integrating Enemy Doctrine, Terrain, Direct Fire, Obstacles, Indirect Fire and Observation. In this example, COLT 2 will fire target group A01C against a column of enemy vehicles in constricted terrain using multiple-launch rocket system (MLRS) as a primary shooter. COLT 1 will provide backup observation for A01C with a primary responsibility for reporting where the enemy will attack: Axis Chevy or Ford. His report will determine which target group the direct support (DS) battalion will lay on. Groups A32C and A21C are tied to anchor points of obstacles (most likely breach points) and terrain. The task of each target group is to turn the enemy into the center of the engagement areas. Note that company fire support officers (FSOs) are in positions outside the company battle positions where they can best observe their target responsibilities. Although C Company is in reserve, the task force FSO has positioned his fire support team (FIST) to provide observation in depth.

the line of departure (LD) and expect all subordinate units to be current for the upcoming battle. FSCM changes are broadcast on the brigade fire support net. The result is widely inconsistent FSCMs in the various FSEs and FDCs and great confusion as to which of the FSCMs are still valid from the last battle and who got the last change.

By the time units reach the live-fire stage, this becomes even more crucial; the NTC will not allow any unit to live-fire until all FSCMs are correctly posted in mortar and Field Artillery FDCs.

The Fix. First, units must integrate 30-plus FSCMs into home-station training events to include every live-fire exercise conducted. The FSCMs should be realisticly portrayed with continuous updates—deletions, additions and refinements. Second, units should devise a system that requires confirmation that subordinate units have applied FSCM changes to their maps. For example, the platoon FDCs report to the battalion FDC when they have applied an FSCM change. Once all platoons have confirmed application, the battalion FDC reports to the brigade FSE that the direct support (DS) battalion has completed the action.

The brigade FSE, task force FSEs and the battalion FDC need to maintain a chart not only showing effective FSCMs, but also the status of each FSCM at each subordinate unit. Finally, the unit should establish check times to verify everyone is on track. Again, these procedures need to be part of the unit SOP.

The SOP. At the NTC, O/Cs read unit SOPs to ensure they understand how each operates. Units have written many excellent SOPs with effective methods for accomplishing tactical tasks. However, O/Cs often see units operating outside their SOPs, usually with unfortunate results. Had the units followed their SOPs, they would have had much greater success. Why don't units follow their SOPs? The bottom line is they're unfamiliar with their own SOPs.

The Fix. All unit leaders—officers and NCOs—should have to pass a test on the unit SOP as part of a semi-annual requirement, much like firing safety tests. There would be different tests for different specialties, focusing on those areas most important to that leader. The tests should have tactical problems that require the leader to combine doctrinal knowledge with the SOP to obtain answers.

The Reinforcing Battalion. The NTC is one of the few places where DS battalions actually train with a reinforcing artillery battalion. FA doctrine lays out the seven inherent responsibilities for FA battalions, to include the responsibilities of DS battalions to position and fire reinforcing battalions as well as coordinate logistical support.

Yet, DS battalions violate the doctrine: they don't plan position areas (PAs), don't direct movement and, many times, don't control the fires of the reinforcing units. The result is a lack of synchronization, lack of mass and poor terrain management. Ultimately, our maneuver force pays the price for the lack of integrated fire support and a subsequent loss of combat power.

Why? The rapid battle rhythm of the NTC overmatches our leaders' abilities to execute the decision-making process. DS and reinforcing battalion leaders decide to conduct separate military decision-making processes (MDMPs), using junior officer liaisons to represent the reinforcing battalion in the DS TOC. In this process, the DS battalion abdicates its doctrinal responsibilities and produces orders with blank spaces for instructions to the reinforcing battalion and a handshake agreement to "handle counterfire." The reinforcing battalion, in essence, becomes a free agent for the brigade.

The Fix. The DS FA battalion needs to integrate the reinforcing battalion into train-up exercises for the NTC. It needs to establish a joint orders process where the two headquarters produce one of everything—one series of briefings, one FA support plan (FASP), one series of FA rehearsals.

The DS battalion should have an SOP for passing missions from the DS battalion FDC to the reinforcing battalion FDC and for massing the two battalions. As part of the SOP, the DS battalion should determine what missions the reinforcing unit will execute independently (for example, counterfire). The DS battalion must ensure the capabilities and limitations of the weapon system the reinforcing battalion brings to the brigade are understood. The multiple-launch rocket system (MLRS) is much different than Paladin, as is the M198 or M119.

Paladin Battery Movement. Paladin provides capabilities unlike any cannon system in the world. It can move rapidly, set and fire within minutes, disperse and use terrain to survive without considerations for line-of-sight optics. It can fire and move to mitigate enemy counterfire and stay closely tied to a moving maneuver force, providing continuous fire support. Yet, O/Cs typically see battalions use single PAs for entire battalions that restrict survivability movement and present lucrative counterfire targets for the enemy.

In offensive operations, Paladins too often remain tied to PAs rather than the maneuver force they support. The Paladins become desynchronized with maneuver: sometimes they lead the attack and other times they are out of range when needed most.

The Fix. During home-station training, FA units always should coordinate with maneuver for terrain. Even on a battalion FTX, the battalion should call a maneuver S3 and coordinate terrain during wargaming process to exercise proper procedures and build relationships with maneuver units.

At home station, leaders should insist on participating in maneuver lane training, ensuring Paladin batteries stay tied in with maneuver units and move through breaches, etc. Battery commanders need to coordinate with maneuver units and use gunnery sergeants to provide liaison for movement to keep the battery in position. The NTC should not be the first time the battalion meets the other leaders in the brigade.

Crew Drill. In FY99, O/Cs saw a number of firing incidents caused equally by fire direction and howitzer errors. These included the same FA errors O/Cs have seen for years: charge errors, fuze setting errors, deflection and quadrant errors, transposed numbers, incorrect target altitude and improper M825 smoke workaround procedures. Many howitzers and FDCs have been placed in "checkfire" status for violating doctrinal crew drill procedures.

Why? Part of the reason is the volume of fire units process at the NTC, both in force-on-force and live fire. Units also fire multiple shell-fuze combinations and various charges from the same location and routinely operate with degraded systems: digital communications out, voice relay of data, broken printers, Paladin sub-systems degraded, etc. All these place a premium on proper crew drill and systemic secondary checks.

The Fix. First, units must establish a rigorous section certification program and award the best sections—most battalions are already doing this.

Second, the FSCOORD and the command sergeant major (CSM) should observe every gun section and FDC process a live-fire mission during routine training. They should use stopwatches to make sure the section can execute doctrinal crew drill within its mission training plan (MTP) time standards.

Finally, the howitzer and fire support team (FIST) sections should demonstrate their skills in live fire in degraded operations lanes. If units expect their M109A6 gun sections to fire completely degraded (M109A5 mode) at the NTC, then they should drill them in those skills at home station.

FDCs need to practice platoon operations center (POC) data transfers several times per day and between different batteries. A system of secondary checks will greatly reduce the likelihood of firing incidents.

Units should use the systems the Army provides to keep account of ammunition: the automated fire control system (AFCS) and lightweight computer unit (LCU)/advanced FA tactical data system (AFATDS).

Ammunition Management. Battles are never won with outstanding ammunition management; however, they easily can be lost if ammunition is not on hand when needed. At the NTC, units typically can't maintain accountability of ammunition, project ammunition requirements for missions, requisition ammunition to support the mission or deliver the correct ammunition to the firing batteries on time. As a result, it takes aggressive last-minute leadership to step in and fix the problem before it stops units dead in their tracks.

Many claim the problem is paper ammunition used during force-on-force operations and state they would do better with real ammunition. Yet, when the real bullets come, they do worse—especially with fuzes, square weights, powder lots and shells that weigh 100 pounds.

Why? First, units are challenged to see themselves in ammunition on hand: what's in firing batteries, on palletized load system (PLS) trucks, in the combat trains or in the field trains. Second, units aren't determining the ammunition requirements for fire support tasks during mission analysis to allow their logisticians to begin requisitioning and bringing the ammunition forward.

The Fix. Units need to elevate the level of MDMP to include routinely determining ammunition requirements during mission analysis based on the fire support tasks in the brigade order. Units need to allow for opportunity targets and target re-attack to get a true estimate of ammunition requirements. They also must assess likely ranges to determine powder requirements, allowing the S4 and ammunition platoon to get a head start on ammunition requirements for the upcoming mission. Then units need to refine ammunition projections during the wargaming process.

Second, units should integrate a paper ammunition system into unit training and practice realistic ammunition accountability, resupply and requisitioning during the NTC train-up. Finally, they should use the systems the Army provides to keep account of ammunition: the automated fire control system (AFCS) and lightweight computer unit (LCU)/advanced FA tactical data system (AFATDS).

Simulation Lessons. "Well, it worked in Janus…" O/Cs hear this phrase a lot at the NTC, usually after a battle. Indeed, simulations are how FA units train—even the NTC is a simulation, albeit far more realistic than computer simulations, such as Janus. Just as units must use caution in learning lessons and changing doctrine based on experiences at the NTC, they must be even more careful with the lessons from our computer simulations, such as Janus and BBS.

Fire support works well in Janus and BBS, largely because the greatest challenge units have is just a mouse click away—and every soldier on the battlefield can get the same precision in target location. Communications can be as simple as walking to the next room or processing the mission at the same workstation. *Not so* in the real world and *not so* at the NTC.

Other simulations often don't stress the lowest levels of call-for-fire systems, especially for the company FSOs and COLTS. Other simplistic simulations communications systems lead units to use one voice net to execute the scheme of fires—the brigade fire support net. When units bring this one-net system to the NTC and extend it over great distances, add multiple missions, fire support coordination, friction and the huge challenges that face the company FSOs and COLTs, their one-net system becomes an albatross too heavy to fly.

The Fix. First, trainers must insist on friction during simulation exercises. Units can set up their doctrinal fire support nets and exercise them and their SOPs. Trainers must not allow the "clicking grids" or targets shown on screens. They must introduce friction and multiple activities into the exercise.

If units plan to "execute voice," as every unit has for the past six months, then each must look at how to make that happen on one net. It must consider decentralizing certain tasks onto other nets, such as counterfire, suppression of enemy air defenses (SEAD), close air support (CAS) marking, Copperhead and smoke. By moving those missions to other nets (for example, a platoon net for Copperhead), the unit increases its ability to allow for observer adjustment and clear the brigade fire support net for mass missions and EFSTs.

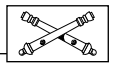
FSCOORD Training. Who trains the FSCOORD? The FSCOORD has no school that teaches him how to orchestrate a scheme of fires for a brigade combat team (BCT). The art of his job is to visualize the battlefield and prepare the DS and reinforcing battalions for one or more fire support events while executing another. He crosstalks with the brigade and task force FSOs to monitor events and sets the stage for event execution and transition of fires from deep to close and from task force to task force.

When he asks the battalion fire direction officer (FDO), "What is the focus of fires?" or monitors a net filled with opportunity calls-for-fire actioned without priority, then he is not an artist, just a spectator.

The Fix: The FSCOORD must be part of the train-up. An O/C can provide feedback on his execution of the brigade scheme of fires. The division artillery commander can teach and train the FSCOORD so the FSCOORD can *practice* his art at the NTC—not *learn* it there. And, yes, the role of the FSCOORD and how he executes a scheme of fires should be part of the unit's SOP.

Effective home-station training makes a huge difference in unit performance at the NTC. In fact, shortfalls in home-station training are the most compelling reasons for limitations on FA unit success against the world-class OPFOR, not the more popular excuses. Most of the training needed is not training-dollar expensive, but it is expensive in both training time and leader energy.

As your fire support O/Cs, we embrace every FA unit that comes to the NTC. Our mission is to develop adaptive units and fire support leaders skilled in the art and science of war. We are committed to the success of fire support and want to sustain the King of Battle in a position of dominance on the NTC battlefield and any other that might include American Redlegs. We look forward to seeing you bring devastating fires on the world-class OPFOR during your next trip to the High Mojave. *Train the Force!*



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Back to the Basics: Training for the JRTC

by Lieutenant Colonel William L. Greer

The Field Artillery battalion is one of the most synergistic units in a brigade combat team (BCT). Its devastating fires can have a truly destructive effect on the enemy when the battalion is synchronized with the other members of the combat team. Within the battalion, the sum of its several individual crews is what produces this devastation—provided the battalion has trained on the basics and can synchronize these crews to provide timely, accurate and massed fires.

The focus of this article is training and certifying crews on basic tasks to ensure that, when their combat team needs them, they are there—trained and ready. The FA battalions coming to the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, that are most successful have crews that know their business.

Units with crews trained to standard in the basic tasks of delivery of fires can and do synchronize their fires on the battlefield. Those that aren't trained to standard in the basics can't bring fires to bear at the critical place and time, no matter how well trained the fire support coordinator (FSCOORD) and his staff or how simple the plan. The FA battalion commander should focus his certification efforts on the company fire support elements (FSEs), battery fire direction centers (FDCs) and howitzer crews. Other crews also need to be certified in the battalion, but most will require external support.

Good NCOs are the foundation of training in units. They train and enforce the standards on the basics of soldiering and leadership. The battalion's master gunner should orchestrate the certification process. But the command sergeant major (CSM), not the master gunner, is ultimately responsible for the battalion's crew certification program.

Company FSE Certification. The first critical element of the delivery of fires team is the company FSE. As the "eyes," they account for a critical and often neglected factor in the delivery of timely and accurate fires—target location. Their performance and credibility with the maneuver commander are directly and unequivocally linked to their skill in bringing fires to the right place on the battlefield at the right time.

Crew certification for a company FSE is perhaps the most complex of the three. Fire support always has some elements of the "art" of providing fires. Young fire supporters want to learn, and just as importantly, they want to show their NCOs and officers how proficient they are at their jobs.

The first component of the program is to ensure fire supporters are proficient at land navigation. This requires establishing land navigation courses for both day and night. The courses should check physical stamina and proficiency with the map and compass.

Units should not allow soldiers to use precision lightweight global positioning system receivers (PLGRs) or other automated navigation aids on these courses—maps and compasses don't run on batteries and are about the only fail-safe method a forward observer (FO) has for navigation. Units should test the FOs' proficiency with PLGRs or other navigational devices, but at a different time. The course should be devoted to training and testing on "manual" land navigation skills.

A second critical task area for fire supporters is communications. Soldiers should know how to operate the single-channel ground and airborne radio system (SINCGARS) and serve as radiotelephone operators (RTOs). At the JRTC, too much information is lost and time consumed in radio transmissions; inexperienced soldiers fail to provide complete information or fail to use proper radio procedures for initiating, answering or ending a transmission.

Units should test and certify soldiers on the use of the automated network control device (ANCD) and other communications devices they may be required to use. The instruction should include the construction and use of field expedient antennas, such as the AT/984G "fishing reel antenna" or the communications wire version of this antenna.

Photo by Raymond A. Barnard, Command Photographer, JRTC, Fort Polk

A third critical skill for the FO is occupation of an observation post (OP), preferably away from the impact area typically used during home-station live-fire events. Units should use an area that is combat realistic—has open areas, buildings, roads, vehicles, etc. Soldiers should draw their own terrain sketches—not use one passed from generation to generation of observers on the impact area OPs. They should use the tools available to FOs: the ground/vehicular laser locator designator (G/VLLD), mini eye-safe laser infrared observation set (MELIOS), PLGR and forward entry device (FED). The FOs also need their skill with automation tools tested and certified. Most of these will be skill-level two tasks, but the focus should remain on the FO team of the company FSE. The battalion should train and test all soldiers below the rank of sergeant who will perform duties as FOs.

The OP is the ideal place to train FOs on establishing trigger points. This critical skill is perhaps the single most prevalent cause of ineffective fires at the JRTC. At the OP site, moving vehicles, on or off road, can test the observer's ability to establish trigger points in both open and close terrain. FOs can work together as a team with one FO focused on the trigger point while another observes the target area. During the training, units should allow the FOs to "figure it out on their own" for each unique situation—as they will at the JRTC or in combat.

FA battalions must train and certify all FOs to skill-level two tasks in calls-for-fire (CFF). The easiest way to do this is by using the guard unit armory device, full-crew interactive simulation trainer (GUARDFIST). One testing technique is for observers to draw missions from a hat and then execute them correctly on the GUARDFIST. Not every observer will get every mission, but the team must be proficient to pass. The benefit is having the *team* succeed or fail, not individuals.

The culminating event for the company FSE training is for fire supporters to develop a company fire support plan through to rehearsal. The supported maneuver company commander must be involved. This gives the more experienced fire supporters at the brigade and battalion levels the opportunity to pass on lessons learned. They also can walk through the battalion's standing operating procedures (SOP) with the company fire supporters and ensure there's a common understanding of the contents and purpose of products such as the fire support execution matrix (FSEM), target synchronization matrix (TSM), etc.

The combat observation lasing teams (COLTs) should be incorporated into the training and certification processes. They require the same skill-set as a company FSE and also must be certified. For the COLTs, the battalion should provide additional training on laser designation and operating as both a mounted and dismounted reconnaissance element.

Under the supervision of the brigade FSO and battalion command sergeant major, the brigade fire support NCO (FSNCO) should direct the company FSEs' certification process. Those company FSEs not certified during training should be retrained and revalidated within a reasonable time.

Battery FDC Certification. The second key component of delivering accurate and timely fires is our gunnery brothers who deal with the science of delivering fires—the FDCs. They are trained under the auspices of the battalion fire direction officer (FDO) and NCO. Part of the FDCs' training and certification is to understand they are a key part of the battalion's ability to mass; therefore, they must be able to respond to and inform the battalion FDC about all issues that affect the accuracy of their batteries' fires.

The battery FDC certification process lends itself to both a written examination and practical application. The written examination ensures FDC members understand the basic elements of gunnery and the manual tools to help achieve the gunnery solution—tabular firing tables (TFTs), graphic firing tables (GFTs) and meteorological (Met) data. Met is a particular area of emphasis because of the dramatic effects it has on the accuracy of fires. FDCs should be tested on the ability to determine Met validity, the use of concurrent and subsequent Met, the calculation of position constants and the use of the eight-direction Met for 6,400-mil operations.

Another area of emphasis for the written examination is calculating terrain-gun position corrections (TGPCs). The written examination should be a *team* event for the FDC—the FDC will succeed or fail as a team in the field.

The majority of emphasis for testing should be on the practical application exercise for the FDC. Crewmembers must be trained and evaluated on all aspects of performing their duties, from occupying a position to displacing. A logical progression of events for the FDC that replicates what is expected upon occupation of a firing position is the best approach. The unit should include advance party operations according to its SOP.

In the firing position, the FDC first establishes communications with higher and lower headquarters and a firing data computation ability. Then it conducts a registration mission with concurrent Met, allowing it to calculate position constants and transfer the registration corrections to another battery.

The battalion should evaluate how quickly and safely the FDC establishes long-range antennas. The process should be a normal part of the occupation of a position—day or night.

Another critical and often overlooked skill is using the M17 plotting board to verify howitzer positions. An early part of occupation priorities for FDCs, part of the tactical SOP (TACSOP), is the plotting of howitzer positions by the battery executive officer (XO) or the FDO. The battery positions are then physically looked over to make sure the data entered into the battery computer system (BCS) is correct.

The battalion should train and certify the FDC's ability to execute fire direction responsibilities in a degraded mode through the use of the backup computer system (BUCS) or manual computation, according to its SOP. The accurate calculation of firing data for all mission training plan (MTP) fire missions is most important.

For special units—airborne or air assault—FDCs must be able to perform in austere environments. Part of the evaluation should include a dismounted FDC with long-range antennas that must rely completely on manual gunnery. The advance party soldiers should be evaluated as part of this process. Advance party skills are critical for the unit to meet time standards.

Airborne and air assault operations must include rigging as part of the section certification. Improperly rigged loads lead to mission failure—no matter how well trained the crew is in other basic tasks.

The training/testing exercise for the battery FDC crew certification should culminate with the calculation and rehearsal of a fire plan, complete with howitzer crews. The norm is multiple-round missions that stretch the gun crews' ability to execute their tasks.

Although the company FSE certification can take place without the benefit of gun crews or FDCs, the firing battery's howitzer crews and FDC should be certified simultaneously on the same firing position.

The majority of a howitzer crew's certification should be the hands-on performance of section duties in a field environment. (Photo by Raymond A. Barnard, Command Photographer, JRTC, Fort Polk)

The battalion fire direction NCO, under the supervision of the battalion FDO and CSM, should direct the certification of battery FDCs. It is critical that those battery FDCs not able to be certified go through the certification process again in a reasonable time.

Getting all FDCs certified may require leaders to realign personnel in the FDCs to balance the expertise. Leaders should remember the FDCs deal with the "science of fires." There is little room for error. FDCs not proficient in their basic skills require a refocused effort throughout the chain of command.

Howitzer Crew Certification. Howitzer crews—the part of the battalion team that actually produces the effects on target—also require training and certification. This component of crew certification has been around the longest and is probably the best understood. Nevertheless, at the JRTC, howitzer crews often are not well trained at delivering fires, occupying and displacing and in providing perimeter security. All these skills are critical, basic skills.

Normally, howitzer crew certification is done in conjunction with FDC certification. This provides an opportunity for the howitzer crew and FDC to demonstrate basic proficiencies in providing timely and accurate fires—written and practical application.

The written examination for the howitzer crew should emphasize maintenance for the howitzer and prime mover, misfire procedures, safety procedures and weapons information (such as maximum cant). The written examination should be given to the entire howitzer crew. The crew should be allowed to use reference material available in the field.

The majority of a howitzer crew's certification should be the hands-on performance of section duties in a field environment. Crews must be trained and evaluated on all tasks from tactical movement to occupation, performing fire missions and displacement (hasty and routine).

Advance party operations are an important part of the certification process. Advance party soldiers must be evaluated on their abilities to perform duties in accordance with the battalion's SOP. Howitzer crew occupation procedures include section standardization and the preparation of hasty fighting positions, complete with range cards, in addition to meeting all MTP standards.

The crews' abilities to process fire missions should be evaluated according to the SOP and MTP, including training aids for fuzes, projectiles and powder charges, enhancing the evaluation process. The process should evaluate direct and indirect fire missions, switching of aiming points for howitzer crews and multiple-round missions. If 10-gauge shotgun shells (or primers for the 155-mm) are available, units can use them to enhance the realism for the crews, particularly with multiple-round missions.

The battalion should certify the chiefs of section, gunners and assistant gunners on the gunner's test, according to *FM 6-50 Tactics, Techniques and Procedures for the Cannon Battery* and the unit SOP. In addition, section chiefs should be certified on the use of the aiming circle—to lay and safe the battery. This training develops future gunnery sergeants and chiefs of firing battery. As technology replaces the aiming circle, the battalion must ensure its chiefs are trained and ready on the newer systems.

For special units required to conduct airborne or air assault operations, certifying howitzer crews in rigging operations is critical. Howitzer crews will not go into battle without their howitzers unless the howitzers can't be brought into the mission area. Crew rigging failures significantly degrade the combat power of the BCT and waste resources. If howitzer crews are certified on nothing else, they must *know* the rigging operations needed to execute air operations.

Certification of Other Crews. Division artillery and FA brigade commanders and CSMs can enhance crew certification. They have the resources to certify crews in many areas that battalions lack. The most critical include radar crews, survey crews, battalion FDCs and battalion FSEs.

It's amazing how far young radar and survey crews grow toward becoming "trained and ready" during a JRTC rotation. This is due to the great NCOs who have two weeks to coach, teach and mentor the radar and survey crews. Div Arty or FA brigade commanders can have the same positive training impact by devoting resources to train and certify these crews before they arrive "in the box."

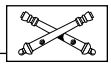
Another area in which the division artilleries and FA brigades can help subordinates is by establishing standards. Standards for crew drill, set up of howitzer positions and FDC/FSE vehicles and trailers all lead to improved performance for inexperienced crews. Standardization—the more the better.

Other Elements. The gunner's test is a great exercise and should be taken by every officer in the battalion during crew certification. All XOs, chiefs of firing battery and gunnery sergeants should take the test for score and time. Crews should be certified semi-annually; however, with a large turnover of personnel in units, this may not be often enough.

Units often will face demands to delay or cancel crew certification because of high operational tempo (OPTEMPO)—*don't* let it happen. In a high OPTEMPO environment, crew certification allows your first-line leaders to focus on what's important—training to standard on the basics.

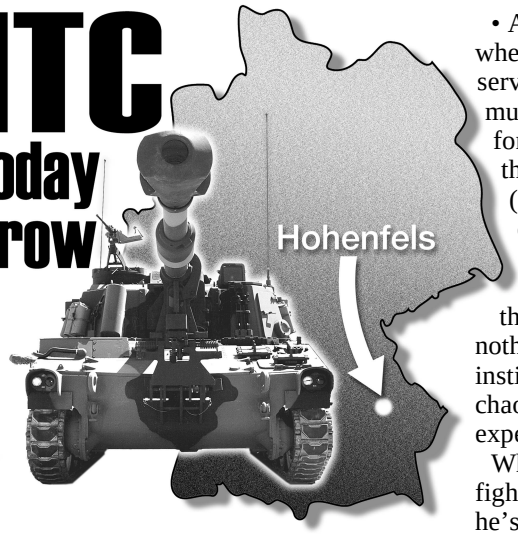
The crew certification process should be fun and rewarding. Every crew must attain the standard, but competition is a strong motivator. Finally, the battalion should emphasize safety as part of crew certification both for efficient operations and force protection.

There is no silver bullet, no magic wand, no words of wisdom, no leader's charisma that can replace trained and ready crews—crews that can deliver devastating fires at the right place and time to achieve the commander's intent. The fire support coordinator (FSCOORD) who has trained his 18 howitzer crews, three firing battery FDCs and nine company FSEs to standard and certifies they're proficient in the basic skills has an opportunity to influence the battle with fires.



Lieutenant Colonel (Promotable) William L. Greer is the Senior Fire Support Observer/Controller (O/C) at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, where he also served as the Senior Brigade Fire Support O/C. He commanded the 3d Battalion, 320th Field Artillery, the direct support battalion for the 3d Brigade (Rakkasans) of the 101st Airborne Division (Air Assault) and served as the Executive Officer (XO) of the 101st Division Artillery at Fort Campbell, Kentucky. He has also commanded C Battery, 3d Battalion, 18th Field Artillery, part of the 17th Field Artillery Brigade, III Corps Artillery, Fort Sill, Oklahoma. Other assignments include serving as Brigade Fire Support Officer and XO of the 2d Battalion, 7th Field Artillery, 10th Mountain Division (Light Infantry), Fort Drum, New York. He is a graduate of the Army War College, Carlisle Barracks, Pennsylvania.

The CMTC
Remaining Relevant Today Preparing for Tomorrow



by Lieutenant Colonel
Donald C. McGraw, Jr.

For those who have never been there, the Combat Maneuver Training Center (CMTC) in Hohenfels, Germany, is an unknown Combat Training Center (CTC). It's neither talked about much nor heard from a lot, and no officer basic or captains career course scenario uses its terrain. But to those who have walked the ground, fought the opposing force (OPFOR)—the 1st Battalion, 4th Infantry—and trained there, it is an experience they never forget.

The CMTC is the youngest and smallest of the three "dirt" CTCs. But it's arguably the most flexible and relevant CTC in operation today—training the entire spectrum of conflict from mid- to high-intensity to stability and support operations (SASO). (See the sidebar "Training at the Combat Maneuver Training Center" on Page 19.)

Due to terrain limitations, one firing battery is "in the box" at a time. The FA battalion tactical operations center (TOC) controls the other batteries with their effects fully replicated by the instrumentation system. Figure 1 shows the FA assets that usually participate in CMTC rotations.

The Vampire Team, the CMTC's fire support observer/controllers (O/Cs), see operations that span the entire spectrum of conflict. The following are a few Vampire Team observations on trends at the CMTC.

Mid- to High-Intensity Operations. In this combat environment, the CMTC fire support trends are similar to those observed at the other dirt CTCs—and none are new.

1. Target Location Error. During execution, the observer's inability to accurately locate targets is the single greatest cause of ineffective mortar and artillery fires at the CMTC. This includes observers from both the fire support teams (FISTs) and maneuver shooters. What should be the unit's "bread and butter" usually is what brings them to their knees. There are four reasons why the units have difficulties with target location errors (TLEs).

• Individuals lack proficiency in relating what they see on the ground to the coordinates on a map. Simply stated, forward observers (FOs), company fire support officers (FSOs) and fire support NCOs do not practice this enough, and when they do, its under conditions different than the CTC or combat.

Accurate target location takes practice—realistic practice. Most observers in Europe get this practice in the impact area of the Grafenwoehr . Unfortunately, observing fires repetitively at Grafenwoehr under sterile conditions—shooting the same hunks of junk over and over again with no OPFOR shooting back—is too easy and not realistic.

Locating a target at the CMTC under near-combat conditions is infinitely more difficult and complex. While observed fire trainers and the guard-unit armory device, full-crew interactive simulation trainer (GUARDFIST) help refine and rehearse call-for-fire procedures, they are no substitute for accurately locating targets in the real world under realistic conditions.

• A dangerous practice is developing where company FISTs cease being observers and concentrate on being "communications platforms," relaying calls-for-fire from maneuver shooters to their task force fire support element (FSE). This practice has significant consequences to the company FSO. He often loses situational awareness of what is truly occurring on the battlefield; and because he sees nothing for himself, he relies on his instincts to make sense of the battlefield chaos—using his one or two years of experience.

When the FISTer hangs back from the fight, he doesn't use the technology he's armed with. The ground/vehicular laser locator designator (G/VLLD) or Hellfire ground support simulator (HGSS) are wasted, the mini eye-safe laser infrared observation set (MELIOS) can't see and the precision lightweight global positioning system receiver (PLGR) is of questionable value.

• Few of our company and task force fire support coordinators appreciate and understand the complexities introduced to fire support operations in close, restrictive terrain. Too often we locate pre-planned targets where we can see, not where we expect the enemy to go. We compromise with the terrain instead of mastering it.

Most importantly, observers rarely can find a position from which one observer can see both the target and the trigger point without interference from hills, forests or defiles. This greatly complicates timely, accurate target engagement.

• Observers and fire support coordinators fail to account for the complexities associated with each target. At the CMTC, O/Cs coach units that have no concept of the complexity of a target by introducing them to the purpose, location, observer, trigger-communication and rehearsal (PLOT-CR) mnemonic.

- Company Fire Support Teams (FISTs)
- Task Force and Brigade Fire Support Elements (FSEs)
- Two Brigade Combat Observation Lasing Teams (COLTs) per Task Force
- One Q-36 Radar
- Direct Support (DS) FA Battalion Tactical Operations Center (TOC)
- One Firing Battery per Task Force Rotation
- DS FA Battalion Combat Trains
- DS FA Battalion Field Trains (-)
- One Multiple-Launch Rocket System (MLRS) Battery Operations Center (BOC)
- One MLRS Platoon

Figure 1: FA Structure in a Typical CMTC Rotation

P - Purpose. What is the target supposed to accomplish?
L - Location. Where is the target?
O - Observer. Who are the primary and backup observers?
T - Trigger. What specifically triggers the target's execution?
C - Communication. What are the primary and backup means of calling in the target?
R - Rehearsal. Have the actual primary and alternate shooters rehearsed the target?

Figure 2: PLOT-CR. This mnemonic reminds the unit of the components of effective target execution.

(See Figure 2.) PLOT-CR is a mechanism for getting a unit to raise the probability of effectively executing a target by accounting for its many components. Units that conscientiously employ PLOT-CR or some other similar operating procedure are consistently more effective with fires than those that just "wing it."

2. Key Task, PIR and EFST Linkage. During planning, the lack of a clear linkage between the key tasks contained in the commander's intent, his priority intelligence requirements (PIRs) and the essential fire support tasks (EFSTs) often torpedoes plans, leaving little chance for success. Key tasks are determined by the maneuver commander and contained in his intent statement. These are tasks that must be performed by the force or conditions that must be met to achieve the stated purpose of the operation.

EFSTs are tasks for fire support to accomplish that are required to support the combined arms operation. Failure to achieve an EFST may require the commander to alter his tactical plan. So defined, at least one EFST also should be a commander's key task.

To support the key tasks and EFSTs, the commander determines his highest PIRs. Hence, all three should be nested and support one another.

Unfortunately, this is rarely the case, and worse, units fail to recognize the disconnects until too far along in the planning and intelligence collection process to recover.

The linkage between these three should start during mission analysis and be continuously refined during mission preparation and even execution. Failure to do so results in the commander, his S2 and the FSO operating from "different sheets of music." While, ultimately, the harmony between these three is the responsibility of the combined arms commander, FSOs (particularly at the task force and brigade levels) can greatly facilitate the process by pressing the issue and ensuring detailed interaction and dialog occurs between the FSO, the S2 and the commander.

3. Task Force Mortar Operations. This is a good-news, bad-news trend. Task forces seem to be doing a good job of incorporating mortars into their overall fire support plans. Mortars are given clear, feasible missions that support the commander's plan. And, more often than not, they are an integral part of most rehearsals.

At the CMTC, the brigade's direct support (DS) artillery battalion rarely receives a reinforcing artillery battalion. Consequently, the importance of a task force's mortars, particularly those of any supporting effort, is that much greater.

On the other hand, while we plan and rehearse well, unit execution of many fundamental mortar tasks needs attention. Units rarely extend survey to mortar platoons, and when they do, the mortars don't use it or don't know how to use it. Mortarmen seldom use redundant checks during laying operations or for computation of firing data. Mortar fire direction centers (FDCs) fail to track fire support coordination measures (FSCMs). Ammunition management is not synchronized with essential tasks assigned to the mortar platoon. The capabilities of the mortar ballistic computer (MBC) are rarely exploited; the MBC normally is used only to compute firing data. Doctrinal and parochial considerations aside, task force FSOs need to be more involved in training mortar crews.

Stability and Support Operations. One aspect of the CMTC that makes it unique and relevant is the conduct of mission rehearsal exercises (MREs) to support a unit's pending deployment for a SASO.

4. Integration and Synchronization of Lethal and Non-Lethal Fire Support Means for SASO. The notion of "targeting" and the conduct of targeting meetings takes on an entirely new meaning during peace support operations. The distinction between what we traditionally think of as targeting and the concept of "information operations" becomes blurred. (See the article "Integrating Targeting and Information Operations in Bosina" by Lieutenant Colonel Steven Curtis, July-August 1998.) Initially, going into a SASO environment, few commanders or fire support coordinators (FSCOORDs) are prepared for this paradigm shift.

Often units start out with traditional targeting meeting agendas. They soon discover that a whole host of additional resources, assets and contributors exists that they never saw during high-intensity combat operations. In the SASO environment, the management, denial and dissemination of information becomes just as important as preparing PLOT-CR for a target.

Commanders and FSCOORDs have help in dealing with these new concepts. Participation by public affairs officers (PAOs), psychological operations (PSYOPS) specialists, special operations forces (SOF), national-level intelligence resource assets and non-governmental agencies (NGOs)—just to name a few—give new meaning to the term "targeting meeting."

All these "information specialists" come together to synchronize their operations with the commander's intent and concept of ongoing operations. This is no easy task. Units must develop new standing operating procedures (SOPs) and integrate these diverse assets into a single battle rhythm that supports the commander's intent. Few units arrive at an MRE prepared for this.

5. New SASO Skills for Artillery Units. No two SASO operations are alike. A unit deploying to Bosnia in the spring of one year and returning to Bosnia late in the next year is likely to return to a completely different environment. The rules of engagement (ROE) would have matured or changed, the conditions under which the unit would operate would be different, and the individual skills and collective tasks the unit had to perform also would be different. Likewise, if the unit had been to Bosnia, the unit faced a completely unique experience going into Kosovo.

Many artillery units deploying to a SASO operation have to learn skills foreign to their traditional mission essential task list (METL). If a unit is lucky enough to take its guns, it is likely

to be conducting more firebase style operations as opposed to spreading Paladins out to ensure survivability. However, instead of conducting reconnaissance, surveillance and target acquisition (RSTA), battery and platoon leadership may find themselves conducting "presence missions" that require them to deal with angry mobs, disgruntled farmers or an illegal checkpoint operated by a former belligerent. The key to preparing for and executing a peace support operation is *flexibility*.

6. Radar and Radar Zone Management for SASO. All facets of radar operations are our success stories. Radar management during peace support operations is vastly different than what units encounter during traditional combat operations. Requirements vary from 24-hour operations with 6,400 mil coverage and extended-range software to highly focused, specific operations designed to monitor the situation during a potentially explosive confrontation. Without exception, Firefinder radar crews and their hardware have been up to the test.

Overall, fire supporters and gunners are doing well at the CMTC. There is plenty for Redlegs to work on, but there always has been and always will be.

Innovative training solutions to many of the negative mid- to high-intensity trends already are being implemented, and soldiers and leaders in US Army Europe continue to improve the mental flexibility required for peace support operations.

Army force structure changes are occurring to accommodate the realities of our emerging and changing missions. To continue preparing our Army to fight its next battles or enforce the next peace, the CTCs also must change. Anticipating these changes and training our forward-deployed forces for *every* contingency is the mission of the Combat Maneuver Training Center—remaining relevant today and preparing for tomorrow.

Lieutenant Colonel (Promotable) Donald C. McGraw, Jr., until recently, was the Senior Fire Support Trainer on the Vampire Team of the Combat Maneuver Training Center, Hohenfels, Germany. Currently, he is a student at the Air Force War College at Maxwell AFB in Alabama. He commanded the 4th Battalion, 41st Field Artillery at Fort Benning, Georgia, which was part of the 24th Infantry Division (Mechanized). In the 1st Infantry Division (Mechanized) at Fort Riley, Kansas, he was the Division Artillery S3, Executive Officer of the 4th Battalion, 5th Field Artillery and Deputy Fire Support Coordinator. He also served as the G3 Plans Officer for the 2d Infantry Division in Korea. Among other schools, he's a graduate of the School for Advanced Military Studies (SAMS), Command and General Staff College, Fort Leavenworth, Kansas.

Training at the Combat Maneuver Training Center

The CMTC at Hohenfels, Germany, is in the Bavarian foothills halfway between Munich and Nuremberg and comprises 156 square kilometers. It contains a wide variety of vegetation and terrain, including restrictive terrain, and five areas for military operations in urban terrain (MOUT). The CMTC also routinely has "civilians" on the battlefield to complete its complex, realistic environment for training.

Task force level operations are the norm, but they always include assets from brigade and division forces; the number of brigade-sized operations being conducted is increasing.

One benefit of a CMTC rotation is the training sequence most units follow. A typical rotation starts with a three-day deployment into the training area. Because the CMTC has no pre-positioned equipment, units rail and convoy their equipment to and from their home stations. The units then conduct focused company-level training (situational training exercises) for five to seven days. Artillery batteries that take advantage of this training time normally concentrate on immediate action drills and platoon collective tasks.

Next, units spend 10 to 14 days fighting the OPFOR in force-on-force training on a complex battlefield that includes urban operations. The unit's parent brigade headquarters runs the training- supported by the CMTC Operations Group with observer/controllers (O/Cs), the OPFOR and the simulated weapons area effects (SAWE) multiple integrated laser engagement system (MILES II).

The CMTC can conduct live and constructive simulation simultaneously. Throughout the training, units receive fully instrumented after-action reviews (AARs), including the company- and battery-level AARs after each mission, with MLRS platoons receiving up to two instrumented AARs per rotation. Training concludes with a three-day redeployment sequence.

The CMTC conducts its share of mid-to-high intensity operations consisting of deliberate/hasty attacks, movements-to-contact and defenses, but it also regularly conducts mission rehearsal exercises (MREs). These specifically tailored rotations are designed to prepare a unit for an upcoming real-world deployment. From 1996 through 1998, 42 percent of all US Army battalions training at the CMTC did so for an MRE.

During an MRE, Hohenfels can be transformed into a mini-Bosnia, Kosovo or almost any other area where the training unit may be deploying. For fire supporters and artillery units, MREs are unique, often requiring mastery of an entirely new set of individual and collective tasks. Equally difficult is a unit's "re-tooling" rotation after a stability and support operation (SASO) to regain its competency at mid-to-high intensity warfighting.

In addition to training US Army units, the CMTC hosts several NATO rotations each year. Some are combined operations with US and allied forces while others only include forces from the visiting country.

The town of Ubungsdorf—the largest MOUT facility at the CMTC.

Fire Support Integration into the CCTT

by Captain Brian A. Cox and
Lieutenant Colonel Jack D. Silvers

CCTT Observer/Controller Station

The close combat tactical trainer (CCTT) is the latest generation of maneuver combat simulators. Both the 1st Cavalry Division and 4th Infantry Division (Mechanized) share the CCTT Facility at Fort Hood, Texas.

The CCTT provides maneuver and, to a certain degree, fire support soldiers the opportunity to train in a virtual reality version of the National Training Center, Fort Irwin, California, and Fort Hood.

The facility opened in September 1996. Similar facilities are at Forts Stewart and Benning, Georgia; Fort Lewis Washington; Fort Knox, Kentucky; Grafenwoehr Training Area, Germany; and Camp Casey, Korea. The CCTT modules include such new features as the open-hatch capability, thermal image sights, the ability to change environmental conditions and the Force XXI Battle Command Brigade and Below ($FBCB^2$) System.

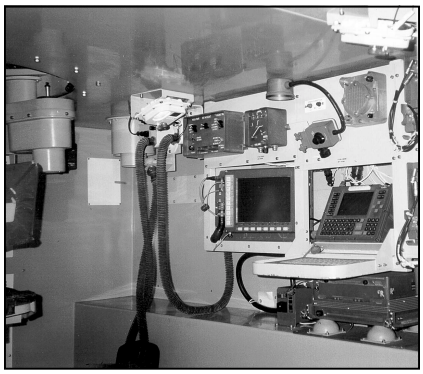
The facility can help train the maneuver battalion staff and company/teams (Co/Tms) in the orders process. The staff can execute the military decision-making process (MDMP) and issue orders to as many as two Co/Tms simultaneously or the key leaders of an entire task force. Accordingly, the CCTT can be used to train fire support integration for the task force level and below.

This article identifies the training the CCTT simulation offers to fire support personnel and suggests workarounds for future users to mitigate training distractions and maximize the training value of the simulator. It examines CCTT fire support capabilities in terms of its three separate but integrated components: one fire support team vehicle (FISTV) simulator, the FA battalion tactical operations center (FABTOC) workstation and the battalion fire support element (FSE) workstation. For a unit to conduct mission-essential task list (METL) training on these stations, operators must receive eight hours of familiarization training and pass a series of gates.

FISTV Simulator. This is a full-sized M981 mock-up that includes standard fire support equipment—a forward entry device (FED), a targeting station control and display (TSCD), a fire support officer's (FSO's) outside periscope and an AN-PSN11 precision lightweight global positioning system receiver (PLGR). The simulator allows one FIST to maneuver a FISTV in a virtual reality version of the NTC and Fort Hood. In spite of the fact the track commander's view is reversed (he commands the driver to turn right to actually turn the vehicle left), the simulator is an effective tool for training the FIST in maneuvering with a Co/Tm through a tactical scenario.

At the company level, the CCTT trains FISTs to plan just as they would in any tactical mission. Company FSOs receive their mission in the task force operations order (OPORD), conduct the eight troop leading procedures and issue the fires portion of the maneuver company OPORD.

Throughout the planning process, company FISTs can train on bottom-up refinement of the scheme of fires. Company FISTs can use the digital platform (FED) to transmit refinements and any other messages in accordance with the



FISTV Simulator Radio-Telephone Operator RTO Station

FABTOC Workstation

unit's tactical standing operating procedure (TACSOP).

The FABTOC. This component consists of a desktop computer installed in an M577 mock-up. The operator does not maneuver in the virtual terrain but manipulates howitzer icons on a desktop monitor to control movement, fire missions, as well as resupply of Class III petroleum, oil and lubricants and Class V ammunition. The CCTT staff can program the station to control up to 16 M109A5 howitzer icons at one time. The desktop computer is equipped with an early version of the advanced FA tactical data system (AFATDS) software, and it may be used for receiving and forwarding digital traffic.

The FABTOC adds training value to the CCTT exercise in several ways. First, the icons appear as howitzers to the maneuver units in the simulation. Consequently, maneuver units see how direct support (DS) artillery maneuvers in support of a given mission (e.g., how artillery follows in support during a movement-to-contact versus how a battery would support a deliberate defense). The FABTOC also provides training for fire supporters in the execution of essential fire support tasks (EFSTs). Maneuver commanders develop a sense of the realistic time lags that exist between calls-for-fire and rounds impacting on a given target.

The Battalion FSE. This workstation is similar to the FABTOC in its makeup (a desktop computer installed into an M577 mock-up). It's adjacent to the engineer M577 mock-up and across from the S2 M577 mock-up in the task force TOC. The FSE workstation receives and forwards calls-for-fire in both the digital and voice modes. The FSE also can monitor the M981's movement throughout the battle and use this knowledge to determine if the FIST is following the task force observation plan. During mission execution, the battalion fire support NCO (FSNCO), targeting officer and assigned soldiers can train on maintaining a focus of fires and battle drills, such as clearance of fires and battle tracking.

FSE Workstation

Battalion FSEs also may use the CCTT as a proving ground for TOC SOPs, such as orders and overlay reproduction and fire support rehearsals. Because the task force can plan and execute an observation plan, the FSE also can train further on synchronizing fires.

Challenges. One challenge is the CCTT Facility has a simulator slot for only one FISTV per task force training. To remedy the shortage, the task force FSO may activate other simulators to operate in the degraded mode. He can employ any combination of the following modules: two dismounted stations, one M113 simulator and two M998 high-mobility multipurpose wheeled vehicle (HMMWV) simulators. The vehicles have to be taken from some other aspect of the CCTT simulation exercise for use as degraded fire support platforms.

None of these degraded stations have the FIST's ground/vehicular laser locator designator (G/VLLD). However, the dismounted and HMMWV stations have simulated binoculars that help the operator maintain eyes forward. One or more combat observation lasing teams (COLTs) can occupy a dismounted station, so a task force can practice receiving targets from the deep (COLT) fight and passing them to the close (FIST) fight.

In CCTT play, the FIST cannot train the entire security, location, observation, communication, targeting and position improvement (SLOCTOP) battle drill. However, it can train on the tenets of sound observation post (OP) occupation. Specifically, a team can determine its location, train on its execution of an observation plan and improve team members' aptitude with the targeting station. Furthermore, teams are challenged to establish and maintain communications as the CCTT is programmed to closely replicate line-of-sight interferences and extensive distances between vehicles.

Finally, the CCTT software needs to be improved to portray the effects of artillery on the battlefield more accurately. For example, a controlled test indicated that fires executed on a known enemy location often resulted in little or no damage to the target. The situation can be rectified through O/C adjudication from the vantage point of an O/C workstation, a method that works at the NTC.

Conclusion. CCTT is a good building block to full task force-level training. As with any simulation, it is not a substitute for task force maneuver training, but it provides a stepping stone to that end. Recently, the 3d Brigade Combat Team of the 1st Cavalry Division used the facility to simultaneously train two task forces abreast, one in the virtual (CCTT) world and one on the ground at Fort Hood.

The CCTT is a marked improvement over the simulations network (SIMNET) and Janus simulations. A task force can use the facility to train METL-based tasks at an earlier stage in a training cycle. Soldiers and leaders then can enter a field training cycle at the "walk" phase rather than the "crawl" phase. In turn, units can prepare soldiers and leaders better to fight and win in war—the Army's basic mission.

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Lieutenant Colonel Jack D. Silvers commands the 2d Battalion, 82d Field Artillery, 1st Cavalry Division. In previous assignments, he served as Executive Officer for the 4th Infantry Division (Mechanized) Artillery at Fort Hood; the S3 Combat Trainer and Deputy Fire Support Combat Trainer for the Werewolf Fire Support Training Team at the National Training Center. Also in the 1st Cavalry Division, he was Assistant Fire Support Coordinator, and Battalion S3 and Executive Officer of the 1st Battalion, 82d Field Artillery. He commanded two batteries, one in the 4th Battalion, 77th Field Artillery and one in the 2d Battalion, 75th Field Artillery, both part of the 41st Field Artillery Brigade in Germany.

FSCATT Howitzer Crew Trainer, *(Photo by Kevin Tucker, Fort Sill TSC)*

Fire Support Combined Arms Tactical Trainer (FSCATT)

by Major James B. Brashear, AV

The fire support combined arms tactical trainer (FSCATT) is a simulator system that trains M109A5 and M109A6 (Paladin) howitzer crews, fire direction center (FDC) personnel and forward observers (FOs). M109A5 versions of FSCATT are being fielded with M109A6 versions to start fielding in March 2001.

Units can train on FSCATT in three modes: stand-alone (each component training individual and collective tasks independently), interactive (FDC generates a mission executed by the howitzer crew) or closed-loop (all three components in integrated training).

This article describes FSCATT's components, how the system trains and the status of the system's fielding.

System Overview. FSCATT is comprised of a high-fidelity howitzer crew trainer (HCT), the crew trainer's instructor-operator station (IOS), FDC simulator system (FDCSS) and an FO component.

Howitzer Crew Trainer. The HCT simulates functional aspects of an actual M109A5 or M109A6 howitzer; measures, records and displays actual firing data (deflection, quadrant elevation and bubble level); and monitors a crew's performance of individual tasks. The focus is to field an individual- and crew-level device to train the FA gunnery team to deliver accurate and predicted fires.

The system is fielded with all the projectiles, powders and fuzes units reasonably can expect to fire in combat: 14 types of projectiles, 12 types of fuzes and six charges. (See Figure 1.) A total of 39 projectiles, 39 fuzes, 40 reusable simulated M82 primers and 44 simulated charges with shipping canisters are included in FSCATT's basic issue. This permits realistic and continuous training of tasks involving ammunition preparation and handling.

Sensors inside the HCT capture data to assess crew-member performance as compared to published standards. (See Figure 2.) The IOS controls the HCT and captures data to develop an after-action review (AAR). In addition, contractor logistical support personnel use the IOS to maintain the HCT.

FDC Simulator System. The FDCSS allows FDC personnel to train in the stand-alone mode, simulating the howitzer and the FO. The FDCSS will interface with actual FDC hardware in the platoon and with the M109A5 or M109A6 howitzers, the latter in the interactive or closed-loop training modes.

Forward Observer. This component uses the guard unit armory device, full-crew interactive simulator trainer II (GUARDFIST II) to send calls-for-fire and receive "did hit" data to and from the HCT via the FDCSS.

Current Status. The M109A5 and M109A6 versions of the HCTs for FSCATT are in production. (See Figure 3 on Page 28.) A total of 34 M109A5

	Projectiles	Quantity
M107	High Explosive	10
M107	High Explosive (Deep Cavity)	2
M110A1	WP Smoke	1
M116A1	Smoke	2
M825	WP Smoke	2
M483A1	DPICM	7
M864	DPICM-ER	7
M485	Illumination	2
M549A1	HERA	1
M692	ADAMS-L	1
M712	Copperhead	1
M718	RAAMS-L	1
M731	ADAMS-S	1
M741	RAAMS-S	1

	Fuzes	Quantity
M557	Point Detonating	3
M564	Mechanical Time and Superquick	6
M565	Mechanical Time	1
M572	Point Detonating	3
M577	Mechanical Time and Superquick	2
M582	Mechanical Time and Superquick	6
M728	Proximity VT (Deep)	2
M732	Proximity VT	2
M732A2	Proximity VT	2
M739	Point Detonating	6
M762	Electronic Time	2
M767	Electronic Time	4

	Powders	Quantity
M3A1	Green Bag (Charges 1-5)	8
M4A2	White Bag (Charges 3-7)	12
M119A1	White Bag (Charge 8)	8
M119A2	Red Bag (Charge 7)	8
M203	Red Bag (Charge 8)	4
M203A1	Stick Charge (Charge 8)	4

Legend:
ADAMS-L = Area Denial Artillery Munitions System-Long
ADAMS-S = Area Denial Artillery Munitions System-Short
DPICM = Dual-Purpose Improved Conventional Munition
DPICM-ER = DPICM-Extended Range
HERA = High-Explosive Rocket-Assisted
RAAMS-L = Remote Anti-Armor Mines System-Long
RAAMS-S = Remote Anti-Armor Mines System-Short
VT = Variable Time
WP = White Phosphorous

Figure 1: FSCATT Projectiles, Fuzes and Powders

HCTs will be purchased, 18 of which already have been fielded. The remaining 16 HCTs are scheduled to be fielded by December 2000.

The 25-day M109A6 HCT user test was completed at Fort Sill, Oklahoma, in June 1999 with favorable results. Eleven M109A6 HCTs are scheduled for fielding from March to August 2001.

Training Concepts. The six M109A5 HCTs located at Fort Sill are used in the Training Command in support of programs of instruction (POIs) for Military Occupational Specialty (MOS) 13B Cannon Crewmember advanced individual training (AIT), the basic NCO course (BNCOC), the officer basic course (OBC) and the captains career course (CCC). FSCATT in both active and National Guard modified table of organization and equipment (MTOE) units supports initial and sustainment training.

In the closed-loop training mode, all three components interact and execute missions in accordance with standard procedures. For an adjust-fire mission with an M109A5, the FO identifies a target and sends a call-for-fire to the FDC. The FDC processes the mission and transmits the firing data to the HCT. For an adjust-fire mission with the M109A6, the HCT computes its own firing data with its automatic fire control system (AFCS).

The M109A6 also can perform degraded tasks in both the stand-alone and interactive modes. The degraded tasks simulate the loss of the AFCS, forcing

- Deflection Fired
- Quadrant Elevation Fired
- Bubble Leveling at the Time of Firing
- Projectile Type Fired
- Fuze and Fuze Setting Fired
- Propellant Type and Orientation
- Cant of Howitzer (Adjustable)
- Ramming Steps Performed During Mission
- Mission Duration Time

Figure 2: Howitzer Crew Trainer (HCT) Data to Assess Crew-Member Performance

Photo by Kevin Tucker, Fort Sill TSC

Guard Unit Armory Device, Full-Crew Interactive Simulator Trainer II (GUARDFIST II)

Location	Unit	Type	Devices	Fielding
Fort Sill, OK	1-78 FA	A5	6	Complete
Mesa, AZ	1-180 FA	A5	1	Complete
El Paso, TX	3-133 FA	A5	1	Complete
New Braunfels, TX	4-133 FA	A5	1	Complete
Lufkin, TX	1-133 FA	A5	1	Complete
Troy, AL	3-117 FA	A5	1	Complete
Oneonta, AL	2-117 FA	A5	1	Complete
Fort Dix, NJ	3-112 FA	A5	2	Complete
Camp Edwards, MA	1-101 FA	A5	2	Complete
Ethan Allen, VT	1-86 FA	A5	1	Complete
Milwaukee, WI	1-121 FA	A5	1	Complete
Dodge City, KS	1-161 FA	A5	1	Jul 00
Corpus Christi, TX	1-133 FA	A5	1	Aug 00
St. James, MN	1-125 FA	A5	1	Aug 00
Marshfield, WI	1-120 FA	A5	1	Sep 00
Camp Edwards, MA	1-101 FA	A5	1	Sep 00
Camp Smith, NY	1-258 FA	A5	1	Sep 00
Hampton, VA	1-111 FA	A5	1	Sep 00
Plymouth, PA	1-109 FA	A5	1	Oct 00
Hanover, PA	1-108 FA	A5	1	Oct 00
Grove City, PA	1-107 FA	A5	1	Oct 00
Indiantown Gap, PA	1-107 FA	A5	1	Nov 00
Ravenna, OH	1-134 FA	A5	1	Nov 00
Lansing, MI	1-119 FA	A5	1	Nov 00
Concord, CA	1-143 FA	A5	1	Nov 00
Los Alamitos, CA	3-144 FA	A5	2	Dec 00
Fort Sill, OK	1-78 FA	A6	4	Mar/Aug 01
Camp Casey, Korea	1-15/2-17 FA	A6	3	May 01
Geissen, Germany	2-3 FA	A6	1	Jul 01
Baumholder, Germany	4-29 FA	A6	1	Jul 01
Bamberg, Germany	1-6 FA	A6	1	Jul 01
Schweinfurt, Germany	1-7 FA	A6	1	Jul 01

Figure 3: Fielding Plan for M109A5 and M109A6 FSCATTs

the crew to manually set the firing data computed by the FDC.

FSCATT can train soldiers realistically to standard in a garrison environment without the time, maintenance and ammunition costs associated with live-fire field exercises. For example, in a six-hour training period, assuming four fire missions per hour at four rounds each, 96 rounds would be fired. At a cost of $420 per live round, FSCATT saves $40,320 in ammunition alone.

FSCATT facilitates a focus on fire delivery tasks. However, units need to train periodically on tasks not covered in FSCATT, such as position occupation, road marches, preventive maintenance checks and services (PMCS), etc.

In this era of reduced resources and manpower, FSCATT is instrumental in keeping our Field Artillerymen trained and ready.

Major James B. Brashear, Aviation, is the Project Director for four projects in the Simulation Training and Instrumentation Command (STRICOM), Orlando, Florida, including the Fire Support Combined Arms Tactical Trainer (FSCATT). Originally commissioned as Field Artillery, Major Brashear transferred to the Aviation branch and became a Black Hawk pilot. He then was assigned as Commander of C Company, 7th Battalion, 227th Aviation Regiment, part of the 1st Armored Division in Germany, where he served a tour with the Implementation Force (IFOR) in Bosnia. He is an Honor Graduate of both the Field Artillery Officer Basic and Advanced Courses, Fort Sill, Oklahoma, and holds a Master of Science in Interactive Simulations from the University of Central Florida.

Joint Force Quarterly Essay Contest

The *Joint Force Quarterly* announces its 1999-2000 "Essay Contest on Military Innovation" sponsored by the National Defense University Foundation, Inc. The contest solicits essays on exploiting technological advances in warfighting as well as the development of new operational concepts and organizational structures. Essays may be based on either historical analyses of military breakthroughs or contemporary trends in the conduct of war.

Winners will receive $2,500 and $1,500 for the two best essays. In addition, $1,000 will be presented for the best essay by a major/lieutenant commander or below (or equivalent).

Contest Rules. Entrants may be military or civilians of any nationality. An essay may be written by an individual or group of authors or derived from studies at intermediate and senior colleges (staff and war colleges), universities and other institutions.

The essay must be an original, unpublished manuscript of no more than 5,000 words, double-spaced typed, and submitted in triplicate. Endnote format for references is preferred.

Submissions. The entrant(s) must submit a letter with full name, social security number (or passport number in the case of non-US entrants), mailing address and daytime telephone and Fax numbers. In addition, he must submit a cover sheet with his full name and essay title, a summary of the essay (no more than 100 words) and his biography. Neither the name of an author nor any references to his identity should appear in the body of the essay. No electronically transmitted essays will be accepted.

Entries should be postmarked not later than 30 June: Essay Contest, ATTN: NDU-NSS-JFQ, 300 Fifth Avenue, Building 62, Fort Lesley J. McNair, Washington, DC 20319-5066. *Joint Force Quarterly* holds first right of publication of all entries.

LTC James J. Carafano, FA
Executive Editor, *Joint Force Quarterly*

FSST
Training to Win the Counterfire Fight

"Somewhere Near the DMZ, Korea (AP). An intense counterfire war has raged for four days. Thousands of artillery rounds have been exchanged between North Korean aggressors and our coalition team, and the coalition forces have prevailed.

"Brigadier General John Warfighter, Assistant Division Commander of the 2d Infantry Division, the largest US force on the Korean peninsula, spoke to this Daily News correspondent about the recent successes of the coalition forces as they repulsed advances from a determined enemy attacking from the north. He said, 'Although there's no doubt that all our coalition allies contributed significantly, the preponderance of our success was due to the most lethal ground force on the peninsula, the 2d Division Artillery.

'Specifically, our Division Artillery coordinated and rained masses of US, Korean and other coalition fires quickly on the enemy in support of decisive ground force maneuvering, fired devastating counterfire on the enemy's artillery and, along with coalition air power, broke the enemy's will to fight....'"

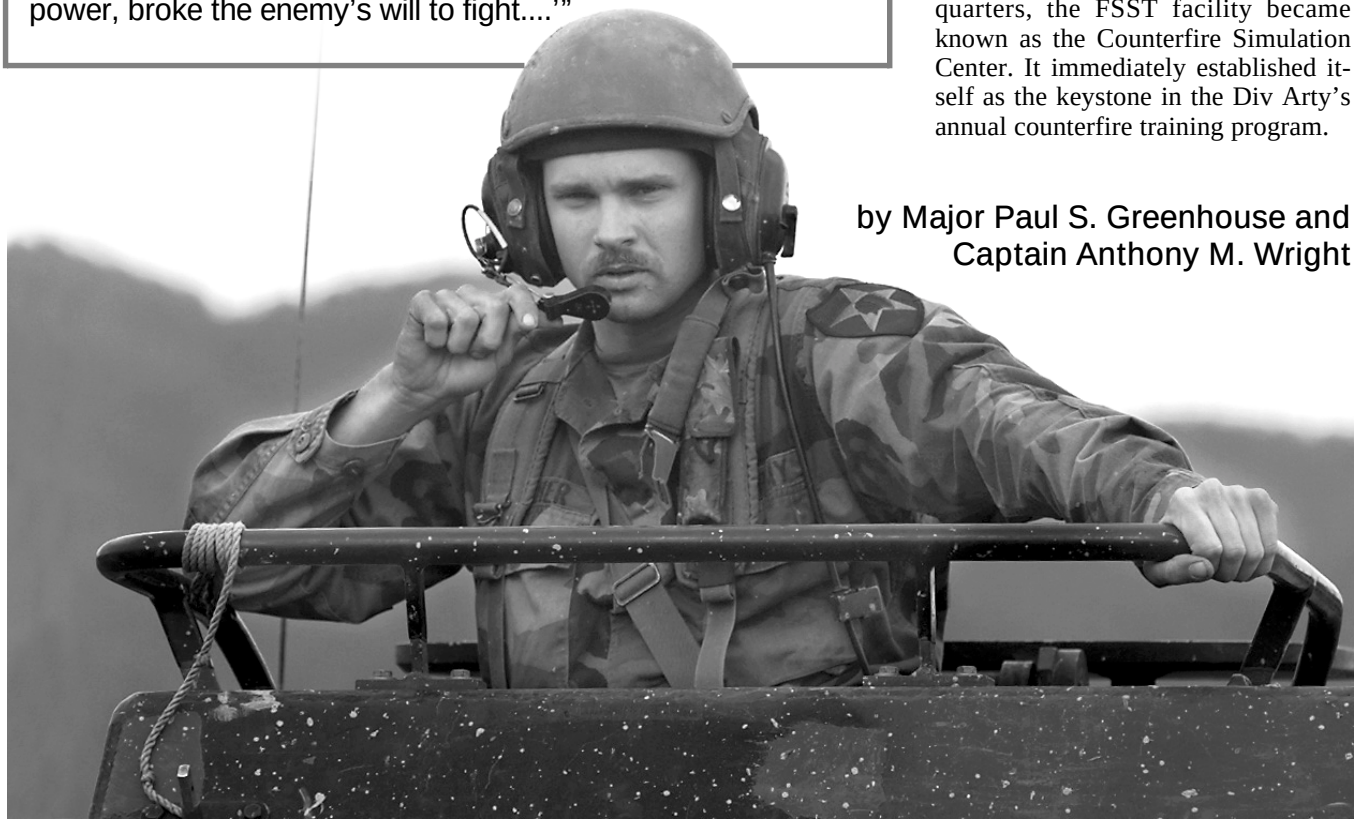
Although this scenario about deadly exchanges of massive rounds on the Korean peninsula may seem farfetched, it is very possible and a real threat for Redlegs on "Freedom's Frontier" in the Republic of Korea (ROK). The 2d Infantry Division Artillery (*Warrior Thunder*) remains combat ready via many training events.

The North Korean artillery wields a significant advantage in weapon systems, both in quantity and range. The North Koreans can range our forward defensive maneuver, artillery and support elements. Additionally, they can protect their artillery in hardened artillery sites (HARTs) and underground facilities (UGFs) just before or after unleashing lethal artillery strikes. The psychological terror the threat of this massive artillery barrage invokes in the populace is real.

In 1997, the Commander of the US Forces Korea (USFK) requested the Training and Doctrine Command (TRADOC) fund and provide a permanent counterfire training and rehearsal program to help units prepare to win the counterfire fight. In May 1998, the fire support sustainment trainer (FSST) became a reality. This article presents an FSST overview and discusses its training operations and future expansions.

FSST Overview. Located at Camp Stanley, Korea, the Div Arty's headquarters, the FSST facility became known as the Counterfire Simulation Center. It immediately established itself as the keystone in the Div Arty's annual counterfire training program.

by Major Paul S. Greenhouse and
Captain Anthony M. Wright



Track Commander SGT Mike Stacher, B Battery, 6-37 FA (MLRS)

The counterfire force, comprised of US and ROK forces, uses the FSST to train with a realistic scenario and increases fire mission responsiveness using synthetic theater of war-Army (STOW-A) programs. The FSST allows units to perfect fire mission processing tactics, techniques and procedures (TTP). If the current TTP are not working in the training, the unit can adjust them and restart the scenario from the beginning, resulting in more effective and efficient training.

Another advantage of this high-tech computerized simulation is that it reduces many of the military personnel support requirements of earlier systems. A civilian director and several technicians run and maintain the Counterfire Simulation Center's computer and communications equipment as well as the overall simulation. The manpower reduction gives the unit time to continue training on its other missions instead of providing administrative support.

The center maintains all the simulation equipment and programs the Div Arty needs to train for counterfire operations. The simulation is a result of combining, or fusing, three computer simulation programs: the extended air defense simulation (EADSIM), force-on-force interactive retasking environment (FIRE) and the fire simulation (FireSim) XXI.

EADSIM. The EADSIM provides the Red (enemy) force's maneuver, air defense artillery, missiles and aircraft for the training. It provides the Blue (friendly) force intelligence on enemy units and their actions and locations via information-gathering elements. These elements include the all-source collection element (ACE), the joint surveillance and target attack radar system (JSTARS), Special Operations Forces (SOF), long-range surveillance detachments (LRSDs), U2 surveillance aircraft, air reconnaissance liaisons (ARLs), close air support (CAS) pilot observations and unmanned aerial vehicles (UAVs).

FIRE. CAS and UAVs are controlled in FIRE but linked to EADSIM. FIRE allows units to task CAS and UAVs with missions without pausing the scenario, simulating reality.

FireSim. This system completes the simulation. FireSim provides the scenario for all artillery delivery systems and associated firing capabilities and all radars and acquisitions. It performs the actions of US and ROK howitzers, mul-tiple-launch rocket systems (MLRS), Firefinder radar sections (Q-36 and Q-37) and ROK multiple-rocket launcher (MRL) battalions, as ordered by their higher headquarters.

In FireSim, units are classified according to type and caliber, which leads to the system's portraying accurate ranges and rates-of-fire. It executes enemy fire missions according to a preprogrammed scenario validated by the intelligence section. The simulation takes into account ammunition loads that mirror the unit's realistic hauling capabilities, thus stressing the "whole team" concept. The combination of realistic friendly and enemy fires lets the counterfire force train as it fights.

A track from 6-37 FA (MLRS), 2d Infantry Division—part of the most lethal ground force on the Korean peninsula.

Data Collector. A fourth system serves primarily as a data collector for the simulation. Everything that happens during the simulation's run is recorded in this system's logs. This allows units to concentrate on training, not data collecting.

After the exercise, the unit can examine the events logs to gain feedback on mission times. Data on recorded events that may not have been noticed "in the heat of battle" help the unit determine improvements to TTPs. These data help the commander determine both his battlefield calculus and his planning factors.

FSST Operations. The simulation was designed so the counterfire force can train in the live mode or the live and simulated mode. Although the simulation can run with live units down to the gun, launcher and radar section level, these units are often simulated. With the high operational tempo in the Korean theater of operations, it is often necessary to simulate one or more units.

For example, a cannon battalion that's unavailable due to participation in a field exercise will not detract from the remainder of the counterfire force's ability to train. The FSST can run the battalion in a simulated mode with minimal input necessary from the division artillery fire control element (FCE).

The FSST's ability to exclude live units allows units to train on counterfire operations while other units train on tasks not associated with the counterfire fight. It also gives the counterfire force the option of focusing on a unit's mission and TTP rather than concentrating on the entire force.

The FSST initiates all enemy actions. For artillery fires, the FireSim sends data to a live or simulated radar section. The radar section receives acquisition data according to the instructions in its radar deployment order (RDO). The radar then sends the data to its controlling headquarters for processing. If the controlling headquarters determines the target meets the commander's attack criteria, the data are sent to the firing element for execution.

When the firing elements are in a simulated mode, FireSim executes the mission according to doctrinal times. If live howitzer and launcher sections are involved in the exercise, FireSim executes the mission immediately upon receiving the digital "shot" or mission fired report (MFR) from the unit.

The EADSIM provides data to Blue intelligence collection agencies in a similar manner. When collection agen-

cies are participating, they receive data from the simulation and take action in accordance with the commander's criteria.

The FSST determines enemy and friendly effects as the battle progresses. The Blue force's effects are based on the target type, ammunition, size of the unit executing the fire mission and the unit's responsiveness.

The counterfire force may decide to execute proactive fires in addition to reactive fires. The force's intelligence-gathering agencies begin this process with information they receive from the EADSIM, or the fires may be preplanned as a schedule of fires against known enemy HARTs or UGFs. Again, the FSST determines effects by examining the target, ammunition and firing unit size.

Progressive Training. The counterfire training runs in a helical pattern. When we first used the FSST, our major objective was to establish digital connectivity between all US forces involved in the counterfire fight. Although we achieved this goal within the first few exercises, we found we periodically needed to return to train on the "basics." With the Korean theater of operation's high turnover rate, this is especially crucial.

Div Arty units schedule time to use the FSST to train their operators and sections on executing the counterfire fight. This provides time to examine their internal TTP for fire mission processing.

The Counterfire Simulation Center has all the equipment the division FSE, the Div Arty FCE or the artillery battalions fire direction centers (FDCs) need to train for this mission. The equipment includes an advanced Field Artillery tactical data system (AFATDS), an automated deep operations coordination system (ADOCS) and the all-source analysis system (ASAS) "Warlord." Each digital device is a permanent fixture in the Counterfire Simulation Center. Having the equipment on hand and operational at all times minimizes setup times and maximizes training time while keeping the unit's command, control, communications, computers and intelligence architecture (C^4I) intact.

After units train individually, exercises evolve to include additional elements of the counterfire force; this culminates with the entire force executing a counterfire scenario for 48 to 60 hours: Theater Counterfire Simulation Exercise.

Given the equipment challenges and work that remain to make the counterfire force's digital connectivity complete, we try to incorporate as much digital equipment as possible. Establishing connectivity with so many pieces of digital equipment at different levels is excellent training for the counterfire force.

In spite of our lack of total digital connectivity, the Theater Counterfire Simulation Exercise is excellent training for counterfire operations specific to this theater. The actions of the enemy and his volume of fires are accurately portrayed in the simulation, making the training even more worthwhile.

The Div Arty conducts monthly counterfire sustainment training. "Hallmark" events are held semi-annually and are conducted before a major theater-level exercise, such as Ulchi Focus Lens (UFL). These exercises include the counterfire force's units and other units not directly involved in the counterfire fight.

Expanding FSST. With each training event, we attempt to incorporate another progressive step of the counterfire fight. We are making great progress in this respect, by incorporating additional units into training. We also are increasing digital connectivity across the board, thereby maximizing the effectiveness of the counterfire force.

Currently, all US counterfire forces and ROK corps artillery liaison officers train in the FSST. They receive missions from the Div Arty FCE and, in turn, send the missions to the Counterfire Simulation Center for execution via FM voice communications.

The next progression of FSST training capabilities is to add an ROK corps artillery FCE. We then will pass missions through US liaisons with the corps artillery. The Div Arty FCE will send fire missions digitally to the US liaisons, who will send them to the ROK corps artillery FCE to process.

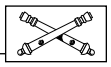
The liaison teams will be connected digitally to the ROK radars through the corps artillery FCE's tactical fire direction computer. The corps artilleries associated with these radars still will be responsible for executing the counterfire missions generated by these acquisitions.

The purpose of the liaison teams at the corps artilleries is threefold. Most important, through their ADOCS, they provide a common operating picture (COP). This enables the command to make decisions based on actual, rather than templated, events or locations. Second, they pass fire missions to the Div Arty FCE to process missions the corps artillery can't execute. Finally, the liaison team is the link when the Div Arty FCE requires the corps artilleries to fire missions.

These progressive steps toward incorporating more of the counterfire force into our counterfire simulation exercises are necessary. Korean augmentees to the US Army (KATUSAs) are an essential part of this task. US and ROK forces use different computer and radio systems, which stresses the important role our KATUSAs and liaison sections play in interoperability. Fortunately, we have established strong ties with the ROK corps artilleries, and these ties are making our goals manageable and achievable.

Thanks to the FSST, the counterfire force in Korea has become the effective and decisive force we need it to be. As a result of bringing the force together to fight simulated battles, we have dramatically improved our tactical and technical proficiency for any real battles we may be called to fight. This is, no doubt, a strong deterrent for both our simulated and real opponents.

The Redlegs of Freedom's Frontier and the entire TF Thunder stand ready to deter, and if deterrence fails, to fight and win decisively. *Warrior Thunder!*



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Captain Anthony M. Wright is the 2d Infantry Division Artillery Fire Control Officer at Camp Stanley. His previous assignments include serving as a Battery Executive Officer in the 1st Battalion, 79th Field Artillery at the Field Artillery Training Center, Fort Sill, and Battery Executive Officer and Platoon Leader in the 3d Battalion, 18th Field Artillery, 17th Field Artillery Brigade, III Corps Artillery, also at Fort Sill. He is a graduate of the Combined Arms Services and Staff School at Fort Leavenworth, Kansas, and the Paladin and Multiple-Launch Rocket System Courses at Fort Sill.

A Digital Training Strategy for

by Colonel Rhett A. Hernandez and Major John C. Thomson

As the Army moves into the 21st century—the information age—digitization is rapidly changing the way we train and fight. Digitized systems provide opportunities to rapidly translate volumes of data into useful information that benefits battle command and decision making. Tedious and time-consuming soldier tasks are being replaced by near real-time, automatic situational awareness processes. Operation orders and accompanying overlays are transmitted digitally and then followed by collaborative rehearsals from distributed locations. It sounds like a commander's dream, but digitization has its challenges.

B/2-20 FA (MLRS) Battery Operations Center (BOC)

At the forefront of the challenges is the need to maintain digital proficiency that results in a trained and ready force capable of sustaining tactical warfighting in concert with information dominance. This requires a digital training strategy.

Three years ago, the Chief of Field Artillery, then Major General Randall L. Rigby, remarked in the March-April 1996 edition, "…digitization will cause a revolution. Digitizing the force will require us to rethink the way we train the FA soldier and his commanders and staffs—our frame of reference will have to shift." General Rigby's comments remain on target today as the 4th Infantry Division (Mechanized), Fort Hood, Texas, moves toward becoming the first digitized division (FDD).

With the increasing number of digital systems, this new "frame of reference" calls for a holistic digital training strategy, horizontally balanced with vertical integration of the systems, continuous software changes, a growing need for distributed operations and continual sustainment training for perishable operator skills. This article outlines the 4th Infantry Division Artillery's holistic digital training strategy and describes the division's FireStrike training exercise for the digitized brigade task force.

Digital Systems. The number of digital systems is staggering. In the 4th Division Artillery (Div Arty), we have the advanced FA tactical data system (AFATDS), battery computer system (BCS), fire direction system (FDS), handheld terminal units (HTUs), maneuver control system (MCS), all-source analysis system-remote work station (ASAS-RWS), combat service support control system (CSSCS), global command and control system-Army (GCCS-A), Force XXI battle command brigade and below (FBCB^2), meteorological measuring system (MMS), position and azimuth determining system (PADS), movement tracking system (MTS), automatic fire control system (AFCS), fire control panel (FCP), standard installation/division personnel system-3 (SIDPERS-3) and unit-level logistics system (ULLS).

Their corresponding communications systems complicate matters when you consider the single-channel ground and airborne radio system (SINCGARS); advanced SINCGARS improvement program (ASIP) radios; Spitfire, the AN/PSC-5 tactical satellite communication system (TACSAT) radio; single-channel anti-jam man portable (SCAMP) TACSAT radio; near-term digital radio (NTDR); mobile subscriber equipment (MSE); enhanced position location reporting system (EPLRS); and tactical operations center (TOC) intercoms, just to name a few. One of the first lessons for incoming personnel to a digitized unit is "*Acronymology 101*."

However, the bigger lesson is that most soldiers already perform their duties behind some sort of digital system. We can no longer afford to merely initialize the battalion fire direction center (FDC), the battery FDCs and some fire support elements (FSEs) and call that digital sustainment training.

Horizontal Integration. The Field Artillery led the Army into the tactical digital world and has long been at the forefront of technology. However, today, other branches, services and even other nations accompany Redlegs in digitization.

We cannot afford to be a stove-piped, vertical organization in the digitized force. Horizontal integration with other battlefield functional areas (BFAs) is just as important as vertical integration—from the guns and fire support

teams (FISTs) to corps and division headquarters. Accurate, timely and lethal sensor-to-shooter linkages demand it.

One horizontal integration technique is establishing target intelligence criteria (TCRIT) that is mapped to an ASAS. The intelligence BFA then knows what targets we want to attack and responds with target intelligence data (TIDAT).

Our Army tactical command and control systems (ATCCS) allow us to do this very quickly via digital means—a great improvement over carrying a "yellow sticky" with a grid and a target type from the G2/S2 to the fire support officer (FSO). However, this is a learned skill that requires combined arms training.

Vertical Integration. We must be as proficient at the corps FSE as we are at the battery FDC when it comes to digital operations. Streamlined attack analysis in AFATDS, processed digitally, facilitates destruction of the enemy.

Consider a high-payoff, yet fleeting target, such as an enemy multiple-rocket launcher (MRL), that is fed into an AFATDS at the division tactical command post (DTAC) FSE from an unmanned aerial vehicle (UAV) via a TIDAT. Unless it is already cleared through an established zone of responsibility (ZOR) in AFATDS, it is sent to a brigade combat team (BCT) FSE and, possibly, to a task force FSE and company FSO for coordination.

It then is sent to the Div Arty fire control element (FCE) and to a battalion FDC for fire support analysis. From the battalion it migrates to a battery FDC for detailed analysis before being sent to a Paladin and (or) a multiple-launch rocket system (MLRS) for a technical solution and firing.

AFATDS allows this process to happen in a matter of seconds. The key is a *properly constructed database* with clean geometry and ZORs, accurate attack guidance and correct support relationships. Fire support nodes at all levels share the burden and must be included in digital training.

Software Changes. The ability to make rapid improvements to software for the benefit of the warfighter is a double-edged sword. Program managers and software engineers have the ability to make product improvements and field them with amazing speed.

These improvements give warfighters increased capabilities, but at the same time, increase the training challenge. Every time a new "software drop" occurs, it invokes a requirement for "delta" training. Software changes also force continual changes to tactical standing operating procedures (TACSOP) and tactics, techniques and procedures (TTPs).

Although problematic, the software changes are a fact of digitization and must be included in digital training.

Distributed Operations. Much of our artillery is now in the Army National Guard (ARNG) and based throughout the continental United States (CONUS). Furthermore, our three corps artilleries are scattered and not always located with the units they would support in war. During the past several years, we have been reinforced by the 138th FA Brigade, Kentucky ARNG; 147th FA Brigade, South Dakota ARNG; and 214th FA Brigade, Fort Sill, Oklahoma.

Additionally, the 4th Division is teamed with the 40th Infantry Division (Mechanized) of the California ARNG. We are a split-based unit with an entire BCT at Fort Carson, Colorado, and a dual-component MLRS battery located in Wichita Falls, Texas. (One-third of our division MLRS battalion is dual-component: part of the active force and ARNG.)

Resources limit our ability to physically consolidate and train together, but technology presents the capability to sustain collective training through distributed operations. The long pole in the tent is bandwidth. But bandwidth is increasing at a tremendous rate, so we must consider separated but linked digital platforms in future digital training strategies.

Operator Sustainment. Today in the Field Artillery, we have a number of digital systems; not all are compatible, and they vary from unit to unit. Soldiers, NCOs and officers coming from the institutional base are not necessarily trained on using all our digital systems. In fact, when NCOs attend the advanced NCO course (ANCOC) at Fort Sill, they learn about the initial fire support automated system (IFSAS)—not AFATDS.

This issue represents the complexities of digitization in the Army as a whole and clearly illustrates the need to train individual operator skills at the unit. It is more than a schoolhouse issue, and it impacts the entire Army.

Based on these requirements, we see a greater need for training than the old standard of 20 hours per week of digital communications exercise (COMMEX) training.

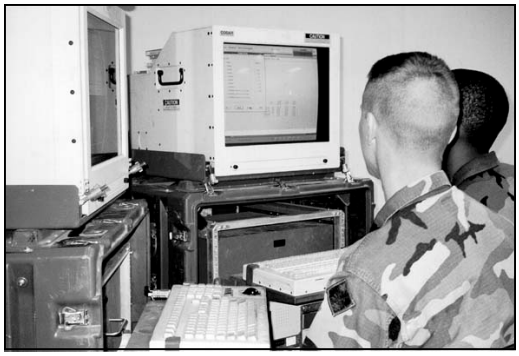
Our digital training strategy must leverage both live and virtual simulations, implement specialized means for individual and collective training, have low overhead and achieve certain ends that make digitization a warfighting enabler.

C/4-42 FA Platoon Operations Center conducts FDC Table XIV Battery Certification on the West Range of Fort Hood in support of Paladin training.

Digital training in the 4th Div Arty is done weekly through a series of standard programs, such as FIST and FDC tables. The programs are not stand-alone but are based on a larger model used by the National Simulation Center (NSC) and Simulation Training and Instrumentation Command (STRICOM). Using this approach to simulation training, the 4th Div Arty methodology for digital sustainment training is embedded on five levels and is not limited to simulation training. (See Figure 1.)

This method is simple and straightforward. It starts with the basics of individual competence (Level I) and works up to the fully integrated command post (Level V). It is a "gate" strategy that mandates basics are trained before moving on to graduate-level work.

Using this methodology, our paradigm for a digital training strategy is framed in terms of "ways, ends and means." As shown in Figure 1, the *ways* represent standard training events at the various training levels—events that are standardized across the Div Arty. There are several ways to conduct digital sustainment training: live, virtual or a combination of both. The bigger challenge is scheduling and resourcing the events at a frequency that truly sustains digital skills.



Soldiers from the 4th Div Arty Fire Control Element (FCE) conducting part of their 20 hours of weekly digital fire support training.

While the *ways* are many, the *means* are not so numerous. The means in Figure 1 are the simulations and devices that support both horizontal and vertical training. In recent months, we have used two new simulations with enormous potential—the digital battlestaff trainer (DBST) and the simulation/stimulation (SISTIM) training device. Both systems are taking digital sustainment training to new heights. However, additional systems are needed to ease the overhead associated with digital training and to cover the full spectrum of training levels.

The *ends* are the *sine qua non* of digital training—the essentials that make the difference between quality and lackluster training. In the 4th Div Arty, we affectionately call them the "dirty dozen" (see Figure 2).

Not every training event will achieve all the ends, but they serve us well in planning and designing digital training. To have quality digital sustainment training, simulations (the means) must fulfill the dirty dozen (the ends).

FireStrike for the Digitized Brigade. In September 1999, we executed a multi-faceted, week-long exercise with distributed operations between Fort Hood and Fort Carson, an exercise that, appropriately, was named FireStrike. During FireStrike, we trained for an upcoming National Training Center (NTC) rotation at Fort Irwin, California, replicating a brigade task force scenario with live and simulated participants (see Figure 3). The scenario incorporated live fire: MLRS, AH-64 Apaches and OH-58D Kiowa Warrior helicopters and close air support (CAS). In addition, we stimulated four of our six ATCCS systems: AFATDS, MCS, ASAS and air mobile defense warning system (AMDWS).

One of the Paladin battalions participating live was digitally linked into the exercise from Fort Carson via a long-haul communications system, called Arctic. It allowed FM voice and digital communications between Forts Hood and Carson.

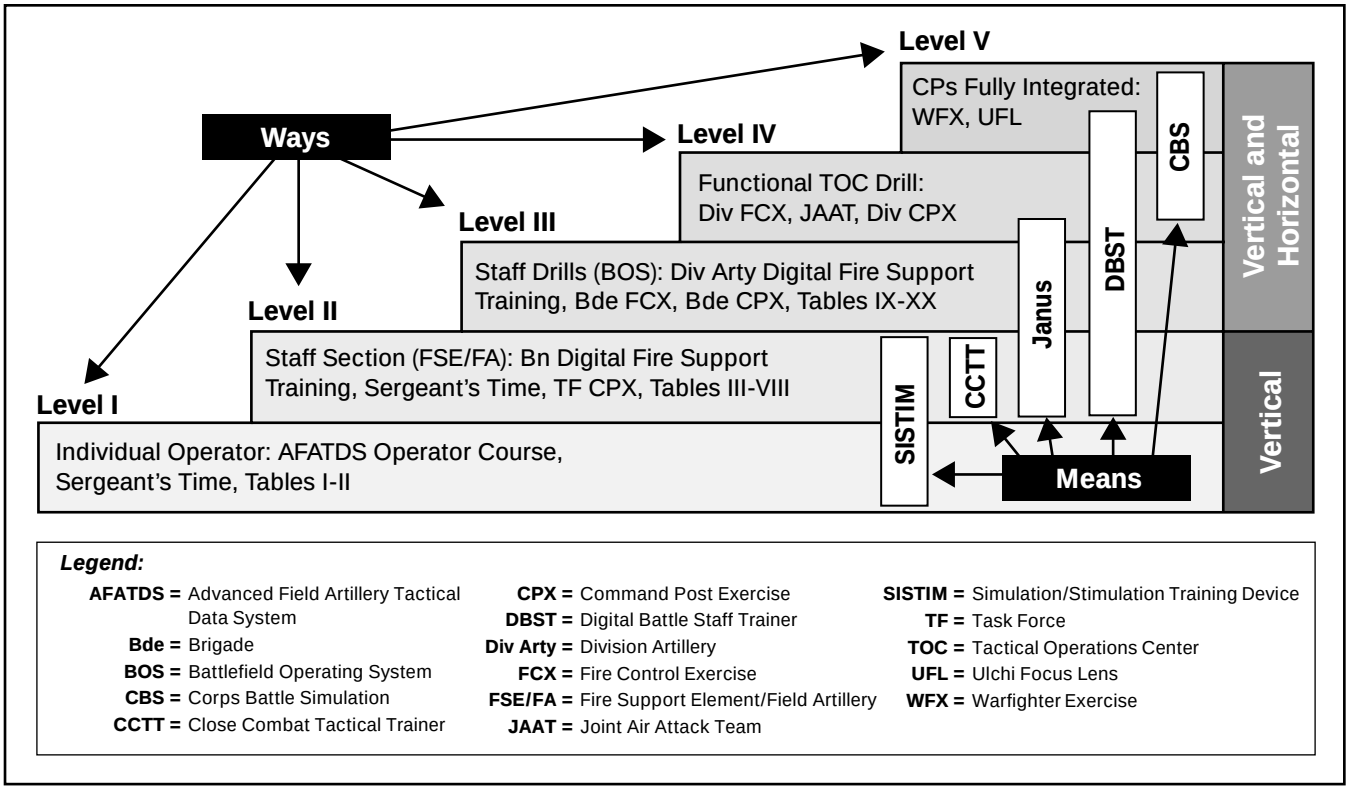


Figure 1: Digital Training Strategy

- Linked to Combined Arms Training
- Integrates Entire Fires Team
- Dynamic Tactical Scenarios (Enemy, Terrain, Mission)
- Low Overhead (People and Time)
- Multi-Echelon Training Driven by Multiple Training Objectives (AC and RC)
- User Friendly (Easy to Use)
- Flexible (Intensity, Repetitive)
- Realistic (Stressful, Rigorous)
- Replicates Communications (Home Station, Long Distance)
- Stimulates Full ATCCS Suite (Horizontal and Vertical)
- Built-In AAR Capability
- Supports Transition to Future Systems

Legend:
AAR = After-Action Review
AC = Active Component
ATCCS = Army Tactical Command and Control System
RC = Reserve Component

Figure 2: The Dirty Dozen "Ends"—Requirements for Quality Digital Sustainment Training

The exercise also linked sensors-to-shooters, including sensors such as the joint surveillance and target attack radar system (JSTARS), UAVs and Firefinder radars, and administered an MLRS battalion external evaluation (EXEVAL). The MLRS battalion fired live suppression of enemy air defense (SEAD) missions in support of both Army aviation and CAS during its EXEVAL.

A common ground station took all live and simulated sensor feeds that permitted the division FSE and intelligence support element to conduct realistic targeting and proactive counterfire. With the addition of live and simulated Firefinder radars, at some points during the exercise more than 200 targets were processed per hour.

Firestrike was robust enough to stress several command posts and an MLRS battalion for 96 hours. The integration of both live and virtual training provided a Warfighter-type exercise but without the cost. The exercise generated significant lessons used to update our TACSOP and TTPs.

The exercise also served as the fielding of DBST to III Corps and Fort Hood. DBST is a new federation of simulations that greatly enhances combined arms command post exercises (CPXs), but, with a little work, easily can be adapted to support live fire. The federation uses the existing simulations of Janus, fires simulation (FireSim) and the extended air defense simulation (EADSIM) and ties them together, so every BFA has a realistic and rigorous workout without requiring a large "white cell" to drive the training.

Although the exercise was highly successful, we cannot rest on our laurels. The future beckons as the 4th Division moves toward becoming a digitized division in the capstone exercises at the NTC in the spring of 2001 and at Fort Hood in the fall of 2001. Our experiences over the past several years are a cogent argument for pursuing a sound and thorough digital training strategy.

The advanced systems being fielded will not revolutionize our Army by themselves; rather, trained operators, crews and staffs who know how to horizontally and vertically integrate these systems while maintaining a warrior ethos will revolutionize our Army. In essence, we need a training revolution, not just an information revolution. *Iron Gunners!*

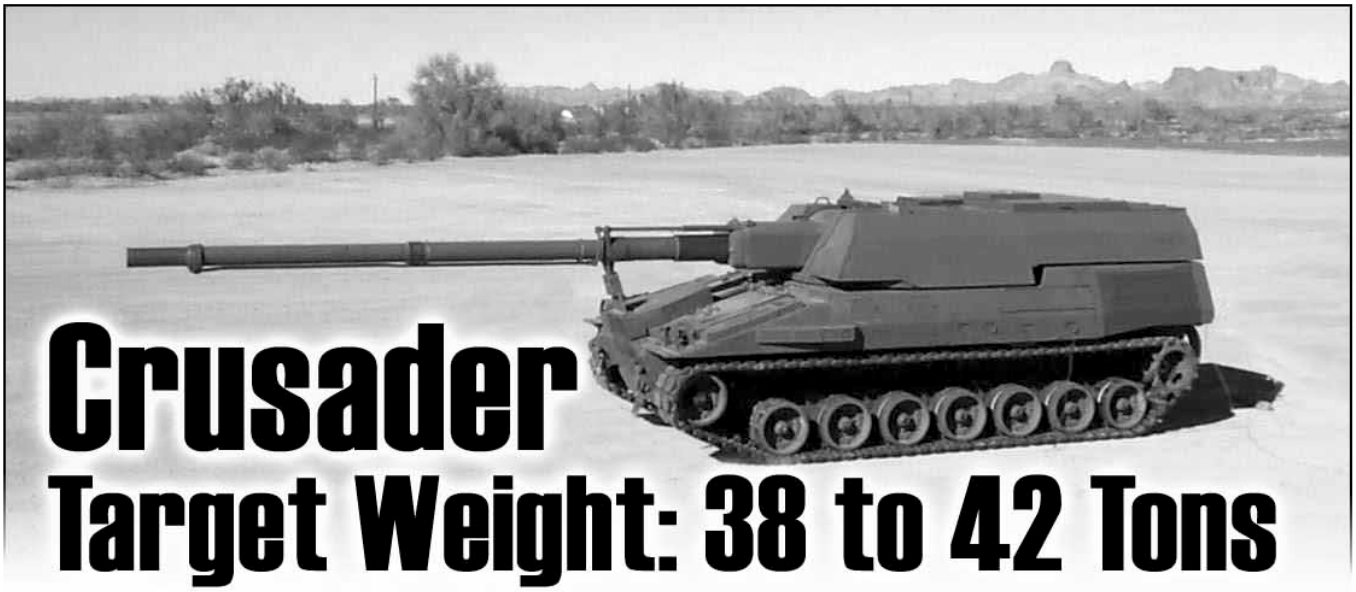
Live Players (Stimulated)
- Division Tactical Command Post (DTAC)
- Aviation Brigade Tactical Operations Center (TOC)
- Division Artillery TOC
- Two Q-36 Firefinder Radars from Forts Hood and Carson and Two Q-37 Firefinder Radars from Fort Hood
- Divisional MLRS Battalion
- Paladin Battalion TOCs from Forts Hood and Carson
- Close Air Support (CAS) from the Marine Corps Reserve and Air Force Reserve
- Two Kiowa Warrior Air Troops from the Divisional Cavalry Squadron
- Joint Surveillance and Target Attack Radar System (JSTARS) from Robbins AFB, Georgia
- Apache Attack Company from the Divisional Attack Battalion

Notional Players (Simulated)
- Field Artillery Brigade
- Mechanized Infantry Task Force
- Light Infantry Task Force
- Unmanned Aerial Vehicles (UAVs)
- Firing Units of Three Paladin Battalions

Figure 3: Players for the 4th Infantry Division's FireStrike Exercise, 13-17 September 1999

Colonel Rhett A. Hernandez commands the 4th Infantry Division (Mechanized) Artillery at Fort Hood, Texas. He has been training digitized Field Artillery units in heavy divisions since 1981. In his previous assignment, he was the Senior Field Artillery Branch Representative and Strategic Planner for the Officer Personnel Management System (OPMS) XXI Task Force in the Office of the Chief of Staff of the Army at the Pentagon. He commanded the 3d Battalion, 16th Field Artillery, 4th Infantry Division. He also served as a Brigade Fire Support Officer, Battalion Executive Officer and S3 and Commander of two batteries in the 1st Infantry Division (Mechanized) at Fort Riley, Kansas, and in Germany.

Major John C. Thomson is the S3 for the 4th Infantry Division (Mechanized) Artillery, Fort Hood. In his previous assignment, he was the Assistant Fire Support Coordinator for Plans in the 4th Infantry Division. Recent assignments with the 1st Armored Division in Germany include serving as Commander of B Battery, 4th Battalion, 29th Field Artillery and Assistant S3 for the Division Artillery; he also served as Targeting Officer and Assistant S4 for the 2d Armored Cavalry Regiment in Germany and in the Gulf during Operation Desert Storm. Major Thomson holds a Master of Science in Education from Long Island University and is a graduate of the Command and General Staff College at Fort Leavenworth, Kansas.



Crusader Target Weight: 38 to 42 Tons

by Major Donald L. Barnett

When I talk about agility and lethality, what Crusader brings and has always been part of its design [are] longer range, precision and high rate-of-fire....In terms of these characteristics, Crusader fits the bill....Where it doesn't necessarily fit the bill is weight... So the challenge for us is to go back and ask, "Why do we have to live with that?" And that's what we are doing.

General Eric K. Shinseki
Chief of Staff of the Army
Defense Writers' Group, 10 November 1999

Shelve the "doom and gloom" talk—the Army wants Crusader. With a target weight of 38 to 42 tons, Crusader is an integral member of the Army's dominant maneuver force.

The decisive land combat formations needed for major theater war scenarios—the most dangerous missions in our national military strategy—will be comprised of M1A2 Abrams tanks, the M2A3 Bradley fighting vehicles and Crusader howitzers. The Army's heavy force will provide America an offensive maneuver overmatch capability against major regional threats. In the active force, this strategic hedge is the III Armored Corps. Crusader's speed, mobility and lethality will unleash the digitized Abrams/Bradley maneuver force now slowed by our current artillery systems and enable the force's rapid offensive action.

In December 1999, the Army leadership was briefed on an alternative Crusader design to significantly reduce its weight while maintaining the key performance parameters the Army needs. (See Figure 1.) With weight as a crucial variable to the Army's deployment needs, Team Crusader launched a redesign initiative to meet the Army's intent for a highly deployable artillery system with the performance characteristics to fight in a major theater war.

First, Team Crusader determined the weight requirements for moving the system by air transport. When analyzing the howitzer's initial design requirements, the team determined that a single vehicle could fit into a C-17 Globemaster and two could fit into a C-5 Galaxy transport. However, due to their weight, only two howitzers could be airlifted by a C-5 if a waiver was granted by the Air Mobility Command. The design team looked for a target weight that would facilitate transporting two howitzers on a C-5 without weight waivers.

After preliminary analysis, the team determined the howitzer's target weight of 38 to 42 tons will preserve the C-5 deployability intent. Preliminary engineering studies show that a modified howitzer prototype will fall within the 38- to 42-ton bracket—approximately a 30 percent weight reduction.

- The howitzer has a state-of-the-art cockpit with embedded command and control that lets the crew fight the system to its maximum potential.
- The howitzer has a robust cannon that doesn't overheat and produces a tremendous rate of fire—10 to 12 rounds per minute out to 40 to 50 kilometers with assisted munitions.
- The resupply vehicle has a reliable ammunition-handling system that doesn't jam and keeps the projectiles coming; the system can rearm the howitzer with 60 rounds in 12 minutes or less.
- The howitzer and its resupply vehicle each have a powerful power train that allows the systems to move at 67 to 78 kilometers-per-hour on the highway and 39 to 48 kilometers-per-hour cross-country—unleashing the speed of the Abrams tank and Bradley fighting vehicle-equipped maneuver force.
- The howitzer and resupply vehicle each have a suite of survivability features that protects the soldier and the system.

Figure 1: Crusader Program's Key Performance Parameters. The Crusader program's alternate design to save weight now in progress will not affect these key performance parameters—parameters that are unique to Crusader as compared to howitzers worldwide.

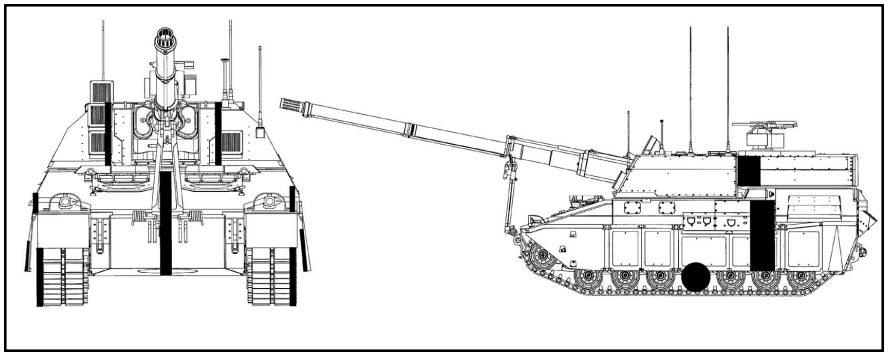


Figure 2: Crusader Width and Length Reductions. The darkened areas of this illustration show where the width and length of the howitzer will be reduced. The width reduction is expected to generate one to two tons of weight savings, and the length reduction should save about one and one-half tons.

So why not attempt to reduce the weight 50 percent or more? Congress asked this question a little over a year ago and was satisfied with the Army's answer. In summary, the answer is that it isn't technically feasible now or in the foreseeable future to develop a cannon artillery system capable of the minimum required performance weighing less than 50 percent of the current prototype weight. Chief among the reasons is that meeting the required key performance parameters requires an automated ammunition-handling system and a thermally cooled cannon. The Army continues to revalidate the need for an artillery system with Crusader's performance characteristics.

Lightening the System. So what is being done to lighten Crusader to meet the target weight of 38 to 42 tons? Several key subsystems are candidates for modification. The following examples are from the howitzer, but most apply equally to the tracked resupply vehicle. At this point, the tonnage listed in each category as anticipated savings is an estimate.

• *Automotive Changes.* Significant weight savings come from changing the power plant and drive train. During the past year, the Army began considering a new, highly reliable lightweight engine for the M1 Abrams—a candidate for Crusader. A lighter weight engine and a lighter transmission and track system could save five or six tons over the current Crusader prototype. These new developments represent exciting but technologically challenging changes.

• *New Materials.* Redesigning and replacing the current vehicle structure and components with lighter weight materials offer significant opportunities for weight savings. For example, the rear access door to the engine bay and the gun cradle can be made of titanium or other lightweight materials. Alterations to various vehicle components could achieve four tons in weight savings. These savings were identified previously but were on-hold for prototype development reasons.

• *Reduction in Width and Length.* Design refinements to the Crusader hull and turret could net two to three and one-half tons of weight. The refinements could reduce Crusader's length by approximately 12 to 16 inches and its width by approximately six inches. (See Figure 2.) The reduction of Crusader's size also will ease intra-theater movement in underdeveloped countries that have substandard roads and rail networks.

• *Modularized Armor.* Armor survivability kits can generate three or more tons of savings for air deployment. This is a fundamental shift from a fully integrated armor suite in the current design to add-on kits. (See Figure 3.) The basic hull and turret structure will maintain a better survivability rating than the current M109A6 Paladin hull and turret, while the add-on kits will enhance protection against specific regional threats.

The Army will be able to airlift the lighter Crusader to small-scale contingencies to augment the firepower of medium and light forces. If a contingency deteriorates into a more lethal environment, the Army will be able to add armor kits and employ aggressive "shoot and scoot" tactics, techniques and procedures (TTP) to defeat the enemy's counterfire.

• *Payload Reduction.* The smaller hull structure requires a payload reduction. Approximately one ton is saved by reducing the howitzer payload by eight to 12 rounds (from the current 60 rounds to 48-52 rounds on board) and the size of the automated ammunition racks.

As with any development program and, certainly, with a redesign, there are some risks that must be mitigated. For example, a change in the ammunition basic load requires Team Crusader restudy the ammunition support of the battalion. The team is confident that an appropriate battalion force structure coupled with sound TTP will allow Crusader battalions to maintain the required firing tempo.

Resupplying Crusader. Ammunition throughput is being addressed by initiating a design for a wheeled resupply vehicle (RSV-W) to complement the tracked resupply vehicle (RSV-T). The RSV-W initiative provides the opportunity to develop an automated resupply module (RSM) carried by a wheeled vehicle. An RSM is a self-contained ammunition-handling system that transfers munitions and fuel to a howitzer or another RSV.

The automated RSM is required to have the same ammunition transfer capabilities as the RSV-T. The RSM must be capable of autonomous transfer operations; it must be able to transfer munitions and fuel directly from, for example, a palletized loading system (PLS) truck to the howitzer and to be loaded as a module onto another PLS truck or offloaded onto the ground. The combination of the RSV-W's PLS truck and RSM is expected to weigh 31 tons, based on estimates using the PLS vehicle as the prime mover.

The advantages of the RSV-W include increased road speed and the increased flexibility provided by an autonomous RSM and automated ammunition transfer. The primary disadvantages are the lack of armor protection and mobility as compared to the RSV-T. How-

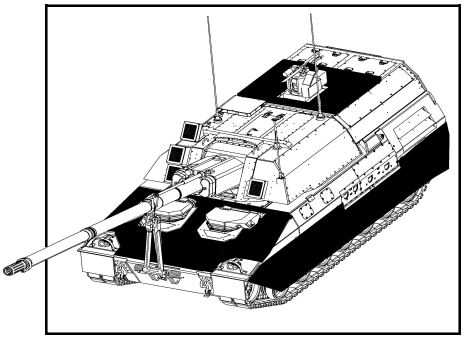


Figure 3: Modularized Armor. The redesigned Crusader will have the option of add-on armor kits (shown in darkened areas of the illustration). The options will increase Crusader's versatility for military operations, including deployments in support of medium and light forces.

ever, Crusader TTP can help mitigate this disadvantage.

For example, in one resupply TTP, the RSV-W could employ the hide-point concept. The PLS truck would transport the RSM to a hide position where the truck would wait with the RSM or off-load it. The ability to off-load automated RSMs will provide the Crusader battalion tremendous flexibility in ammunition operations.

Crusader units could use ammunition hide-point TTP like those used by multiple-launch rocket system (MLRS) battalions in establishing rocket pod caches. The MLRS launchers travel from their firing points to the pod caches to reload and then move to new firing points. Crusader similarly could link up with the RSV-W at hide-points.

The initial proposal is for Team Crusader to analyze a 50-50 mix of RSV-Ts and RSV-Ws for the Crusader battalion. The RSV-T will execute current rearming options (under armor) in high-intensity scenarios, while the RSV-W will maintain ammunition throughput for warfighting. In mid-intensity or low-counterfire threat scenarios, both RSV variants will resupply the howitzers directly. A thorough analysis in the coming year will provide Team Crusader useful data for developing sound TTP.

Deploying Crusader. So, what do these weight savings get us? First, the deployability of the system will double. The Army will be able to transport two howitzers with a C-5 on a standard 3,200 nautical mile (NM) deployment leg. Because the key performance characteristics have not changed, these two howitzers will have the firepower of six of today's howitzers. The Army's ability to airlift RSV-Ws with its howitzer will be a weight-savings option for future rapid deployments.

To illustrate this deployability savings, consider a scenario based on experience in Kosovo. A battery of Paladins with associated equipment and supplies required eight C-5 aircraft to deploy. A two-gun Crusader detachment providing equal firepower will require only four C-5s. Crusader-equipped detachments will require fewer personnel (38 versus 90) and vehicles (12 versus 25) and less stockage of all classes of supply.

The measurement of deployability is not determined solely through a count of systems, but rather the combination of numbers and effectiveness of those systems. The ability to project an equally effective fire support package in half the sorties is a significant deployment savings.

The Crusader battalion will be at least a three-fold increase in cannon battalion effectiveness. The artillery will be able to tailor Crusader fire support packages with other FA systems, e.g., the high-mobility artillery rocket system (HIMARS), thus giving force commanders a wide range of fires capabilities.

Crusader fire support packages will provide future maneuver commanders a tremendous increase in firepower. Lightening Crusader will allow the Army to rapidly project lethal Crusader fire support packages to any theater and fully supports the Army's vision of the future.

Crusader Prototype Fires First Round

Throughout the turmoil generated by recent announcements about the new Army deployability vision and budget decisions, Team Crusader has continued to build and test prototype components. The first prototype Crusader self-propelled howitzer, the SPH-1E, successfully fired its first round in testing at Yuma Proving Ground in Arizona on 23 February.

So the question arises, "Why continue prototype development and testing if the howitzer must be redesigned to make it lighter?" Simply stated, the candidate redesign features do not affect many of the subcomponents of Crusader that enable the system to meet the key performance parameters.

The first prototype self-propelled howitzer, SPH-1E, was assembled at United Defense, Minneapolis, Minnesota, last fall and shipped to Yuma Proving Ground in January. SPH-1E supports testing of the system's live-fire of the cannon, auto-loading and ammunition-handling. The howitzer doesn't have an engine because the first tracked resupply vehicle (rolled-out in July 1999) is the mobility test vehicle.

Live-fire tests enhance system reliability, establish factual test data for software development and provide proof-of-concept for such revolutionary capabilities as a sustained rate-of-fire of 10 to 12 rounds per minute and multiple-round simultaneous impact (MRSI) missions. MRSI is the capability of a single Crusader to generate four- to eight-round time-on-target engagements.

Major Donald L. Barnett is assigned to the Training and Doctrine Command Systems Manager for Cannons (TSM-Cannon) as a Crusader Combat Development Staff Officer at the Field Artillery School, Fort Sill, Oklahoma. In his previous assignment, he was a Doctrine Author on the Division Team in the Combined Arms and Doctrine Directorate of the Command and General Staff College, Fort Leavenworth, Kansas. He also served as a Brigade S3 and Brigade Fire Support Officer (FSO) Observer/Controller (O/C) for the National Training Center's (NTC's) Live-Fire Operations at Fort Irwin, California. His other O/C experience was serving as a Combat Service Support Trainer for the Fire Support Division at the NTC. In addition, he was the Battalion FSO for the 1st Battalion, 69th Armor and 4th Battalion, 66th Armor in the 3d Infantry Division (Mechanized), Germany. Major Barnett commanded Service Battery, 5th Battalion, 18th Field Artillery, part of the 75th Field Artillery Brigade in III Corps Artillery at Fort Sill.

SFC Gluck trains a potential 13D on AFATDS. (Photo by Kevin Tucker, Fort Sill TSC)

The Newest Field Artilleryman
13D FATDS Specialist

by Sergeant First Class William S. Gluck and Thomas D. Bradford

Like a freight train coming around the bend, the Army is rapidly developing command, control and communications (C^3) systems for the digitized force. These include FA tactical data systems (FATDS)—our advanced FATDS (AFATDS) is currently fielding to the total FA until 2007.

The FA's newest soldier will operate these C^3 systems from the lowest firing platoon through echelons above corps (EAC). He won't be a superman, but he'll be molded from the best of three Military Occupational Specialties (MOS): 13C Tactical Automated Fire Control Systems Specialist, 13E Cannon Fire Direction Specialist and 13P Multiple-Launch Rocket System (MLRS) Operations/Fire Direction Specialist. He'll be the newest member of the Field Artillery family: MOS 13D FATDS Specialist.

The FATDS Specialist coming on board in the first quarter of FY01 is actually a consolidation of MOS 13C and 13E. Additionally, in FY04, the Field Artillery School, Fort Sill, Oklahoma, will consider merging MOS 13P into MOS 13D. This delay affords MLRS training developers the opportunity to observe AFATDS in operation at MLRS units to determine the commonality of fire direction procedures in rocket/missile and cannon units and the feasibility of using the same MOS 13D FATDS operator for both.

Initially, the 13D FATDS Specialist was to consist of the 13C and 13P merger; however, in June 1999, a decision was made to shift to a 13C and 13E combination. The initial concept of the merger raised concerns regarding the movement of the 13D in and out of cannon and rocket units. With somewhat differing tactics, techniques and procedures (TTPs), this concept may have been too much for young soldiers to handle. Therefore, the decision to

maintain a cannon track with the 13E and 13C merger was the best approach.

This merger does not totally close down the 13C and 13E initial entry programs; they are scheduled to be taught through FY07. The courses will be phased-out based on the AFATDS fielding schedule and as requirements to maintain legacy system capabilities in units without AFATDS diminishes. (See the figure.)

With approximately 40 percent of the active force fielded and the first National Guard unit, the 45th Field Artillery Brigade in Enid, Oklahoma, to begin fielding in FY01, the need for the FATDS Specialist is overwhelming. This article discusses the training, fielding and duties/responsibilities of MOS 13D.

MOS 13D Training. Up until the formation of 13D, Field Artillerymen could receive AFATDS training only two ways. One, soldiers are trained by the AFATDS New Equipment Training Team (NETT) during a unit's initial fielding or delta training due to a new software release.

Second, soldiers could attend the Additional Skill Identifier (ASI) Y1/F9-producing AFATDS Operators Course or the AFATDS Command and Staff Course. (The F9 ASI is for MOS 13F Fire Support Specialist, Skill Levels 10/20/30/40, and 13R Field Artillery Firefinder Radar Operator, Skill Level 40, who also need to be AFATDS qualified.) The initial entry 13C, 13E and 13P soldiers who were identified as going to AFATDS units were held over after their advanced individual training (AIT) to attend the AFATDS Operators Course and be awarded the transitional ASI Y1.

Both options trained many soldiers on the basic operations of AFATDS, but neither focused specifically on a single MOS or soldier as an AFATDS and other FATDS primary operator. These same options are available through FY07. The NETT still will provide initial fielding and delta training. The 13C and 13E soldiers going through NETT will receive an operators course completion certificate that makes them qualified to apply for and receive the ASI Y1.

The issue of how to train currently fielded 13C (and quite possibly the 13P) soldiers in manual gunnery procedures is being looked at by the Field Artillery School. The proposed strategy is to have fielded units use a 13E to teach the prescribed manual gunnery tasks and certify the 13C can satisfactorily perform the tasks to standard to the first lieutenant colonel in the command.

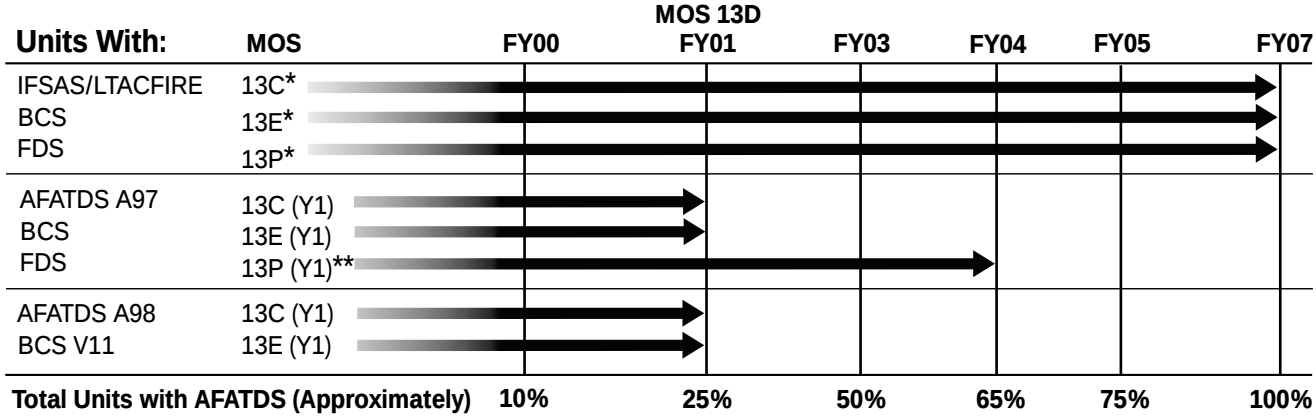
The Cannon Firing Battery Course 061-M70 and Fire Direction Level 1 Course 061-M82 are available through the Army Correspondence Course Program (ACCP), Fort Eustis, Virginia, to help prepare a 13C or 13P for cannon battery fire direction operations.

In the first quarter of FY01, the 13D AIT will begin training the new MOS soldiers in manual gunnery techniques and terminology, AFATDS setup and operations, doctrinal procedures, and then automated technical fire direction using AFATDS. MOS 13D AIT will be seven weeks and four days of instruction.

In addition, WIDD is developing TSPs for the new MOS 13D FATDS Specialist individual tasks. The 13D Skill Level 10 TSP will be available for downloading in FY01 and 13D Skill Levels 30 and 40 in FY02.

The AFATDS Operators (ASI Y1/F9) Course will expand to seven weeks in FY01. The expansion of the course is to compensate for those soldiers changing duty stations who haven't had manual gunnery training or technical fire direction training using the AFATDS device.

Fielding MOS 13D. The Army Recruiting Command reports two soldiers already have been recruited for the 13D



*In some units, MOS 13C, 13E and 13P will remain in their MOS and operate their legacy systems until the systems go out of the inventory in FY07 (AFATDS fully fielded).

**13Ps in some units using FDS will receive AFATDS training and the Y1 Additional Skill Identifier (ASI). In FY04, the decision will be made on whether or not 13Ps (Y1) will be consolidated into MOS 13D or continue as 13Ps for rocket units.

Legend:

13C = Tactical Fire Direction Specialist
13E = Fire Direction Specialist
13P = Multiple-Launch Rocket System (MLRS) Operations/Fire Direction Specialist
AFATDS = Advanced Field Artillery Tactical Data System
BCS = Battery Computer System
FDS = Fire Direction System
IFSAS/LTACFIRE = Initial Fire Support Automated System/Lightweight Tactical Fire Direction System
MOS = Military Occupational Specialty

Fire Direction MOS Consolidation into MOS 13D for Active and Reserve Components (AC and RC). By the first quarter of FY01, 13D FATDS Specialists will begin training in their new MOS; the MOS will be a consolidation of other fire direction MOS, as shown in the chart.

MOS with the big recruiting push to begin in April and May. This is to ensure soldiers arrive at Fort Sill in time for training in the fall.

To be eligible for reclassification to MOS 13D, a soldier must have had documented manual gunnery training, have been awarded the transitional ASI Y1 and be able to operate the battery computer system (BCS) functional software. If qualified, a soldier sends the appropriate documentation and a Department of the Army Form 4187 Personnel Action to the first colonel in his chain of command. Soldiers without manual gunnery and BCS training must complete NET on A99 software and manual gunnery task training before applying.

The Training and Doctrine Command (TRADOC) System Manager-Field Artillery Tactical Data System (TSM-FATDS) at Fort Sill is the proponent of the 13D program until FY01-02 when the program will transfer to the FA School's Warfighting Integration and Development Directorate (WIDD) and the Fire Support and Combined Arms Operations Department (FSCAOD).

13D Duties and Responsibilities. What is this soldier going to do? The following additions will be submitted by the FA School for inclusion in Department of the Army Pamphlet 611-21 Military Occupational Classification and Structure. The additions describe the development and implementation of the new MOS 13D. (The new MOS is part of Career Management Field 13, which is closed to women, per Chapter 10, DA Pamphlet 611-21.)

"Major Duties. The FATDS Specialist leads and supervises or serves as a member of an activity using FATDS in a Field Artillery cannon battery, battalion and higher. Duties for MOS 13D at each skill level are:

"*MOS 13D10. FATDS Specialist.* Performs operator, crew and organizational maintenance on section equipment. Drives section vehicle(s). Prepares fire direction center [FDC] for FDC tactical operations. Applies information to charts, maps and overlays. Performs AFATDS basic operations, to include initialization, cabling and removal. Integrates manual with automated fire direction procedures. Inputs initialization data and database information into AFATDS. Assists in performing AFATDS mission operations.

"*MOS 13D20. FATDS Sergeant.* Assists the Chief Fire Direction NCO in the supervision of all fire control operations in an FDC. Operates AFATDS at the platoon, battery, battalion and higher echelons. Performs computer operations, including fire mission processing, fire plan schedules and database management. Initiates computer center operations, including establishing control information, communicating with digital subscribers and initializing the database. Performs operator, crew and organizational maintenance on section equipment.

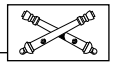
"*MOS 13D30. Chief Fire Direction NCO.* Assists the Digital Systems Administrator/Senior Fire Control NCO in the supervision of all fire control operations in cannon battery, battalion and higher echelons. Supervises fire direction operations, including preparations for operations, communications setup and maintenance. Orchestrates fire mission processing, fire support planning, fire support execution, movement control, FA mission support, FA fire direction operations, fires plan scheduling and entry of commander's guidance. Maintains current situation data. Performs troubleshooting of AFATDS hardware, software, database and communications to ensure continuity of operations. Oversees the performance of operator, crew and organizational maintenance on section equipment.

"*MOS 13D40. Digital Systems Administrator (Battalion and Above)/Senior Fire Control NCO (Brigade, Division and Corps).* Consolidates and manages ATCCS [Army tactical command and control systems] software, hardware and training within a cannon battery, battalion and higher echelons. Supervises and conducts fire support execution, movement control, FA mission support and FA fire direction operations. Directs troubleshooting of AFATDS hardware, software, database and communications to ensure continuity of operations. Directs and performs system administration and troubleshooting of ATCCS. Assists commander in fire control operations. Collects information for and presents briefings on current operations, situation and after-action reports. Enforces compliance with security procedures and regulations. Assists commander in planning, preparing and conducting individual and collective training for the unit."

The DA Pam 611-21 entry for the 13D40 brings new aspects to the job of a sergeant first class (SFC). For the cannon battalion and above, the 13D Digital Systems Administrator/Senior Fire Control NCO will work basically as an operations and fire control NCO all in one, a definite change.

The increasingly complex nature and path of the Army and the Department of Defense's digitization plans put pressure on the new FATDS Specialist and his leader to manage more and a wider variety of information than ever before. Besides operating the AFATDS system, the 13D must be more doctrinally astute than his predecessor. He must understand, analyze and then impart information to his command on the fluid battlefields of tomorrow.

The 13D must be multi-dimensional. Through his knowledge of manual gunnery, he must be able to visualize how the gunnery team works and how the rounds are supposed to respond; through his knowledge of automation, he must work as an information manager, moving and receiving information across the entire spectrum of the battlefield. He will be the key to the Field Artillery's remaining the King of Battle, regardless of whether we're providing close or deep fires.



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Thomas D. Bradford has been a Training Developer in the Training and Doctrine Command (TRADOC) System Manager for FA Tactical Data Systems (TSM-FATDS) at Fort Sill since April 1999. Prior to joining TSM-FATDS, he worked with Telos for five years as a Training Specialist, managing the development of training and training products for Firefinder radars. Mr. Bradford also spent five years as a Training Developer working in the Directorate of Training and Doctrine (DOTD) in the FA School at Fort Sill, primarily working on the Remotely Piloted Vehicle Program, but also one year developing training for the Small Aerostat Surveillance System (SASS).

ARNG Fire Support NTC Ramp-Up

by Captain Russell D. Johnson, ARNG

Throughout the past 18 long, hot hours, the combat observation lasing team (COLT) platoon leader had carefully planned and refined a detailed insertion and extraction plan. His execution matrix succintly defined the task, purpose, method and effect of each COLT mission and reflected detailed coordinations with the supporting helicopter battalion commander to strategically place the six COLTs deep in enemy territory. Midway through the combined arms rehearsal, the brigade S3 and the executive officer revised the entire brigade scheme of maneuver and directed the exhausted lieutenant to rework his plan.

This scene played itself out in late July 1998 under the grueling 122-degree heat of the Mojave Desert during a painful two-hour brigade combined arms rehearsal near the Whale Gap at Fort Irwin, California. The 116th Cavalry Brigade, an Army National Guard (ARNG) enhanced separate brigade (eSB) headquartered in Boise, Idaho, was preparing for another showdown against the famed opposing force (OPFOR) at the National Training Center (NTC).

Preparing for the showdown is not a simple undertaking. Any unit that has participated in a rotation at the NTC knows that preparations begin long before the first dual-purpose improved conventional munition (DPICM) round leaves the tube of a howitzer.

This article provides insight into how the 1st Battalion, 148th Field Artillery (1-148 FA) fire support teams (FISTs), COLTs, and the battalion and brigade fire support elements (FSEs) trained and prepared for an NTC rotation.

As a National Guard direct support (DS) artillery battalion (1-148 FA in Pocatello, Idaho) to an eSB, we face a number of inherent fire support training challenges. They include dealing with unit geographical separations, the need to stabilize positions, lack of 100 percent of authorized equipment and the demands of physical fitness and proficiency at basic soldiering and core collective tasks.

Geography. This is our greatest ongoing training challenge. Our current fire support architecture is spread over a four-state area with maneuver battalion FSEs in Montana, Oregon and southeast Idaho. Company FISTs are in Utah and southeast Idaho with the maneuver brigade FSE and cavalry troop FIST in southwest Idaho. The six COLTs are located in southeast Idaho with the headquarters battery. Bringing these fire support entities together for the train-up events was difficult, but not impossible.

Position Stabilization. Stabilizing crews across all fire support echelons also was challenging. Eighteen months before the NTC rotation, we identified officer and enlisted leaders who were

COLT members of the 116th Cavalry eSB move out after a battle at the NTC while SSG Pinzel (insert) observes OPFOR vehicles through MELIOS.

projected to remain in position throughout the ramp-up and the rotation. Once selected, leadership moves were frozen.

Manning in the task force (TF) FSEs and brigade FSE was doubled to provide 24-hour operations. This translated into two TF fire support officers (FSOs) and fire support NCOs (FSNCOs) per maneuver battalion and two brigade FSOs, FSNCOs and extra fire support specialists in each FSE. We accomplished this by cross-leveling personnel from our third maneuver battalion that didn't deploy to the NTC as an organic unit.

Selecting and stabilizing company COLTs and FISTs was equally challenging. Given the inherent dismounted and air-mobile mission of a COLT in a heavy brigade, four-man teams were established and led by experienced and knowledgeable NCOs. Additionally, we formed and trained eight teams instead of the traditional six. Leadership in the COLT platoon was provided by an experienced fire support lieutenant and a seasoned platoon sergeant.

The cavalry troop and armored company FISTs were manned at four soldiers while the mechanized FISTs were manned at six. Although selected crew turbulence occurred within the 18-month lock-in before the rotation, it was minimal; the teams deployed with essentially the same leadership that existed when the ramp-up began. The lesson is to lock crews down early and eliminate crew turbulence at the D-18-month mark.

Fire Support Equipment. Fire support equipment is always in short supply. Ground/vehicular laser locator designators (G/VLLDs), night sights, forward-entry devices (FEDs), mini eye-safe laser infrared observation sets (MELIOS) and associated cables headed our shortage lists. We used all available equipment from our third maneuver battalion's FISTs and battalion FSE.

Additional shortages were procured through out-of-state units, such as from the California mobilization and training equipment site (MATES) and the Mississippi ARNG. Cable shortages for the G/VLLDs, night sights, FEDs and FIST vehicles (FISTVs) were identified 24 months before the rotation and ordered through supply channels.

An aggressive and exhausting ramp-up preceded the NTC rotation and placed a high operational demand on the equipment. A comprehensive maintenance program involving calibration, preventive maintenance checks and services (PMCS), equipment cleanliness and leadership involvement ensured a 98 percent operational readiness (OR) rate on equipment before and during the rotation. Special care was taken to ensure any job-ordered item was followed-up on and promptly repaired. We could afford nothing less. MELIOS devices were procured through the 3-29 FA of

the 4th Infantry Division (Mechanized) from Fort Carson, Colorado, our Active Component (AC) counterpart.

Unlike our M109A5 howitzers that were railed from home station, we drew our fleet of M981 FISTVs from the draw-yard at the NTC. From our Leader Training Program and leader reconnaissance to the NTC before our rotation, we knew the vehicles had automotive and targeting head problems fleet-wide. To combat the inevitable, we brought a robust prescribed load list (PLL) from home station, consisting of high-demand parts, especially targeting head cables and automotive components (fan towers, radiators, track and suspension parts). Although these parts added a logistical burden to our log trains, they helped keep the fleet of FISTVs mission-ready. My recommendation for other National Guard DS FA battalions is to rail your FISTVs from home station.

The battalion railed all home station M577 CP carriers as we were equipped with the initial fire support automated system (IFSAS) and the draw fleet has mounts inside the CPs for the advanced FA tactical data system (AFATDS). This allowed the FSE crews to work from the same platforms they had trained with before the rotation. The distinct advantage of using home station equipment is simply this: you know what you have and the peculiarities of all associated systems.

Personal Fitness. Although soldiers of 1-148 FA are accustomed to training in a hot, desert environment, we realized the conditions at the NTC were nothing to ignore. Individual soldier physical fitness, a combat lifesaver certification program, an aggressive and systemic hydration program, safety training and certification and, most importantly, use of the buddy system were drilled into each of our crews and teams beginning 24 months out. Unit Army physical fitness test (APFT) and physical training programs all were reviewed and adjusted to prepare our soldiers better for the grueling 125-degree July heat and 20-hour workdays of the NTC in the Mojave.

Fire Support Training. The battalion had one annual training (AT) period and 36 inactive duty training (IDT) periods to prepare for its rotation in earnest. Soldiers trained a minimum of two weekends per month with leaders averaging three.

A typical yearly training cycle for the fire support sections of this brigade culminates with section qualification during its AT period. During IDT periods, the company FISTs and the COLTs train to section-level proficiency and normally participate in one maneuver company field training exercise (FTX) and one TF Janus exercise and (or) Battle Command Training Program (BCTP). The TF FSEs train the military decision-making process (MDMP) with their respective TF tactical operations centers (TOCs), as does the brigade FSE at least once per quarter.

AT periods are characterized by full integration at the company level for FISTs that often participate in company-level tank and Bradley qualification tables.

This all changed once our rotation to the NTC was cast in stone. Our train-up program was focused, challenging, realistic and compressed. A synopsis of the training programs associated with all fire support entities follows.

FISTs from the 116th Cavalry eSB refine and practice their digital and voice call-for-fire techniques in a live-fire exercise at Orchard Training Area, Boise, during AT.

Brigade and TF FSEs. Maximizing the time the FSEs spent with their habitual maneuver TOC was paramount to establishing both credibility and tactical proficiency within these critical sections. In the 18 months preceding our rotation, each TF conducted four tactical Janus exercises, two brigade-level Janus exercises, one tactical battalion-brigade simulation (BBS) exercise and one brigade-level fire control exercise (FCX) involving company FISTs, COLTs, TF FSEs, the brigade FSE and the battalion FDC section.

At each exercise, the digital systems from sensor-to-shooter were exercised with emphasis on FM viability involving at least two retransmission stations. This architecture allowed us to identify and flush out a host of gremlins that inherently plague digital links on the mobile and unforgiving battlefield.

All exercises were conducted tactically from assigned M577 CPs with added emphasis on NCO involvement in battletracking, pre-combat checks (PCCs) and full-system integration from the brigade down to the company levels. These exercises not only involved the execution of a tactical order previously written by the respective staffs, but also incorporated a planning phase whereby the plans staff produced an order for the successive tactical exercise. The staffs were kept very busy and consumed many rolls of acetate.

Brigade COLTs. "Compared to the standard, they may be the best we've ever seen." This was a statement made by Brigadier General Dean W. Cash as Commanding General of the NTC (taken from the article "Closer Look at Enhanced Brigades" by Brian R. Calvert, *National Guard,* September 1998.) Obviously, the COLT training and mission planning worked.

No other fire support entity carries the weight of the brigade's mission success as do the COLTs. Special emphasis was placed on these critical fire support sections from the D-24-month mark.

Yet, the current modified table of organization and equipment (MTOE) does little to provide these teams the equipment and manning required to accomplish the do-or-die mission for the brigade commander. To fix this, the fire support coordinator (FSCOORD) directed four-soldier teams be established with each member having an area of expertise different from any another. Although not doctrinally correct, we established eight, four-man teams com-

manded by a seasoned platoon leader and platoon sergeant.

Each team member brought something unique to the team. Although all were Military Occupational Specialty (MOS) 13F Fire Support Specialist trained and qualified, one soldier was a combat lifesaver (a medic in a previous life), one was a communications expert, one was a small-unit tactics and weapons expert and one was smart on all fire support systems, such as the G/VLLD, FED and associated support hardware (night sights, hand-held laser rangefinders and the precision lightweight global positioning system receiver, or PLGR). Teams were trained on the UHF and AM radios carried by their enlisted tactical air controller (ETAC) brethren, and many were trained on the enemy's order-of-battle, his engineer tactics and identifying his obstacles.

During the AT before our NTC rotation, the COLTs deployed to the NTC to augment the 3-29 FA during its NTC rotation with the 3d Brigade, 4th Division. From this, our COLTs gained valuable tactics, techniques and procedures (TTP) and experience they could obtain no where else.

During the home-station training that followed, they built on the lessons learned and applied new twists to doctrinally sound practices. They honed their survivability skills, marksmanship and field craft, air insertion and extraction techniques and physical fitness. Whenever possible, the platoon trained together and developed a unique cohesiveness inherent to well-trained organizations.

Our home station training program included a one-week close air support exercise (CAS-EX) involving the COLT platoon and elements from the 116th Tactical Air Control Party–Flight (TACP-F). Throughout this unique training event, the COLTs received one-on-one training with their ETAC counterparts and called-in the nine-line mission taskings to A-10 and F-15 aircraft in a live-fire scenario. Their precision with terminal air control practices improved steadily throughout the exercise and culminated with a UH-60 helicopter insertion and extraction to observation posts (OPs) throughout the live-fire aircraft range. From their OPs, our COLTs called in precision air strikes against columns of enemy armor with a 95 percent success rate.

The COLT platoon leader's training program included more than command and control of the platoon. He participated in two Leader Training Program exercises at Fort Irwin as well as a staff ride/simulation exercise conducted in the central corridor of the NTC at D-4 months. Participation in all brigade-level Janus exercises and the FCX allowed him to refine TTP associated with the COLT planning process and the implementation of a new COLT standing operating procedures (SOP). Contingency planning and his involvement in the brigade counterreconnaissance execution plan contributed greatly to the COLTs' effectiveness at the NTC.

- Survivability
- M981 Fire Support Team Vehicle (FISTV) Operations Including Targeting System Control Display (TSCD) Operations
- Planning and Executing Fires at the Company Level
- Call-for-Fire (CFF) Proficiency
- Dismounted FIST Operations
- Trigger Planning and Execution
- Enemy Order-of-Battle and Vehicle Identification
- Single-Channel Ground and Airborne Radio System (SINCGARS) Proficiency
- Mortar Planning and Employment

1-148 FA FIST Command Certification Areas

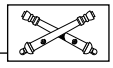
Company FIST. Full and consistent integration with maneuver and basic 13F skill proficiency were key to the success of our nine company and troop FISTs. FIST teams participated in all Janus exercises, the FCX, and tank and Bradley qualifications (Tables XII) in the 18 months preceding the rotation. The teams aggressively practiced survivability and movement tactics in offensive scenarios and sustained their call-for-fire (CFF) proficiency during battalion live-fire exercises (LFXs) and through the use of the guard unit armory device, full-crew interactive simulation trainer (GUARDFIST). The cavalry troop FIST deployed to Fort Knox, Kentucky, to participate in a troop virtual training program (VTP) at D-8 months and learned valuable skills in providing effective and lethal fires in support of the cavalry troop's inherent brigade missions. All FISTs were command-certified in the areas shown in the figure before deploying to the NTC.

Training focused on planning digitally and executing by voice. The battalion IFSAS and FED SOPs were scrubbed and refined constantly along with the company fire support SOP. Final copies were still warm from the printer when the troops landed at the NTC. Equipment maintenance was stressed with a focus on operating in a hot, dry environment.

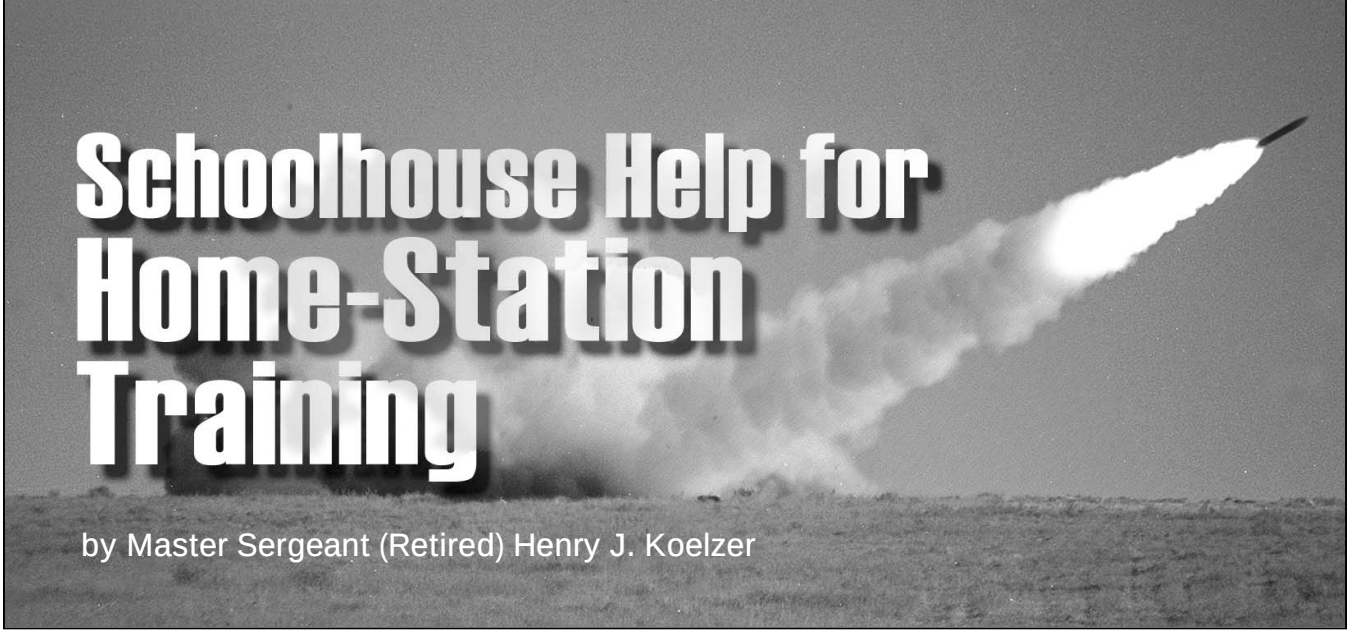
The FSCOORD directed that battalion turret mechanics organic to the headquarters and headquarters battery (HHB) be pushed down (attached) to the two maneuver TF maintenance platoons during the rotation. This not only facilitated a reasonable turn-around at the unit maintenance collection points (UMCPs) for the FISTVs, but also provided a dedicated liaison between the logistical trains of the FA battalion and the two maneuver TFs. This proved very wise as both TF FSOs and the FSCOORD fought from FISTVs during several force-on-force battles.

Final Thoughts. A great deal of the unit's success would not be possible without the magnificent support provided to the soldiers by families and employers. We would not be able to fire a single round without them.

An effective combat training center train-up is a challenging and rewarding team effort. Soldiers are asked to contribute an average of three weekends a month and often four. It's tough business and requires the dedicated efforts down through the ranks from the battalion commander to the newest private. Effective leadership has no known substitutes.



Captain (Promotable) Russell D. Johnson is the S3 for the 1st Battalion, 148th Field Artillery, a National Guard direct support (DS) FA battalion headquartered in Pocatello, Idaho. His previous assignments include serving as a Task Force Fire Support Officer for the 2d Battalion, 116th Cavalry, part of the 116th Enhanced Separate Brigade headquartered in Boise, a position he held before and during NTC rotation 98-09; C Battery Commander, also with the 1-148 FA; and Commander of the 129 Engineer Company (Separate) in southeast Idaho. Captain Johnson is a graduate of the Combined Arms Staff and Services School, Fort Leavenworth, Kansas, and holds a Master of Science in Biological and Agricultural Engineering from the University of Idaho.



Schoolhouse Help for Home-Station Training

Photo by Henry J. Koelzer

by Master Sergeant (Retired) Henry J. Koelzer

As the operations sergeant of a multiple-launch rocket system (MLRS) battalion in III Corps Artillery, Fort Sill, Oklahoma, seven years ago, I spent weeks preparing a plan to conduct an MLRS platoon lane training exercise. The number of planning hours easily exceeded 400. The exercise lasted 96 hours and culminated with a live-fire event.

The exercise ended successfully, and the MLRS platoons received some quality training. However, today, I could plan a 96-hour quality training event in the same amount of time the training event would take. I could do it by taking advantage of schoolhouse digital products and systems for unit training.

This article discusses the products available on the Internet to give FA units the most up-to-date task data, strategies and support packages to save them time and money in unit training.

Standard Army Training System (SATS). The Army has spent millions of dollars developing SATS software. By using SATS, units can import database files that contain mission training plans (MTPs), soldier training publications (STPs) and combined arms training strategies (CATS). Most units already use SATS, the preferred method for obtaining task data to produce training schedules and develop mission-essential task lists (METLs).

A plan to conduct unit training begins with selecting a set of tasks to train. When a unit imports an MTP into its SATS database, it not only gets the collective tasks data, it also gets the individual tasks that support them. Planners have the option of massaging the tasks to make them fit their specific situation or using them as they exist. More importantly, the tasks may be used to develop training events and training plans.

All six of the FA MTPs are available digitally for download now; however, they are being updated, and the latest versions of all the MTPs will be available in May. The MTPs may be downloaded from the web site of the Warfighting Integration and Development Directorate (WIDD) at the Field Artillery School, Fort Sill. Units also will be able to download the task data for import into SATS via the Training and Doctrine Command (TRADOC) Reimer Digital Library Data Repository or TRADOC Reimer Digital Library. (See Figure 1 for resource web sites.)

The following are the Army Training and Evaluation Program (ARTEP)/ MTPs for FA units: 6-102 FA Brigade, Division Artillery and Corps Artillery; 6-115 Cannon Battalion; 6-395 MLRS Battalion; 6-037-30 Consolidated Cannon Battery; 6-397-30 MLRS Battery; and 6-303-30 Target Acquisition Battery and Detachment.

The six MTPs have a total of 380 collective tasks. During the past year, WIDD reviewed and staffed the 380 tasks in the MTPs worldwide to ensure they reflect current equipment, doctrine and force structure.

WIDD task development efforts now are centered on two initiatives. One is developing tasks for the first digitized division, the 4th Infantry Division (Mechanized) at Fort Hood, Texas. This effort will pay big dividends as the Army battle command system (ABCS) matures and more units are fielded with the advanced Field Artillery tactical data system (AFATDS). WIDD also is focused on developing tasks for the initial brigade combat team (BCT) to be on the ground for training at Fort Lewis, Washington, this fall. In addition, WIDD has started working on M270A1 MLRS launcher and Bradley fire support team vehicle (BFIST) collective tasks.

SATS has many capabilities and, if used properly, will greatly help a commander train his unit.

Warfighting Integration and Development Directorate (WIDD) Home Page: http://155.219.39.98/widd/
WIDD Unit Training Site: http://155.219.39.98/doctrine/wddfrm.htm
Training and Doctrine Command (TRADOC) Reimer Digital Library: http://155.217.58.58/atdls.htm
TRADOC Reimer Digital Library Data Repository: http://155.217.58.100/
TRADOC Combined Arms Training Strategies (CATS) Site: ftp://ftp-dcst.monroe.army.mil/CATS/armycats.htm
Army Training Support Center (ATSC) Help Site: http:// www.atsc.army.mil/helpdesk/
Standard Army Training System (SATS) Help Site: http://www.atsc.army.mil/helpdesk/trainingmanagement/sats/index.htm

Figure 1: Fort Sill and TRADOC Internet Assistance for Unit Training

Combined Arms Training Strategies. FY99 saw the development of the final CATS for all types of FA units (except the digitized Div Arty and the initial BCT being developed this year).

CATS performs much of the critical planning required for many training events. It identifies tasks trained in specific types of events and the resources required, including estimates for fuel and ammunition consumption. The estimates and task lists, while based on some units' actual situations, will not satisfy every unit's needs. Each commander will have to massage the CATS task list and estimates to reflect his unit's METL.

CATS also gives the commander an overview of a complete training strategy. It allows new commanders to access the experience of previous commanders, hopefully making the learning curve a little gentler.

Units may obtain FA CATS on the WIDD home page or on the TRADOC CATS web site that includes all Army CATS. Both sites have CATS in Microsoft Word. CATS also may be downloaded into a database format from the TRADOC Reimer Digital Library Data Repository and imported into SATS. Once in SATS, however, units cannot modify the data and save the information as a training event. This will change with the release of SATS 4.2 in June.

SATS 4.2 will give planners an easy way to create training events and short- and long-range training plans with specific events, including tasks and resources. It will add a new dimension to planning—no more filing cabinets filled with paper documents needed to support training. CATS strategies can help commanders plan training and visualize a complete unit training strategy.

The ultimate training tool, a training support package (TSP), will give commanders all they need to plan, say, an MLRS lane training event, in a few days rather than in weeks. The Field Artillery School is developing TSPs for different training events in support of CATS. One TSP may support several CATS events.

The TSPs list tasks to train, master events lists, databases, resource and controller requirements, as well as operations orders and scenarios—a complete package.

The WIDD has completed two TSPs—Paladin and MLRS section certification—which are in Microsoft Word format in a zip file for easy downloading off the WIDD home page. Fourteen other TSPs are under development and are scheduled to be released at various times before the end of the fiscal year (see Figure 2). Upcoming TSPs will include digitized maps and digital scenarios and master events lists that can be downloaded directly into the digital systems test and training simulator (DSTATS). Some units will be asked to help review and test these TSPs.

As helpful as they are to units, the TSPs will not be off-the-shelf, ready-to-use products. WIDD cannot develop a TSP that will satisfy every unit's requirements or situation. All resource requirements defined in the TSP are an estimate based on a perfect situation, which most units do not have, and must be tailored to fit each unit's specific situation and location.

The greatest help for units will come from the scenarios, event lists and controller packets in the TSPs. Training planners may have to substitute grid locations found in the TSPs with the grid locations of their local training areas, or master events lists may require modification to meet specific training goals. Regardless, the TSPs will shorten planning time considerably.

The products described in this article will help leaders by giving them digital tools to shorten planning time and by giving them a centralized source of the most up-to-date task data, strategies and support packages for unit training. These products will support quality unit training, helping to guarantee the future effectiveness of the force.

Title	Expected Release
105-mm Towed Section Certification	3d Qtr 00
155-mm Towed Section Certification	3d Qtr 00
Multiple-Launch Rocket System (MLRS) Battalion Fire Direction Center (FDC) Exercise	3d Qtr 00
155-mm Self-Propelled Howitzer Battalion FDC Exercise	3d Qtr 00
155-mm Self-Propelled Howitzer Battalion Platoon Operations Center (POC) Certification	3d Qtr 00
Maneuver Brigade Fire Support Element (FSE) Exercise (155-mm Self-Propelled Battalion)	4th Qtr 00
Maneuver Battalion FSE Exercise (155-mm Self-Propelled Battalion)	4th Qtr 00
Maneuver Battalion FSE Exercise (105-mm Towed Battalion)	4th Qtr 00
Maneuver Company Fire Support Team (FIST) Exercise (155-mm Self-Propelled Battalion)	4th Qtr 00
Maneuver Company FIST Exercise (105-mm Towed Battalion)	4th Qtr 00
FA Brigade Command Post Exercise (CPX)	1st Qtr 01
Division Artillery CPX	1st Qtr 01
MLRS Battery External Evaluation (EXEVAL)	1st Qtr 01
155-mm Self-Propelled Battalion EXEVAL	1st Qtr 01

Figure 2: FA Training Support Packages (TSPs). As projected for release in this chart, these TSPs will be available on the Warfighting Integration and Development Directorate (WIDD) Unit Training web site: http://155.219.39.98/doctrine/wddfrm.htm.

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