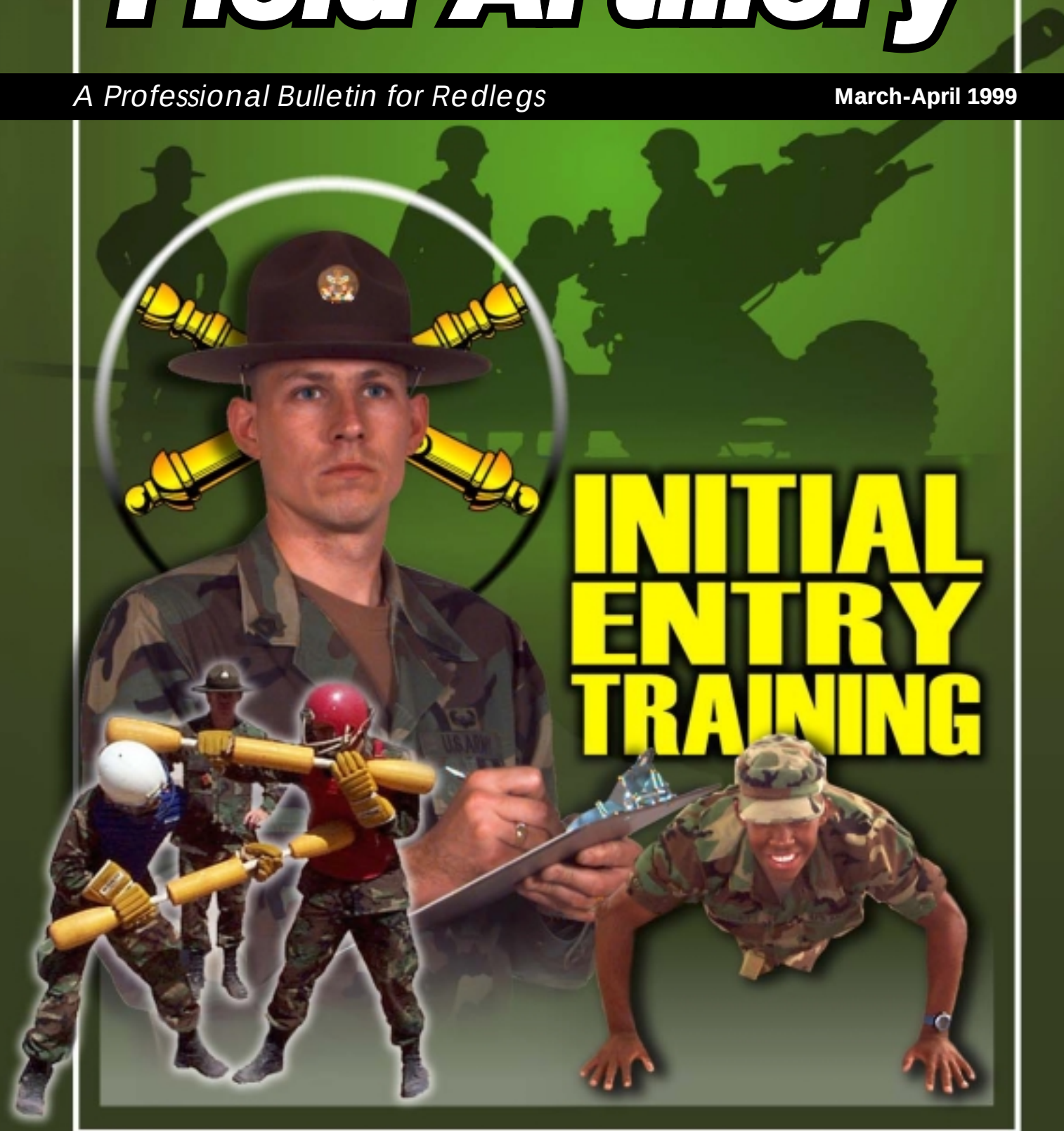
Field Artillery

A Professional Bulletin for Redlegs

March-April 1999



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HQDA PB6-99-2

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Front Cover: SFC Thomas M. Easterly is Drill Sergeant of the Year for the FA Training Center (FATC) at Fort Sill, Oklahoma. He won the award while serving as Drill Sergeant in D/2-80 FA. Currently, he is the Senior Drill Sergeant for the Cadre Training Course at FATC.

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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SUBMISSIONS: Mail to Editor, ***Field Artillery***, P.O. Box 33311, Fort Sill, OK 73503-0311. Telephone numbers are DSN 639-5121/6806 or commercial (580) 442-5121/6806 or FAX 7773 with DSN or commercial prefixes. Email is famag@usafas.army. mil. Material is subject to edit by the ***Field Artillery*** staff; footnotes and bibliographies may be deleted due to space limitations.

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ADDRESS CHANGES: ***Field Artillery*** (ISSN 0899-2525) (USPS 309-010) is published bimonthly. Periodicals postage is paid by the Department of the Army at Lawton, OK 73501 and an additional mailing post office. POSTMASTER: send address changes to ***Field Artillery***, P.O. Box 33311, Fort Sill, OK 73503-0311.

Redleg Hotline
(Organization, Materiel, Doctrine and Training)
DSN 639-4020 or (580) 442-4020 (24-Hour)

Tactical Software Hotline
DSN 639-5607 or (580) 442-5607 (24-Hour)

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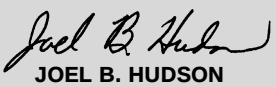


JOEL B. HUDSON
Administrative Assistant to the Secretary of the Army, 05279

Leo J. Baxter
Major General, United States Army
Field Artillery School Commandant

Editor:
Patrecia Slayden Hollis

Assistant Editor:
Linda L. Ritter

Art Director:
Bob T. Coleman

MAJOR GENERAL LEO J. BAXTER
Chief of Field Artillery

IET: Where Values and Excellence Begin

It seems that almost everything you need to know in the Army is taught in basic training. Making your bed six times in an hour teaches you that neatness and discipline count. Having confidence in the person carrying a deadly weapon behind you at night teaches trust. You are trained to do unbelievable things outside, in the rain and in the dark. Respect is never simply given but must be earned. And to be a good leader, you must first be a good soldier.

So I was pleased when, in October 1998, the Army expanded basic combat training (BCT) to nine weeks. This added time allows our soldiers to learn the necessity of healthy human relationships and the value of teamwork plus boosts their physical fitness. Most importantly, this extra week allows time for inculcating the seven core Army values in our new soldiers—loyalty, duty, respect, selfless-service, honor, integrity and personal courage. These values help them make ethical decisions and be successful in an Army that reflects the complexity of American society.

Don't think for a moment that "basic" has gone "soft." Soldiers still spend endless hours on the drill pad and in physical training; they still qualify with their M-16s; they still throw hand grenades and learn to fight with "cold steel" bayonets and pugil sticks. They do everything soldiers have done for generations: things that will keep them alive and bring us victory in any contingency. We've just added needed training to their already *full* schedules.

And we recognize the completion of basic training and the transformation of civilians into soldiers with distinctive and memorable rites of passage. The public ceremony of graduation day—with traditional martial music, awarding of training certificates and nearly constant flashing of family camera strobes—demonstrates to the world that another American generation is prepared to selflessly serve our country. The Warrior field training exercise (FTX) seldom seen except by those directly involved with it is a more private rite of passage that proves soldiers' abilities as fighters and their loyalty to comrades and our proud Army heritage. Trainees who complete the exercise's four grueling days will tell you that BCT in *no way* resembles movies such as *Private Benjamin, Stripes* or *In the Army Now*. Basic at Fort Sill is tough, is based on real-world demands, but above all, is a source of deep pride for those who complete it. And it's a great source of pride for me.

FATC, Fort Sill, OK

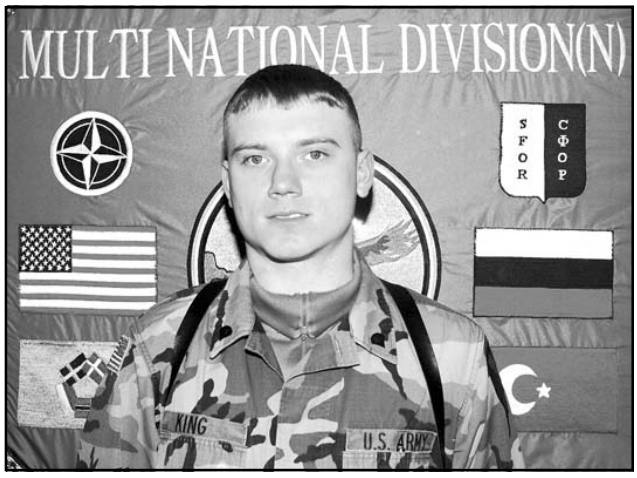
Gender-Integrated Training (GIT)

With an increasing number of young women entering the Army and with the closure of Fort McClellan, Alabama, another post needed to assume the GIT mission. Our Army leaders didn't have to look far to find a post where excellence and professionalism have been the standard for years: *Fort Sill*. This May, Sill will become the Army's newest gender-integrated basic training installation—a great, new, challenging mission for our leaders.

Only 25 to 30 women soldiers currently train annually at Fort Sill, and that's limited to advanced individual training (AIT) as FA Meteorological Crewmembers, Met Equipment Repairers, Radar Repairers, and FA Surveyors. We'll experience an enormous change when nearly 2,500 women arrive for BCT this summer with an expected peak of approximately 5,000 women in FY 2000. After successfully completing BCT, these women will enter a variety of AIT programs at other posts with a small number remaining here for the AIT courses mentioned.

Our total basic trainee population will remain at 13,000 to 14,000 per year with female trainees comprising about 40 percent of new recruits. The one-station unit training (OSUT) program we have for nearly 4,000 Cannon Crewmen a year will be unaffected by this change because that specialty remains closed to women by law.

There will be significant changes to the look, but not the rigor or quality of training at Fort Sill in the coming months. Instead of just three women drill sergeants, we'll have about 50 by June. We'll spend between three and four million dollars renovating billets to provide IET soldiers separate and secure quarters. Of course, Reynolds Army Community Hospital, the Central Issue Facility and Army-Air Force Exchange Service (AAFES) retailers will change their inventories, personnel and services to meet the needs of the changing ratio of women to men. But in spite of these alterations, one thing that won't change at Fort Sill is our commitment to Army values.



Today, Jarred King is a Specialist and is still with 1-82 FA in Bosnia.

A "King" of Battle

Perhaps you've heard the story of how crucial Army values can be in a crisis and the proud Redleg who demonstrated he lived those values. In December 1998, US troops arrested Serbian Major General Radislav Krstic for war crimes he allegedly committed in Bosnia. Tension was high in that war-torn country, and at ground-zero was one American soldier: Private First Class Jarred H. King.

PFC King is a FA Surveyor assigned to the 1st Cavalry Division's 1st Battalion, 82d Field Artillery. PFC King suddenly found every aspect of his Army training tested when a squad of angry Serbian militiamen surrounded his vehicle, loaded live ammunition into their AK-47s and demanded he hand over his weapon. Drawing on his innermost resolve, he found the personal courage to hold his ground in the face of danger. Refusing to surrender his M-16, he stood toe-to-toe with his aggressors, remembering his duty as a member of the most respected fighting force in the world: the United States Army. Eventually, his steadfast obedience to orders and his adherence to a mission he knew was right caused the Serbs to back down.

"I just did what I was trained to do," said King. "It was common sense." By remaining loyal to our Army values, by remembering his training, this Field Artilleryman demonstrated to those militiamen that mere intimidation will neither dissuade us from our duties nor cause us to abandon our values.

Loyalty, duty, selfless service, personal courage—PFC King demonstrated four of the Army's seven core values. Perhaps these values were instilled in PFC King by his parents, teachers, and spiritual leaders before he joined the Army—perhaps they were reinforced during his initial entry training (IET).

At any rate, these values keep our Army strong and our nation free. These values are taught and lived every day at Fort Sill where soldiers come to learn what *right* looks like.


With the introduction of GIT to Fort Sill's BCT this summer, there will be significant changes to the look, but not the rigor or quality of training at Fort Sill in the coming months.

Lieutenant General William J. Bolt, Deputy Commanding General of the Training and Doctrine Command (TRADOC) for Initial Entry Training (IET)

IET: Starting the Soldier Out *Right*

Interview by Patrecia Slayden Hollis, Editor

Q *Secretary of Defense William F. Cohen issued guidance to all the services in March 1998 to improve basic training in the military, including placing more emphasis on values during basic training. As a result, Chief of Staff of the Army General Dennis J. Reimer instituted a program to inculcate into trainees the seven Army values: loyalty, duty, respect, selfless service, honor, integrity and personal courage. Why do we need values training?*

A The need to *reemphasize* our values became apparent with the DA IG [Department of the Army Inspector General] investigations following the drill sergeant scandal at Aberdeen [Proving Ground, Maryland] and other posts. The investigation comprehensively reviewed the entire training base and came up with recommendations for the Secretary of the Army and Chief.

Now, note that I said "reemphasize our values." Since the beginning at Valley Forge and throughout our history, the Army clearly has been a values-based organization. We've always held core values; we just stopped talking about them. So the question really is, "Why, *now*, do we need to reemphasize our core values—need to institute values training?"

To answer that question, I can only give you my opinion. We, the United States Army, have grown into absolutely the most competent Army in the world and have been developing that competency for a period of time—an example is our remarkable achievements in the desert [Operations Desert Shield and Storm]. I think we started judging and relating to one another professionally based too much on pure competency. "Duty," including knowing how to perform in a very competent manner, has been and should be one of the core Army values. But, in my opinion, the "competency pendulum" swung to its pinnacle and began to overshadow our other values.

General Reimer called for a renewal of values inside the training base and the Army as a whole. In IET, we train new soldiers on the core values and what is expected of them in a values-based organization—set the standards of conduct for membership in the US Army.

Q *How do we inculcate values into new soldiers who are already adults? How do we ensure they adopt them—abide by them?*

A First, we formally identify the seven cores values for which they will be held accountable. Then we ensure their entire leadership, drill sergeants and training center cadre, model those values in all they do. Next we build in those values as part of the training process—make them relevant to the challenges the soldiers are going through in the training experience.

Let me give you some examples of relating values to the soldiers' personal training experience. How soldiers interact with each other during training clearly speaks to "respect." Not showing respect for someone else is not just a discipline issue, it's also a values issue. When a soldier doesn't show respect for someone's opinion or belittles others because of race, religion or whatever, then his drill sergeant calls him on it. The drill sergeant points out that the Army values "respect for others"—that that's how we build cohesive teams with members who take care of each other and get the job done in combat. Another example—at mile three early on a cold morning at week two of basic training, it takes personal courage and commitment to keep running and keep developing your physical conditioning—to give 100 percent. Drill sergeants relate our core values to what the new soldiers are doing in each phase of their training.

The drill sergeants and cadre also routinely tell soldiers about the traditions and history of the Army and their branch, giving the soldiers pride in their profession. Soldiers eating in a mess hall or training on a range named after a Medal of Honor recipient hear the story of the values the hero exhibited in service to his nation.

At Fort Sill, the Field Artillery Training Center combat obstacle course is named after forward observer Tech5 Forrest E. Peden from the 10th FA Battalion, who earned the Medal of Honor for his actions in France during World War II. He earned our nation's highest military award by living Army values to the ultimate as summarized in a citation that outlines his heroic display of honor, duty, respect, selfless service and personal courage.

So, drill sergeants give the history of and mentor their soldiers on the Army values—and counsel the soldiers to hold them accountable for exhibiting those values. Basic training soldiers must dem-

"Basic training soldiers must demonstrate our seven core values as a condition for continued service in the Army."

onstrate our seven core values as a condition for continued service in the Army.

The fact is, nobody gets out of basic training unless his drill sergeant says he understands and has accepted the values of this organization. And the drill sergeant knows; he has had the soldier for nine weeks in basic training or for some 14 weeks in OSUT [one-station unit training] or for an extended period in AIT [advanced individual training].

Q *Is the values training paying off—what are the indicators?*

A *Absolutely* paying off. The indicators are that soldiers take to it. They like to talk about values and put them into the context of their life experiences. The second payoff is that our drill sergeants and cadre are striving to model the very highest standards; they know the soldiers will call them on it if they don't, no doubt about it.

The third indicator is a behind-the-scenes story on how well it's all working. One of the school commandants talked with a couple of restaurant and hotel owners from his downtown area who reported his young soldiers were more courteous and that discipline problems downtown had "evaporated." In IET, we're reemphasizing Army values and teaching soldiers how to conduct themselves in relation to those values.

Q *Instilling values in basic training has been coupled with higher standards in other areas of IET. What are they and how do they contribute to producing better soldiers? What has been the impact?*

A As of 1 October 1998, we added a week, 54 hours, to basic training. We upgraded PT [physical training] and added some human relations and values training, which are embedded throughout the course. The drill sergeant now has more time for face-to-face contact and to conduct sensing sessions and do after-action reviews with his soldiers.

It used to be that many basic training graduation requirements were more easily waived; the soldier didn't *have* to complete all of them to graduate. The requirements were all in the POI [program of instruction], but if a soldier was sick, injured or otherwise not available for training that day, the drill sergeant did not have to make that training up.

Basic training has about ten categories of mandatory requirements, and although the requirements have always been in the POI, they now cannot be waived. Today, the soldier doesn't graduate until the drill sergeant raises his hand and says the soldier has met all the requirements. Graduating from basic training is more difficult.

So what has been the impact? The IET attrition rates have risen from our traditional 15 percent to almost 19 percent. The basic training attrition rate rose while the AIT attrition rate went down. The OSUT attrition rate stayed about the same (OSUT has the same graduation requirements for its basic training portion). So we began to focus our attention on reducing the attrition rate in basic training.

We now realize we did a dumb thing. We rewrote 350-6 *[TRADOC Reg 350-6 Initial Entry Training Policies and Administration]* to focus on recycles, new starts—giving the soldier a lot of opportunities to recycle for success. But we conducted an "autopsy" on the attrition rate and found out we miscalculated what the soldier needed.

We thought that a soldier who volunteered for three or four years in the Army wouldn't be concerned about "a few more weeks" in basic training. *Wrong*—a major concern. Leaving one platoon and going to another platoon is a big issue.

The platoon is critical—it has synergy. The soldier is part of a team, and each soldier is sure his team is the best in the Army. He sees his drill sergeant as the key to his success—as he should. And he doesn't want to leave all that for the "unknown."

So, instead of recycling the soldier early or more often, we're keeping the platoon cohesion as long as we can and putting more responsibility on the chain of command and drill sergeant to reschedule a training event or retrain individuals. They now push the soldier to keep him with his platoon.

Then if the soldier still hasn't met all the graduation requirements, he knows that when he restarts at the end or late in his cycle, he only will have to train on and pass a few events before he, too, can graduate from basic training.

With these changes, emerging data indicate we should be able to roll the basic training attrition rate back to the historic norm while maintaining the improved AIT attrition rate. And we should be able to do that without relaxing the newly increased training rigor and higher standards in basic training.

Q *Secretary Cohen also directed military training centers institute training to produce professional relationships between the genders. How is the Army implementing that directive? What are the advantages of gender-integrated training (GIT)? What are the challenges?*

A How are we doing it? With values training. And we're training with one set of standards and one set of requirements for graduation—male or female.

If you asked me whether or not soldiers show up the first day of IET understanding teamwork, I would say, "Absolutely not." Everyone comes to our Army looking for an individual opportunity. Each has to sort out that he or she must be a team player to succeed in the Army.

And depending on the MOS [military occupational specialty], the male-female composition of that team varies. If the soldier has a combat MOS, he's not

"...we're training with one set of standards and one set of requirements for graduation—male or female."

going to have women in his unit. But if the MOS is combat support or combat service support, the soldier could serve in a unit that has a ratio of as high as 30 percent women. More than 90 percent of our MOS are open to women and about 60 percent of our units. In those MOS, the soldier can count on spending the rest of his or her career working with members of the opposite sex.

In 1994, when I first came to Fort Jackson [as commanding general of the IET installation in South Carolina], we were training women separately from men. I observed two phenomenon. First, at that time, women didn't make the same commitment to the profession as men—they didn't challenge one another enough or as much as the male trainees challenged each other. Second, the male trainees did not think the women were being trained as hard—that the drill sergeants weren't as tough on them. The POI was the same, the drill sergeants were the same, but we couldn't dispel the perception.

Then ARI [Army Research Institute] conducted a one-year study evaluating gender-integrated training at both Forts Jackson and Leonard Wood [Missouri]. The result was that women training with men performed better in most measurable categories–had better PT scores, shot the rifle better, had higher scores on end-of-cycle testing, etc. And the standards were the same for men and women—road marches, pugil stick training, bayonet assault, hand grenades and the other requirements. (The one exception is the PT test is gender-normed to account for the physical differences of the sexes.) The study also found that the male trainees' performance was not degraded in gender-integrated training.

So if the soldier is going to be assigned to a male-only organization, combat arms, then he has a male-only training experience through basic and AIT. If, in fact, the soldier will be part of a gender-integrated MOS or organizations, he or she is trained from the first day through AIT in that environment.

The challenges we face in gender-integrated training are to build respect for one another and to arrange housing that provides privacy for both sexes yet allows them to train daily together.

If you ask new IET graduates who are going into organizations that are gender-integrated, you'll find it's not an issue. They're willing to train and work together as a team. That tells us we've overcome the gender integration training challenges in IET.

"When the drill sergeant takes personal responsibility for the quality of training, for the success of his soldiers, then the Army ends up with great, great soldiers."

Q *How important is the drill sergeant in developing trainees?*

A The drill sergeant is the key. Civilians become soldiers through contact with their drill sergeants.

And when a soldier looks at his drill sergeant and says, "That's what I want to be in the Army," the soldierization process has occurred. No one *ever* forgets his drill sergeant.

I have a story I tell drill sergeants. I was at the reception battalion at Fort Jackson, and soldiers in the battalion's fitness training unit had just finished morning PT. Their drill sergeant was talking to them about things they needed to know for basic training, such as their chain of command. I was on my way to a drill sergeant graduation, but I listened for a little while.

I stayed for lunch at the reception battalion after the graduation ceremony. In the chow line, I spotted one of the soldiers the drill sergeant had been working with in the fitness training unit. So I asked the soldier how he was doing and what he had learned from his drill sergeant about his chain of command.

I expected him to give me a long list: company commander, battalion commander…maybe even me and the TRADOC [Training and Doctrine] commander. He looked at me for a moment and then said, "Sir, my chain of command is Drill Sergeant Randall and the President of the United States."

Well, he left a couple of people out, but from his perspective, he was right. Everything he had signed and every oath he had taken had named the President of the United States as his Commander-in-Chief; and everything he did—got up, went to chow, trained and went to sleep—was directed by Drill Sergeant Randall, who also told him when he was doing a good or bad job of it.

So, what's the impact of the drill sergeant? When the drill sergeant takes personal responsibility for the quality of training, for the success of his soldiers, then the Army ends up with great, great soldiers.

The Army is selecting only the top for drill sergeant duty, one of the best and most rewarding jobs in the Army. They're doing a *tremendous* job.

Every single day of his tour, the drill sergeant develops soldiers. And oh-by-the-way, he's also developing his own leadership and people skills. We're turning back to the field a better sergeant than when he first walked into drill sergeant school.

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

A Be proud of what of you do. Don't get hung up on the negatives. We signed up to train hard, deploy on short notice and do America's "heavy lifting" all over the world, and the fact is, we're *doing* it. You're part of a tremendously competent force, and the Field Artillery is out in front.

Lieutenant General William J. Bolt is the Deputy Commanding General for Initial Entry Training of the Training and Doctrine Command at Fort Monroe, Virginia. In his previous two assignments, he commanded Fort Jackson, South Carolina, and served as the Director of Force Programs in the Office of the Deputy Chief of Staff for Operations and Plans on the Army Staff at the Pentagon. He also served as Assistant Division Commander of the 6th Infantry Division (Light) at Fort Richardson, Alaska, and Chief of Staff of the 101st Airborne Division (Air Assault), Fort Campbell, Kentucky. Lieutenant General Bolt commanded the 193d Infantry Brigade (Light) at Fort Clayton in Panama, and the 2d Battalion, 327th Infantry, also in the 101st Airborne Division. He is a veteran of two combat tours in Vietnam and Operations Desert Shield and Storm.

So...You Want to be a

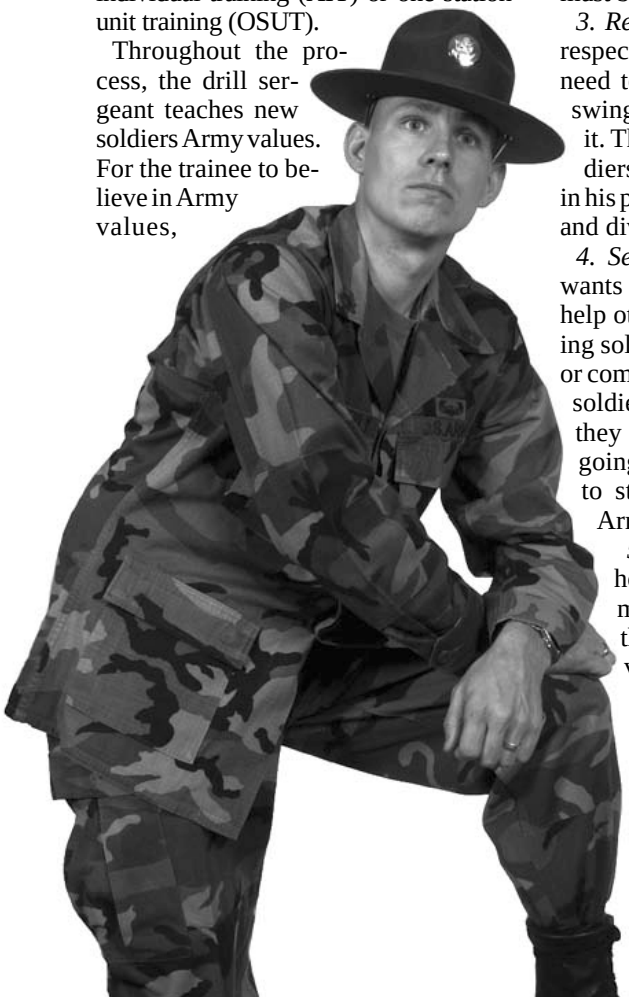
by Sergeant First Class Thomas M. Easterly

The drill sergeant wakes up at 0330 in the morning ready to train. He pulls a lot of duties and works about 16-plus hours a day and still feels like there's more he needs to do. And he'll work this way for "104" weeks a year. But, at the same time, he'll turn hundreds of civilians into US Army soldiers—defenders of our great nation.

The drill sergeant cares for soldiers and sees them as his credentials and the foundation of his reputation. He always trains and sets the example for his soldiers to follow, regardless of whether he's on the rifle bayonet course or the field for drill and ceremonies. His uniform is crisp, boots are highly shined and haircut is above standard. New soldiers must know no other but the right way to do things—do them to standard.

The drill sergeant is understanding and available. He knows that soldiers need someone they can talk too if an emergency arises. He always remembers what it was like when he went to basic combat training (BCT) and advanced individual training (AIT) or one-station unit training (OSUT).

Throughout the process, the drill sergeant teaches new soldiers Army values. For the trainee to believe in Army values, his drill sergeant must live, teach and enforce them. The trainee should want to emulate his drill sergeant, the Army's standard bearer for the trainee's first few months in service.



So….do you think you can handle it? If so, here are the Army's seven core values and how you, as a drill sergeant, live them for your trainees plus some tips to make your tour more successful.

Core Army Values. The Army's seven core values are basic to good leadership and, as a memory aid, spell out LDRSHIP: Loyalty, Duty, Respect, Selfless Service, Honor, Integrity and Personal Courage.

1. Loyalty. This means loyalty to the nation and the US Army as well as to trainees. Our new soldiers deserve an attitude of commitment to the Army and mission success and the drill sergeant models that attitude.

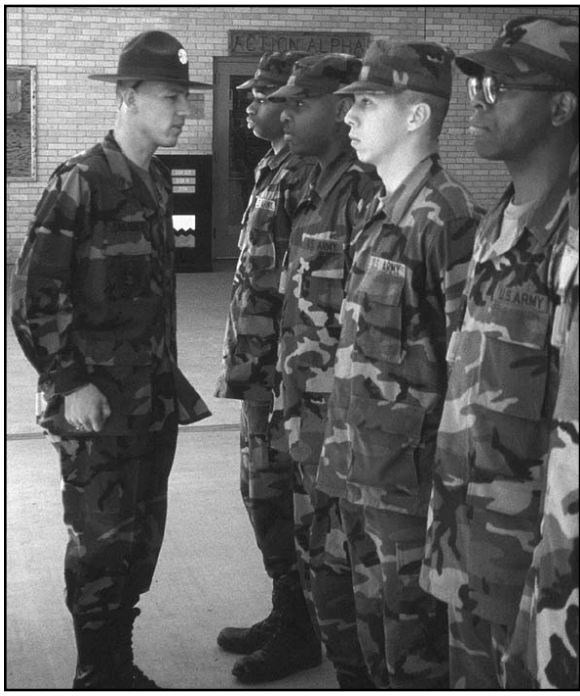
2. Duty. Drill sergeant duty calls for an NCO who is a self-starter and initiator. He must want the job, which is a way of life, for at least 24 months. Drill sergeants must be "high-speed/low-drag" NCOs.

3. Respect. The drill sergeant shows respect for others—all others. Soldiers need to see that respect is a two-way swinging door—you give and receive it. The drill sergeant teaches new soldiers how to earn the respect of others in his platoon and to respect their talents and diversity.

4. Selfless Service. A drill sergeant wants to give his time and energy to help others succeed. That means training soldiers when he's tired or stressed or coming in early on his day off to help soldiers with common task training so they can pass their tests. It means going that extra mile to train soldiers to standard and for success in the Army.

5. Honor. The drill sergeant has honor. He models nobility of the mind and is a credit to his unit and the Army. He lives the seven Army values.

6. Integrity. The drill sergeant's word is his bond. His words are consistent with his actions. He can be trusted with responsibility and authority, including over soldiers and missions.



FATC, Fort Sill, OK

The drill sergeant shows respect for others-all others.

7. Personal Courage. The drill sergeant never takes a "set back" as an "end of mission." He drives on to accomplish the mission. He has the courage to tell his superiors and others the absolute truth, pulling no punches, and in a timely manner.

He possesses the "eye of the tiger." At 0330, he is ready, motivated, aggressive, hard-charging and, above all, fair. Soldiers follow those who have the eye of the tiger.

There's no way a drill sergeant can "fake" honor or integrity or personal courage—any of the seven values. Soldiers know when someone is trying to "pull the wool over their eyes." You must truly live these values as well as teach them…or you *can't* handle the job of drill sergeant.

Tips for Drill Sergeants. If you're still interested in becoming a drill sergeant, then here are a few tips.

• Pay attention to details. Leave no task undone, no step out—shoes online, corners at the proper angle. Paying attention to the details will make our Army victorious on the battlefield.

• Perform above the standards. Meeting the standard is fine for the good soldier, but the drill sergeant sets the

Drill Sergeant?

example with higher standards and goals. This means you are dependable and accountable for a multitude of missions and at all times.

• Know when to take a stress break. The drill sergeant's job is stressful. At times, you may feel overwhelmed with tasks and responsibility, but you must take the attitude that (and experience proves) you will survive. You need to manage stress—to know *when* to take a few minutes to get away and relax.

• Get the support of your family. Family support is of the utmost importance to a drill sergeant. If your family does not fully support this tour, you may need to rethink your decision. Realistically itemize the responsibilities and time commitment that comes with accepting the position and be sure your family understands and supports your becoming a drill sergeant.

• Be able to make timely and accurate decisions. Being fast on your feet and knowing the schedule are key to being a successful drill sergeant. The ability to adapt to a changing situation and remedy shortcomings will make your job easier and more rewarding.

• Understand the big picture. The soldiers you train soon will be stationed in units around the world in all kinds of environments and circumstances. You must train them to understand that and succeed as part of that big picture.

What It Takes. So, you want to be a drill sergeant? Then you must meet stringent qualifications.

To be chosen for drill sergeant, you must either be Department of the Army (DA) selected or volunteer for this special duty. DA automatically screens records in its selection process while volunteers must initiate the DA screening process. DA will look at your evaluation reports, job performance, violations of the Uniform Code of Military Justice (UCMJ), complexity and responsibility of past assignments and the mental evaluation conducted at your home station and submitted to DA; DA also will conduct a background security check. A sergeant (E-5) must have a letter of recommendation from his battalion commander.

Next is Drill Sergeant School which is nine weeks and two days of intense training. As a drill sergeant candidate, you are taught all about Army values and traditions, human relations, different methods of instruction, the "soldierization" process and stress management. You also will study a number of field manuals (FMs) and Training and Doctrine Command (TRADOC) regulations, common task testing and many other subjects plus attend Master Fitness training. All drill sergeant school candidates must present several training modules, including drill and ceremony, rifle-bayonet and physical fitness. You must receive a "Go" on all training modules and pass all tests.

So…why go to all that trouble to qualify to work that hard on the job? It's true, the drill sergeant's job is not for everyone. But how many get a chance to be part of the soldierization process—change someone's outlook on life?

It's a proud moment in your life every time trained soldiers walk across a graduation stage and carry with them good honest values, confidence in their abilities and commitment to the Army and our nation. And then the next week, the battery fills with new trainees.

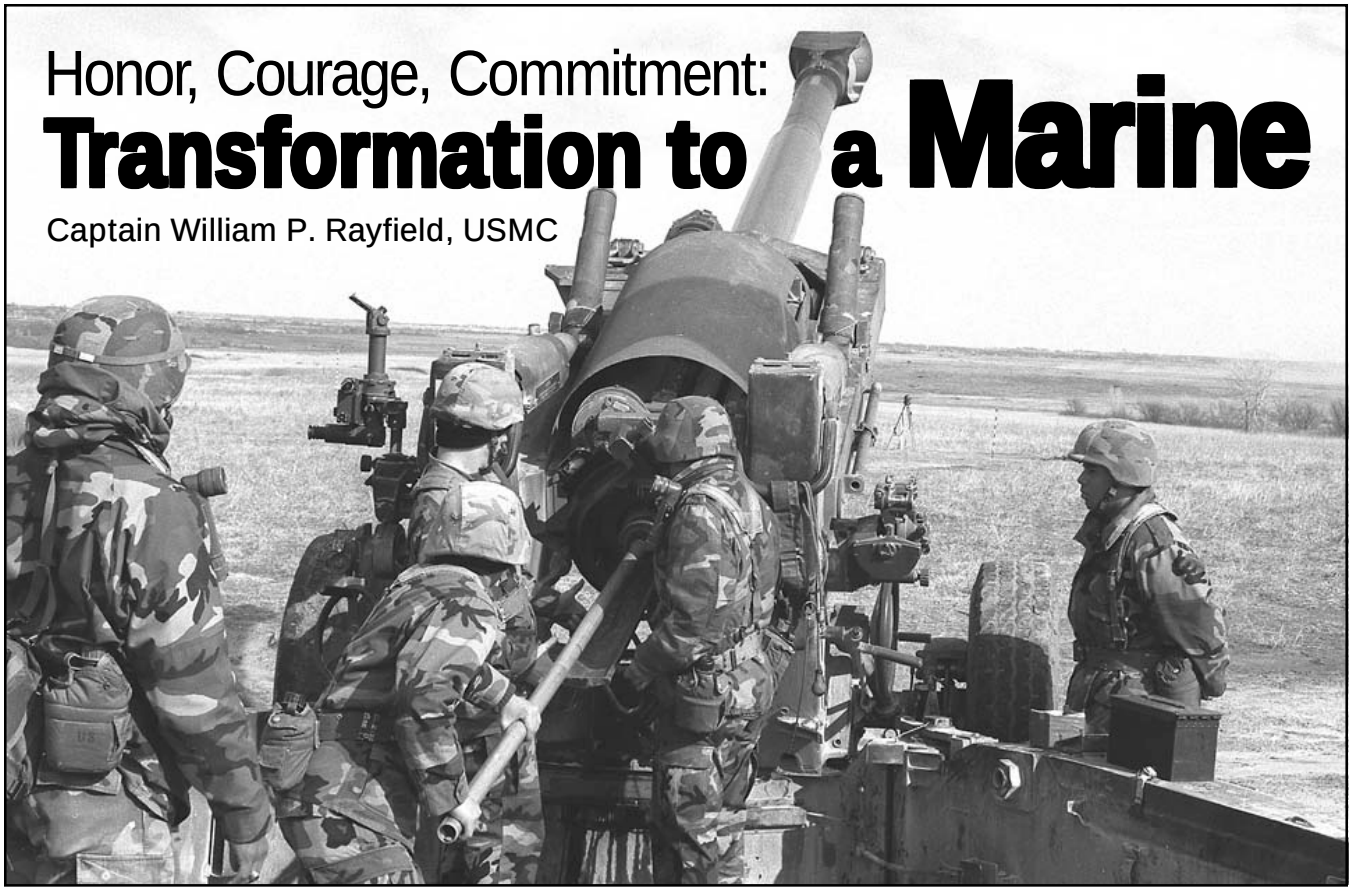
FATC, Fort Sill, OK

The drill sergeant goes the extra mile to train soldiers to standard and for success in the Army.

Sergeant First Class Thomas M. Easterly is the 1998 Drill Sergeant of the Year for the Field Artillery Training Center (FATC), Fort Sill, Oklahoma. He's the Senior Drill Sergeant for the Cadre Training Course at the FATC. He also has served as Platoon Drill Sergeant in both D Battery, 2d Battalion, 80th Field Artillery (D/2-80 FA), and B/2-80 FA, also in the FATC. Among other assignments, he deployed to Haiti as a Security Team Chief in B/1-7 FA for UN Operations Restore and Uphold Democracy, part of the 10th Mountain Division (Light Infantry) Artillery. He was the Honor Graduate in his class at the Drill Sergeant School, Fort Jackson, South Carolina, earning the Leadership Award, High Physical Training Award and the Post Commanding General and Command Sergeant Major Leadership and Excellence Award. He was inducted into the Audie Murphy Club during his tour with the 10th Mountain Division and designated Master Warfighter in his Advanced NCO Course (ANCOC). He holds an Associate's Degree in Science from Jefferson Community College, New York.

Honor, Courage, Commitment: Transformation to a Marine

Captain William P. Rayfield, USMC



Two hundred and twenty-three years ago, the United States Marine Corps was formed based on the values of honor, courage and commitment. Since that time, Marine virtues have been extolled through actions and deeds around the world—not only by those in uniform on hostile shores, but also by other Americans who, at one point in their lives, were transformed into Marines. The Marine ethos has survived relatively unchanged in the face of our rapidly ever-changing society. What training does one undergo in the Marine Corps that changes one forever?

The initiation of this transformation as well as a critical part of the process is the Marine Corps initial entry training (IET) program: recruit training called "Boot Camp," Marine Combat Training (MCT) and then Military Occupational Specialty (MOS) school. This article discusses the three parts of the Marine Corps IET pipeline and how they help inculcate the values that make a Marine a Marine—and make him one for life.

Boot Camp. Boot Camp at Parris Island, South Carolina, or San Diego, California, is 12 weeks of intense training in which young recruits learn what it takes to be a Marine. This first step in the transformation process is the most critical and difficult.

Drill instructors work feverishly to break any individualistic, selfish attitudes a new recruit has and instill Marine Corps pride and an unwavering sense of integrity and professionalism. Recruits are pushed to their limits and beyond. Teamwork and esprit become the measuring stick of progress integral to daily life.

Most recruits make it through Boot Camp; several do not. Those who graduate have been immersed in the Marine ethos and have chosen to make Marine Corps values their own. How is this accomplished?

The initial step of the transformation is the stripping away of detrimental cultural stigmas and attitudes, a process that begins the moment the recruits enter the gates of the recruit depot. All male recruits' heads are shaved to create commonality and deny any individual identification. This single event firmly and immediately places all recruits on a common ground from which team-oriented Marines are formed.

In Boot Camp, physical challenges are presented through conditioning marches, fitness tests and combat water survival skills. Nearly 70 hours are assigned for this type of demanding character building. Fifty-four hours of close order drill build teamwork and unity of effort among the recruits. The platoon becomes the team unified to win the coveted drill competition. More than 41 hours of study are set aside for core values training: inculcating the values of honor, courage and commitment—never failing one another. In addition, two full weeks of Boot Camp are devoted to marksmanship training.

Drill instructors function as role models who consistently set the example, expecting all recruits to conform to the same high standards of personal conduct, accountability and respect for others. The focus is on what is required of them as Marines, not just defenders of their country.

History, tradition and esprit de corps are repeatedly emphasized. Three classes are set aside for indoctrination into Marine history; drill instructors miss no opportunity to remind new recruits of actions of past Marines. The drill instructors emphasize that recruits may face the same difficult decisions during their service as the Marines who have gone before. The Marine legacy motivates the current Corps, thereby sustaining Marine values.

Boot Camp culminates with "The Crucible." This three-day, 54-hour exercise in the 11th week of training tests the recruits' physical limits and reaffirms their commitment to teamwork. The crucible begins with an 0300 movement that includes sleep deprivation, roughly 40 miles of marching and tactical problem solving, creating the stress and uncertainty the soon-to-be Marines could face in combat.

"Warrior stations" named for Marine heroes who demonstrated the Corps values serve as obstacles each team of recruits must negotiate. The emphasis is on innovation, initiative and teamwork to accomplish the mission.

One station is Timmerman's Tank. At this station, five recruits grab ropes attached to two, 10-foot planks and keep their feet flat on the planks—similar to a pair of multiple-person skis. Then the five must negotiate a winding route on their plank "skis" while moving as a team—sort of like cross-country skiing. In successfully completing this obstacle, Marines learn that alone, each can accomplish limited objectives, and as a cohesive team, they can overcome any number of obstacles.

The end of The Crucible comes as they march back to their base area and are called "recruits" for the last time. Each Marine receives the eagle, globe and anchor device, a symbol worn on the Marine uniform that represents valor, strength, global service and naval heritage. This is the proudest moment in their young lives—they are now Marines and indoctrinated into the brotherhood.

Marine Combat Training. MCT is a three-week combat skills training course at Camp Lejeune, North Carolina, or Camp Pendleton, California. Here the new Marines learn the basics of infantry skills needed to win on the modern battlefield—regardless of their future MOS. The premise of the Marine Corps is that "every Marine is a rifleman."

MCT stresses squad tactics and coordination. The Marines negotiate fire and maneuver courses and learn to operate various weapon systems, such as the M2 .50 caliber machine gun, MK19 grenade launcher and M249 squad automatic weapon. Marines throw grenades and learn small unit tactics of offense, defense and patrolling.

Although the basic combat skills are the primary focus at MCT, Marines also are reminded of their basic responsibilities and commitment to serve in "every clime and place." During MCT, Marines must continuously demonstrate they look out for one another, uphold the ideals of the Marine way of life and contribute to the team.

As these values are reinforced, the transformation from civilian to Marine mindset continues, further distancing the Marine from the former selfish mantra of life before the Corps. With this transformation comes more responsibilities and accountability.

MOS School. Next the Marines attend their MOS schools—for Marine Field Artillerymen, Fort Sill, Oklahoma. At Fort Sill, they train in their artillery MOS in courses ranging from four weeks to two months: cannoneer, fire direction controlman, scout observer, meteorological crewman, meteorological repairer, radar operator, surveyor and radar repair specialist. Each year, approximately 1,200 new Marines train at Fort Sill for assignment to Marine artillery units around the world.

Each year, approximately 1,200 new Marines train at Fort Sill for assignment to Marine artillery units around the world.

Underlying this focus on professional skills is the continued emphasis on basic Marine values. At the Fort Sill MOS school, each battery formation begins and ends with Marines reciting the cornerstone values: honor, courage and commitment. All personnel in the battery structure contribute to the continuation of values training by action, example and instruction in the classroom.

The Marine Corps recently instituted the Marines Awaiting Training (MAT) program. The program sustains the transformation process, enhances the foundation initiated during recruit training and gives the Marines a head start on MOS skill training during a time lag between MCT and the beginning of their MOS school. The MAT program ensures Marines stay motivated after MCT and eager to continue their formal education in the art of warfare.

MAT is small group instruction by the battery staff, thereby allowing for individual involvement and discussions on topics ranging from ethical leadership, professional behavior, financial management and hazing prevention to rules of engagement (ROE) and combat emergency first aid. Battery staff NCOs with MOS instructor experience lay the groundwork for MOS training with common artillery knowledge.

The final stage of the initial transformation process occurs at the Marine's first duty stations with units around the world. Fleet Marine Force units continue to instill and perpetuate the values of the Corps and establish an environment that rewards hard work, integrity and personal responsibility. The young Marines see that the ideals indoctrinated at Boot Camp and sustained at each succeeding step of IET are lived by real-world Marines—that every Marine is part of an entity that's far greater than the individual.

IET is not a one-stop shop for Marine values, but rather the initiation of a lifetime journey into the brotherhood—whether as a Marine in uniform or as a better citizen for America.

Captain William P. Rayfield, US Marine Corps, commands the Marine Corps Battery at Fort Sill, Oklahoma. In his previous assignment, he was the Officer-in-Charge of the Marine Corps Cannon Crewman Course and, earlier, an FA Officer Basic Course Instructor as part of the Gunnery Department of the FA School, both assignments at Fort Sill. He served as a Battery Executive Officer, Fire Direction Officer, FA Liaison Officer and Forward Observer in A Battery, 1st Battalion, 10th Marines at Camp Lejeune, North Carolina. While with the 10th Marines, he deployed to the Republic of Haiti in support of Operations Uphold and Restore Democracy and with the 22d Marine Expeditionary Unit (Special Operations Capable) in support of Operation Noble Obelisk in Freetown, Sierra Leone.

Redleg Mentor Program:

Sharpening the Sword, Nurturing the Spirit

by Lieutenant Colonel Britt E. Bray and
Major William M. Raymond, Jr.

Napoleon Bonaparte once stated, "There are only two powers in the world…the sword and the spirit. In the long run, the sword is always defeated by the spirit."[1] For newly commissioned lieutenants, the Field Artillery School, Fort Sill, Oklahoma, has long done its best to help sharpen the sword through training. Then in 1996, the school instituted the Redleg Mentor Program in the Officer Basic Course (OBC) to nurture the spirit of the new young officers, our leaders for the 21st century.

This article briefly examines the mentoring concept and describes the Redleg Mentor Program for new second lieutenants in the Field Artillery. Although the focus is on a program for OBC, it's important to remember that the mentoring process occurs in many units and other schools for soldiers of all ranks and in the civilian sector.

Mentoring Defined. Mentoring is "any relationship in which a senior, experienced superior takes a personal interest in junior, more inexperienced subordinates and undertakes to provide them with assistance, guidance, or protection."[2] Simply put, mentoring is caring leadership.

An excellent 1985 *Military Review* article, "Leaders as Mentors," discusses the various functions that mentors perform: "Clarify career goals and help develop a long-term strategy for career planning and advancement. Aid in the development of short-term individual development plans. Share knowledge and provide instruction in technical as well as leadership and management skills. Serve as a role model and include the protégé in activities which will allow him or her to develop the frame of reference, values and skills required at higher organizational levels. Provide counseling on job-related or personal problems. Provide visibility for the protégé and intervene to ensure that the protégé receives the assignments and experience required for advancement."[3]

A common philosophy in today's Army is that mentors should be at least two ranks higher than the individual being mentored. Research also tends to show that most mentors are usually eight to 15 years older than those they mentor. An age difference greater than 15 years may pose generational problems with the relationship more that of a parent-child. An age difference of less than eight years is more likely to result in a peer relationship, interfering with the mentorship functions.[4]

Redleg Mentor Program. In February 1996, the Redleg Mentor Program began with OBC Class 3-96. The program was started as one of several initiatives to help reduce the high student recycling and termination of commission rates in OBC without lowering standards. The program was designed to identify and solve lieutenants' academic problems earlier and help the young officers get started on the right track to a successful career in the Army.

Each OBC class is organized into platoons and howitzer sections to facilitate the program. The howitzer section of eight to 10 lieutenants has a senior mentor and two or three sponsors—captains or first lieutenants from the FA Captains Career Course (formerly known as the FA Officer Advanced Course, or OAC). The senior mentor normally assigns each career course sponsor three or four lieutenants to establish more personal sponsor relationships. The 30th Field Artillery Regiment OBC battery commander provides the mentors and sponsors periodic email updates on their students' academic performance.

The commander of 3d Battalion, 30th Field Artillery (3-30 FA) is responsible for managing the mentor program for the Assistant Commandant of the FA School. He solicits field grade officers from across Fort Sill (Training Command and III Corps Artillery) to volunteer as senior mentors. He then matches mentors with each of the howitzer sections for an incoming OBC class. The sponsors are assigned from the captains career course class that has the most overlap with the OBC class.

At an icebreaker session, the mentors and sponsors begin interacting with the students to establish goals and objectives for the course and clarify the captains career course sponsors' role, based on the mentors' expectations. Thereafter, they meet monthly with the 3-30 FA scheduling four, two-hour working lunches during each OBC to facilitate this process.

Discussions at these sessions cover a wide variety of subjects, including what a lieutenant can expect when he arrives at his first unit (jobs, additional duties, social functions, etc.), administrative tasks (officer and NCO efficiency reports and support forms, other reports, the counseling process, etc.), what a good fire support officer does, and the qualities that make a battalion excellent. During these discussions, field grade mentors share their perspectives and tell a "war story" or two to illustrate a point, often providing handouts for the lieutenants to start their own "smart books." Some mentors bring in guests with special expertise and perspectives, such as a serving platoon leader or platoon sergeant. Some bring in a command sergeant major to talk to the lieutenants about the NCO efficiency report (NCOER) and how to counsel NCOs.

Most field grade mentors find other opportunities to be with their lieutenants: attend the AC's formal reception with their sections, sit in on their classes, visit them in the field during their call-for-fire shoots or the end-of-course Redleg War, participate in their Army physical fitness test (APFT), host informal social activities or parties at their homes or participate with them in sports, to name a few.

Many mentors strive to share activities that allow the lieutenants to experience the culture of the Army. These vary from attending a change of command, training meeting, staff call, command maintenance, a live-fire field training exercise or a basic training graduation. The new lieutenants indicate on their OBC evaluations that they relish the opportunity to escape the classroom and gain insights on the real Army.

Success and Its Keys. Since 1996, the number of students considered for recycling or commission termination fell from an average of 15.3 percent per OBC class to an average of five percent. The actual termination rate has fallen from four percent to less than one percent. The Redleg Mentor Program, in conjunction with other initiatives, contributed to this success story.

While the original intent of the program was to improve academic performance, other benefits have become apparent.

- The program provides OBC students more opportunities to demonstrate initiative and leadership. The reorganization of the OBC class down to howitzer sections has increased the number of student leadership positions and decreased the ratio of leaders-to-led. Before the program, platoon leaders were the lowest level of student leaders and they were responsible only for passing information and accounting for attendance.

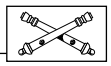
Now the student howitzer section leaders also are responsible for maintaining discipline, counseling, physical fitness training and tracking academics. They benefit from the watchful oversight of their sponsors and mentors and can tap them as experienced resources to help resolve section problems and assist in their leadership development.

- The program provides OBC students a more realistic set of expectations about their next assignments and the military in general. Lieutenants get an early start on learning about the Army and a glimpse of Army life.
- The program provides opportunities for captains career course students who soon will be battery commanders to develop and hone their skills at coaching and leading lieutenants under the guidance of an experienced field grade officer.

There are several keys to the success of the program, but by far, the most significant is the senior mentor's commitment—the time and energy he's willing to give to the new officers.

Command emphasis and support as well as a formal feedback mechanism are two other reasons for the success of the Redleg Mentor Program. The Assistant Commandant personally briefs each incoming group of field grade mentors at the officers club, just prior to each mentor meeting his OBC howitzer section and captains career course sponsors for the first time. Each graduating OBC class completes a course evaluation that includes a request for their comments on the Redleg Mentor Program. Overall, the program has averaged a 4.02 rating on a scale of 5, with five being "Excellent."

Mentoring is more art than science. The FA School's program of technical and professional instruction is giving OBC students the sword they need in their profession of arms. Its Redleg Mentor Program is giving our most junior officer leaders the nurturing foundation to develop their careers in the Field Artillery and Army. It's up to unit leaders in the field to continue this critical process and ensure the development of the future officer corps of our branch.



Lieutenant Colonel Britt E. Bray commands the 3d Battalion, 30th Field Artillery in the Training Command at Fort Sill, Oklahoma. His previous assignments include serving as the Division Artillery Executive Officer and Deputy Fire Support Coordinator in the 24th Infantry Division (Mechanized) and, later, renamed the 3d Infantry Division (Mechanized), at Fort Stewart, Georgia. He also served as the S3 for the 2d Battalion, 8th Field Artillery, 25th Infantry Division (Light), based at Fort Lewis, Washington, and commanded Service Battery for the 6th Battalion, 1st Field Artillery in the 1st Armored Division Artillery in Germany. He holds a Master of Business Administration from Oklahoma City University.

Major William M. Raymond, Jr., is a Combat Development/Experimentation Staff Officer in Task Force 2000, part of the Office of the Deputy Assistant Commandant for Futures in the Field Artillery School, Fort Sill. He recently served as the S3 and Executive Officer for 2d Battalion, 2d Field Artillery, 30th Field Artillery Regiment, Fort Sill. His previous assignments include serving as Assistant Professor in the Department of Social Sciences at the US Military Academy at West Point and S1, Assistant S3, and Commander of Headquarters and Headquarters Battery for 6th Battalion, 1st Field Artillery in the 1st Armored Division Artillery, Germany. A graduate of the Command and General Staff College, Fort Leavenworth, Kansas, he also holds a Master of Arts and Ph.D. in Politics from the University of Michigan.

Notes:

1. Fletcher M. Lamkin, "Academic Limits: The Teachings of PL3000, Military Leadership," *Assembly* (September/October 1998) 192.
2. Robert W. Riscassi, "Implementation of Mentoring Strategy in TRADOC Service Schools," Memorandum of US Army Combined Arms Center and Fort Leavenworth, Kansas, 14 July 1985, 1.
3. Charles W. Bagnal, Earl C. Pence and Thomas N. Merriwether, "Leaders as Mentors," *Military Review* (July 1985), 7.
4. Ibid.

3x6 Operations in the Paladin Battery

by Lieutenant Colonel Stephen D. Mitchell and Captain Patrick D. Quinn III

During the last two years, *Steel Dragons*, the 2d Battalion, 82d Field Artillery of the 1st Cavalry Division at Fort Hood, Texas, developed and tested tactics, techniques and procedures (TTP) to fight a Paladin battery under a 3x6 modified table of organization and equipment (MTOE). This article discusses our revised organization that has resulted in improved survivability, situational awareness, ammunition management and overall logistical support to the guns. Our motivation was to exploit the capabilities of Paladin focused on our contingency mission to deploy to and fight in the desert. The goal was to have situationally aware, semi-autonomous Paladin crews operating under a command and control structure that positioned them in the right place at the right time with the correct ammunition to support our maneuver brigade.

The process began with workshops for the battery leadership and drew heavily on the expertise of Paladin new equipment training team (NETT) personnel and observer/controllers at the National Training Center (NTC), Fort Irwin, California. Next, we wrote a tactical standing operating procedure (TACSOP) and tested it in two iterations of the Crusader concept and evaluation program (CEP), during our revised Paladin section evaluations (Table VIII) and in the NTC train-up at Fort Hood. Finally, we took our lessons learned in the Mojave Desert at the NTC and Southwest Asia during Operation Intrinsic Action and solidified our TTP for battery operations with a 3x6 MTOE.

Battery Reorganization. The doctrine and organization discussed in *FM 6-50-60 TTP for M109A6 (Paladin) Operations* is more germane to 3x8 than 3x6 operations. Rather than fighting two platoons of three guns each, we chose to fight three, two-gun pairs per firing battery. This does not rule out other employment techniques based on mission, enemy, terrain, troops and time available (METT-T), but it became our clear preference.

The 3x8 MTOE for the two, three-gun firing platoons authorizes each platoon two lieutenants (a platoon leader and fire direction officer, or FDO) and two sergeants first class (a platoon sergeant and gunnery sergeant). We restructured our battery personnel and equipment into two platoons: headquarters and firing. (See Figure 1.) The headquarters platoon has a battery executive officer (XO), a battery operations officer and two reconnaissance sergeants, who replaced the two gunnery sergeants. The six-gun firing platoon has a platoon leader, an FDO and two Paladin sergeants, who replaced the two platoon sergeants. Tactical fire direction is executed for all six guns at one fire direction center (FDC) in the firing platoon, and a battery operations center (BOC) in the headquarters platoon focuses on information management for the battery. With the restructuring began an adjustment of some responsibilities.

Battery XO. One of the key changes is we now have a full-time battery XO. Aside from additional duty as battery maintenance officer, the XO's duties parallel that of a mechanized infantry company XO. He's responsible for coordinating and executing all battery logistical support; allocating and prioritizing maintenance assets; establishing and operating battery resupply points (BRPs), which are similar to a battalion rearm/refuel/resupply/survey point (R^3SP) operations; conducting M1074 palletized loading system (PLS) flat-rack exchanges with the combat trains and (or) sister batteries; serving as officer-in-charge (OIC) of the battery trains and coordinating the defense of the trains; and providing/coordinating for all classes of supplies.

His duties are planned and executed in conjunction with the battery first sergeant. However, he needed a platoon sergeant to coordinate the specifics and facilitate the mission. Depending on the personnel available, this position can be filled by any number of NCOs—motor sergeant; nuclear, biological and chemical (NBC) NCO; or communications NCO.

Platoon Leader. The firing platoon leader supervises the gun line, consisting of six Paladins, six FA ammunition supply vehicles (FAASVs) and the battery FDC. The platoon leader's duties are relatively unchanged, just magnified by the increase in systems in his platoon. He still plans and executes the movement of the firing platoon to the next Paladin zone (PZ), supervises troop leading procedures and oversees the FA technical rehearsals from the battery

1st Cavalry Paladins

FDC down to the Paladin section. While centrally located among the battery's three "goose egg" position areas for the three Paladin pairs, the platoon leader must be able to move quickly to any pair and influence an event or aspect of the battle, such as react to an enemy threat, troubleshoot a degraded howitzer or facilitate movement to the next PZ.

Paladin Sergeants. The firing platoon has two Paladin sergeants. In a tactical environment, the duties of these sergeants are the same as that of a platoon sergeant: supervise the firing element within his goose egg.

Although it would be ideal to have a sergeant first class with each pair of Paladins, we typically ensure the best pair in each battery occupies the center and most forward goose egg, which is supervised by the platoon leader. For example, the platoon leader would be responsible for the "White Pair" shown in Figure 2. The two Paladin sergeants each cover a flank goose egg.

This ensures the most experienced Paladin commanders are at the front of the battery for movements and occupations, facilitating the lieutenant's ability to focus on his overall responsibilities as a platoon leader. Depending on METT-T, the battery recon sergeants can help the platoon leader supervise the goose egg.

Reconnaissance Sergeants. The duties of the recon sergeants are widely varied from those of the M109A3 gunnery sergeants. No longer conducting reconnaissance, selection and occupation of a position (RSOP), the reconnaissance teams can increase the situational awareness of the Paladin battery dramatically. In addition to the standard recon duties associated with a gunnery sergeant, a reconnaissance sergeant confirms or adjusts the three goose eggs in the PZ, reconnoiters the area surrounding the PZ to find a covered or concealed location for the battery FDC, reconnoiters a location one terrain feature back for the battery trains to occupy and conducts communications checks with the battalion tactical operations center (TOC) and battery FDC.

A firing battery needs two recon sergeants to conduct 24-hour operations. Ideally, each battery fills these slots with sergeants first class. However, a shortage of 13B30s and 40s led 2-82 FA to fill the role of recon sergeant with E-5s. We placed very experienced and specifically trained sergeants in the old gunnery sergeant's position and used our limited number of staff sergeants as Paladin commanders (section chiefs) and our limited number of sergeants first class as Paladin sergeants. We accepted risk in the recon sergeant position vice the Paladin commander or Paladin sergeant positions.

FDO and Battery Operations Officer. These two junior lieutenants each must be proficient at his counterpart's job, but their primary duties are quite delineated.

The FDO in the firing platoon FDC is responsible for tactical fire direction and fire mission processing for the three

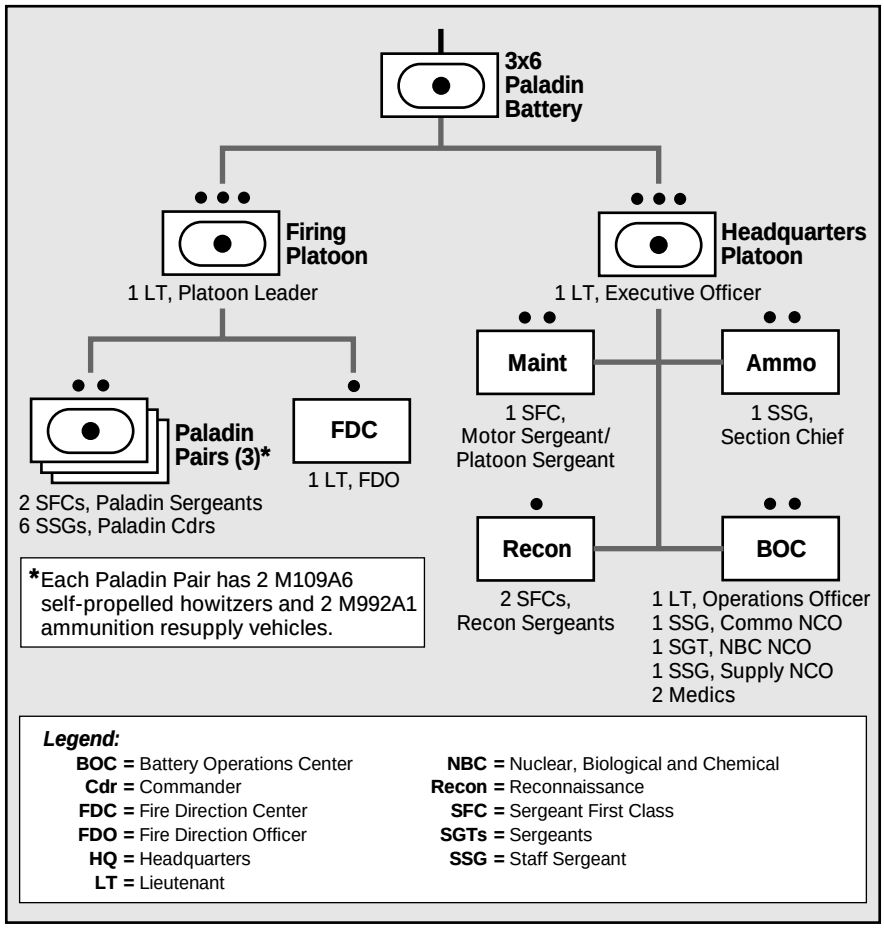


Figure 1: 3x6 Paladin Battery. The battery has two platoons: a firing platoon with three pairs of howitzers/resupply vehicles and a fire direction center (FDC) and a headquarters platoon with the battery operations center (BOC) and battery trains.

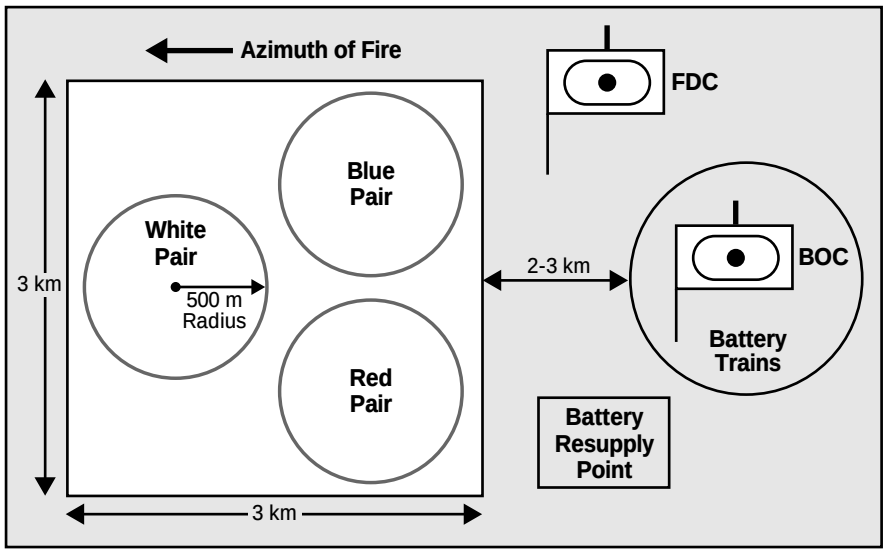


Figure 2: Tactical Employment of a 3x6 Paladin Battery

1. Maintain situational awareness of all aspects of the battle:
- Current Enemy Situation
- Current Maneuver Situation
- Battery Logistical Status (Fuel, Ammo, etc.)

2. Help coordinate and execute logistical support.
- Monitor logistical status of battery elements.
- Conduct flat-rack exchanges with battalion/sister batteries.
- Establish and run battery resupply points (BRPs).

3. Maintain backup firing capability.
- Conduct database verification concurrently with the fire direction center (FDC).
- Maintain communications with battalion FDC and Paladins.
- Track fire missions as they're being conducted.

Figure 3: Priorities of Effort for the Battery Operations Center (BOC)

pairs of Paladin. His duties are basically unchanged from those of a 3x8 platoon FDO, just magnified in providing tactical fire direction for six howitzers instead of three.

In the headquarters platoon BOC, the battery operations officer's duties are similar to those of a battalion assistant operations officer or a multiple-launch rocket system (MLRS) battery operations officer. This lieutenant is the OIC of the BOC and oversees the tracking of the battle, including the friendly and enemy situations; maintains the current status of all classes of supplies; helps the XO coordinate for logistical support; and maintains the fire direction database to provide backup in the event of the loss of the FDC. It's imperative the battery operations officer and NCO be proficient in all 13E-related duties as well as participate in FA technical and fire support rehearsals. Priorities of effort in the BOC are shown in Figure 3.

There are a number of options for employing the FDC and BOC. The commander can alternate hot and cold FDC/BOC from battle to battle, maintaining 24-hour operations for an extended period. He can echelon the FDC and BOC forward to the next PZ, significantly decreasing the battery's ready-to-fire time. Or he can keep the duties of each element focused, rotating personnel through each section periodically to maintain their military occupational specialty (MOS) skills.

The only change required to switch from BOC to FDC duties is to realign the communications net structure. The FDC monitors battalion fire direction nets (digital and voice), brigade fire (CF1) (voice), battery command (voice) and fire direction (digital). For BOC operations, the net structure consists of the FA battalion command/operations and intelligence (O&I) net (voice), FA battalion administration and logistics (A/L) net (voice), battalion fire direction (digital) as well as battery command (voice) and battery fire direction (digital).

Regardless of the employment option, the BOC-FDC organization has a number of advantages. The BOC can conduct prolonged 24-hour operations through crew rotation. The battery commander has a dedicated operations center to monitor and track the current situation updates from battalion and brigade. Finally, and probably most significantly, is the increased logistical awareness at the battery level.

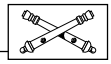
Tactical Employment. There are minor differences in the tactical employment and positioning of a Paladin battery conducting operations with one FDC as illustrated in Figure 2. Three 500-meter goose eggs are required, the size of the firing platoon's PZ is increased to a three-kilometer square area, and the battery trains occupies a position two to three kilometers behind the firing platoon or one terrain feature away. The implementation of a third goose egg disperses the Paladins and increases their survivability from indirect fire systems.

Instead of having three Paladins in one 500-meter radius, two Paladins per goose egg are more dispersed. They have a larger number of firing positions to occupy before exhausting that goose egg, which would require a move.

The battery FDC occupies a hide position just out of the PZ to eliminate the possibility of its receiving counterfire impacting in the goose eggs. Due to its limited defensive capabilities, the FDC needs to be away from likely avenues of attack and positioned to minimize its visual signature and reduce the electronic signature of its radios.

The BOC occupies in the battery trains area approximately two to three kilometers from the PZ—well within digital communications range to take control of the guns if the FDC is destroyed or incapacitated. The remainder of the battery elements occupy in the vicinity of the battery trains. This an area approximately one-kilometer square located two to three kilometers from the PZ and is configured in a 360-degree perimeter with the BOC in the center. Additionally the battery XO reconnoiters an area centrally located between the battery trains and the PZ to emplace a BRP. The BRP can be used to conduct any number of logistical resupply functions.

The way we restructured our Paladin battery for 3x6 operations is not the only way—just one that worked for us. Although the changes to the MTOE authorizations are relatively minor, they had a dramatic impact on battery command and control, situational awareness and logistical preparedness both in the garrison and field.



Lieutenant Colonel Stephen D. Mitchell commands the 2d Battalion, 82d Field Artillery, 1st Cavalry Division, Fort Hood, Texas. In previous assignments, he served as Wolf 03, Artillery Battalion Tactical Operations Trainer at the National Training Center, Fort Irwin, California; Executive Officer of the 1st Battalion, 3d Field Artillery and Deputy Fire Support Coordinator while assigned to the 2d Armored Division at Fort Hood. He also served as Assistant Fire Support Coordinator with the 3d Armored Division during Operation Desert Storm. He commanded two batteries, one in the 56th Field Artillery Command in Germany, and one in the 2d Armored Division.

Captain Patrick D. Quinn III until recently commanded C Battery, 2d Battalion, 82d Field Artillery of the 1st Cavalry Division. Currently, he is the FA Battalion Trainer for the 2d Battalion, 146th Field Artillery, Washington Army National Guard, in Olympia while assigned to the 81st Infantry Battalion (Training Support). In previous assignments, he served as Assistant Operations Officer for the 2-82 FA and Task Force Fire Support Officer (FSO), Assistant Brigade FSO, Platoon Leader, Fire Direction Officer and Company FSO all while assigned to the 1st Battalion, 41st Field Artillery, 24th Infantry Division (Mechanized), Fort Stewart, Georgia. Captain Quinn has fielded the M109A6 Paladin in two different divisions: the 24th under a 3x8 modified table of organization and equipment (MTOE) and the 1st Cavalry under a 3x6 MTOE.

Fire Support Planning for the Brigade and Below

by Major David A. Lee and Colonel John A. Yingling

The combat training centers (CTCs) have identified several problems that consistently plague fire support planning: fire support and targeting are poorly integrated into the military decision-making process (MDMP) and fire support officers (FSOs) are unsure of their role in staff planning.

First, a fire support plan that is not integrated with the maneuver plan results in unsuccessful fires in support of the operation. Integrating fire support requires the commander and his staff to think both maneuver *and* fires at each step of the MDMP and as *part* of that process—beginning at "Receipt of Mission" and continuing throughout the process. (See Figure 1.)

Input	MDMP Steps	Output
• Mission is received from higher headquarters or deduced by the commander/staff.	**Receipt of Mission**	• Commander's Initial Guidance* • WARNO 1
• Higher headquarters develops the WARNO, plan and IPB. • Staff analyzes the higher headquarters OPORD to develop facts and assumptions required for planning.	**Mission Analysis**	• Initial IPB Products • Restated Mission* • Commander's Intent* • Commander's Guidance* • WARNO 2 • Staff Products • Battlefield Framework • Preliminary Movement
• Staff uses the restated mission, commander's guidance, commander's intent, staff estimates and products, and enemy COA to develop the friendly COA.	**COA Development**	• COA Statements and Sketches
• Staff uses the enemy and friendly COA statements and sketches plus each staff sections' COA to wargame.	**COA Analysis (Wargame)**	• Wargaming Results • Task Organization • Mission to Subordinate Units • CCIR
• The staff uses criteria approved by the commander and the results of the wargaming to conduct COA comparison and develop the decision matrix.	**COA Comparison**	• Decision Matrix
• Commander approves the COA.	**COA Approval**	• Approved COA* • Refined Commander's Intent* • Specified Type of Order* • Specified Type of Rehearsal* • HPTL* • WARNO 3
• Staff produces and disseminates the orders.	**Orders Production**	OPLAN/OPORD*

*Responsibility of the Maneuver Commander

Legend:

CCIR = Commander's Critical Information Requirements
COA = Course of Action
HPTL = High-Payoff Target List
IPB = Intelligence Preparation of the Battlefield
MDMP = Military Decision-Making Process
OPLAN = Operations Plan
OPORD = Operations Order
WARNO = Warning Order

Figure 1: Military Decision-Making Process

Second, the potential benefits of the targeting process to focus and improve the MDMP are great. Targeting provides a mechanism to break out of the "stovepipe" battlefield operating system (BOS) view to better integrate combined arms planning. Unfortunately, too many commanders and staffs view targeting as a separate process or, at best, one that's parallel to the MDMP.

At the brigade and battalion levels, the targeting process requires no more people, equipment or time in planning than what the MDMP already requires. The MDMP and targeting need the same people: *the battle staff.* Targeting during MDMP merely requires each member of the battle staff provide more specific information and clearer focus at each step of the MDMP.

Most maneuver staffs don't realize they conduct targeting with every order they produce. For example, the decision to use an armored versus mechanized task force is the result of targeting. The "Concept of the Operation" (both maneuver and fires) developed by the battle staff must reflect the results of good targeting that's built into the MDMP.

The last CTC observation is that most task force and brigade FSOs don't understand how to integrate their actions and products in the MDMP steps as part of the battle staff. The current fire support manuals don't give enough details as to what the FSO does at each step. FSOs often don't understand the information and products needed as inputs of the steps. And they don't know the specific actions they must take to produce the outputs—which both support the MDMP and allow him to continue fire support planning.

To address these problems, the FA School, Fort Sill, Oklahoma, worked with the CTCs to develop tactics, techniques and procedures (TTP). The result is the white paper "Fire Support Planning for the Brigade and Below."

The purpose of the white paper is to outline a fire support planning process for the maneuver brigade and battalion that aligns with the MDMP outlined in *FM 101-5 Organization and Operations* and integrates the fire support components of the targeting process. The fire support plan produced using the process outlined in the white paper and, briefly, in this article will better integrate combined arms operations. This paper not only complements the MDMP steps outlined in FM 101-5, but also amplifies procedures for FSOs and others involved in fire support planning at brigade and below.

The Military Decision-Making Process. The MDMP is a single, established and proven analytical process. It is an adaptation of the Army's analytical approach to problem solving and a tool that assists the commander and staff develop a plan. (FM 101-5 details the steps of the MDMP in Chapter 5.)

What the FM does not describe in detail is the interrelationship of fire support planning and targeting with the MDMP. As a member of the brigade or battalion staff, the FSO serves as both the staff fire support expert and a member of the targeting team.

Key Definitions from the White Paper:

"Fire Support for the Brigade and Below"

Essential Fire Support Tasks (EFSTs)- A task for fire support to accomplish that is required to support a combined arms operation. Failure to achieve an EFST may require the commander to alter his tactical or operational plan. A fully developed EFST has a *task, purpose, method* and *effects.* The *task* describes what targeting objective (delay, disrupt, limit or destroy) fires must achieve on an enemy formation's function or capability. The *purpose* describes why the task contributes to maneuver. The *method* describes how the task will be accomplished by assigning responsibility to observers or units and delivery assets and providing amplifying information or restrictions. Typically the method is described by covering three categories: priority, allocation and restrictions. The *effects* quantify success for accomplishing the task.

Sample EFST

Phase IV: Be Prepared to Assault Obj Tiger.

Task: Disrupt MIC long-range AT and tank fires against assaulting forces on Obj Tiger and limit the CAR's ability to counterattack TF 1-3.

Purpose: To enable TF 1-3 to seize Obj Tiger.

Method: *Priority*—FA POF to TF 1-3. *Allocations*—FA fires AB2001 (SEAD) and AB2002 (ground-burst illum) to support CAS sorties. Bde will control 3xCAS (A-10s) to destroy enemy armor forces in CTB1. *Restrictions*—FASCAM firing requires Bde Cdr approval and cannot be delegated. Illum and Smk missions must be cleared by Bde prior to execution. NFAs (300-m radius) on COLTs, scout OPs, churches and hospitals throughout operation. Division and Bde CFL is PL Newt. O/O ACA Big Sky; no fires north of the 24 E/W grid line, east of Hwy 44 and south of Hwy 7.

Effects: MIC direct fires ineffective against assault forces on Obj Tiger. CAS destroys six tanks and three BMPs in CTB1.

Legend:

ACA = Airspace Coordination Area
AT = Antitank
Bde = Brigade
BMPs = Soviet-Made Tracked Infantry Combat Vehicles
CARs = Combined Arms Reserves
CAS = Close Air Support
Cdr = Commander
CFL = Coordinated Fire Line
COLTs = Combat Observation Lasing Teams
CTB = CAS Target Box
E/W = East/West
FASCAM = Family of Scatterable Mines
Illum = Illumination
MIC = Motorized Infantry Company
NFAs = No-Fire Areas
Obj = Objective
O/O = On Order
OPs = Observation Posts
PL = Phase Line
POF = Priority of Fires
SEAD = Suppression of Enemy Air Defenses
Smk = Smoke
TF = Task Force

Fire Support Planning Imperatives. Four imperatives provide the foundation for integrated fire support planning as outlined in the white paper.

1. Fire support planning must be part of the MDMP and mirror the steps of the existing planning process. FM 6-20 Doctrine for Fire Support, Page 3-3, states "it is essential that fire support planning is performed concurrently with the development of the scheme of maneuver." Fire Support planning is merely a component of the MDMP; the FSO must plan in concert with the combined arms battle staff. The terminology and focus of fire support planning must mirror the MDMP as much as possible. As a member of the battle staff, the FSO contributes at each step of the MDMP and gains the information and decisions he needs to formulate and (or) refine his fire support plan. Fire support planning requires the interaction of the battle staff and commander to be effective.

2. Fire support planning truly must integrate the functions of targeting: decide, detect, deliver and assess (D^3A). FM 6-20-10 TTP for the Targeting Process, Page 1-3, states " targeting is integral to the planning process" and FM 101-5 states "targeting is closely related to the MDMP," but they do not always clearly show where and how they're integrated.

While targeting isn't a function of fire support planning, per se, the FSO is a key player as part of the targeting team and his plan must reflect the results of targeting. The targeting process at brigade and below must be achieved within the MDMP without an additional set of steps. If targeting is successfully integrated into the MDMP, the resulting operational and fire support plans will answer the questions is Figure 2.

3. Fire support planning must support and be integrated with the reconnaissance and survey (R&S) plan. A key link between the MDMP, fire support planning and targeting is the R&S plan. It requires combined arms operational

Essential Field Artillery Tasks (EFATs)- A task for the Field Artillery that must be accomplished to achieve an EFST. A fully developed EFAT has a *task, purpose*, *method* and *effects*. The *task* describes the effects of fires against a specific enemy formation(s): suppress, neutralize, destroy, screen or obscure. (Note that firing family of scatterable minefields, or FASCAM, and suppression of enemy air defenses, or SEAD, are special cases.) The *purpose* is a summary of the task and purpose from the EFST. The *method* describes how the task will be accomplished by assigning responsibilities to the batteries, survey and FA battalion tactical operations center (TOC). Typically, the method is described by covering three categories: priority, allocation and restrictions. Priority provides the batteries with priority of fire (POF) and priority of survey. Allocation includes movement triggers, routes, position areas (PAs), azimuth of fire (AOF), targets (priority and final protective fires, or FPFs) and radar zones. Restrictions cover fire support coordinating measures (FSCMs) and survivability movement criteria. *Effects* is a quantification of the FA task and positioning of FA units.

Sample EFAT

Phase IV: Be prepared to assault Obj Tiger.

Task: Fire SEAD and ground-burst illum in support of CAS attack in CTB1.

Purpose: Disrupt MIC long-range AT and tank fires against assaulting forces on Obj Tiger and limit the CAR's ability to counterattack TF 1-3 to enable TF 1-3 to seize Obj Tiger.

Method: *Priority*—FA POF to TF 1-3. Priority for survey is A, C, B, Q-36 radar in order. *Allocations*—A Btry moves from PA 14 O/O along Route Purple to PA 15, AOF 1600. C Btry moves from PA 33 after A Btry is set in PA 15 along Route Brown to PA 34, AOF 0800. A Btry fires AB2001 (SEAD) and B Btry fires AB2002 (ground-burst illum) to support CAS sorties into CTB1. *Restrictions*—FASCAM firing requires Bde Cdr approval and cannot be delegated. Illum and Smk missions must be cleared by Bde prior to execution. NFAs (300-m radius) on COLTs, scout OPs, churches and hospitals throughout the operation. Division and Bde CFL is PL Newt. O/O ACA Big Sky; no fires north of 24 E/W grid line, east of Hwy 44 and south of Hwy 7.

Effects: ADA sites suppressed, enemy MIC position marked. A Btry in PA 15. B Btry in PA 24. C Btry in PA 34. Q-36 located in PA 63. FAT located in PA 71. CAT located in PA 83. TOC located at PA 93.

Legend:

ADA = Air Defense Artillery
AOF = Azimuth of Fire
CAT = Combat Artillery Trains
FAT = Field Artillery Trains
PA = Position Area
TOC = Tactical Operations Center

Concept of Fires- The logical sequence of EFSTs when integrated with the scheme of maneuver will accomplish the mission and achieve the commander's intent. In broad terms, the concept of fires allocates the fire support assets to achieve the EFSTs. The concept of fires is the basis of the fires paragraph of the operations order (OPORD).

Scheme of Fires- The detailed, logical sequence of targets and fire support events to find and attack the high-payoff targets (HPTs). The scheme of fires details how to execute the fire support plan to accomplish the commander's EFSTs in accordance with the allotted time and the space on the battlefield. To articulate the scheme of fires, the products of the OPORD's fire support annex are the fire support execution matrix (FSEM), target list/overlay and (or) a modified target synchronization matrix (TSM).

- ***Decide-*** What specific enemy formations and capabilities must we attack with fires and what objectives must we achieve with which specific fire support assets to support the commander's intent and the concept of the operation?
- ***Detect-*** How and where will we find these enemy formations, and where can we best attack them to achieve the required objectives?
- ***Deliver-*** How (with what assets) and when will we attack these enemy formations?
- ***Assess-*** What defines success or the objectives for each fire support task, and how will we assess them?

Figure 2: The targeting process (Decide-Detect-Deliver-Assess) at brigade and below is achieved in the military decision-making process and integrated into fire support planning without separate processes or steps. The result is an operational and fire support plan that answers the questions in this figure.

MDMP Steps	Input	Actions	Output
Receipt of Mission and Mission Analysis	Higher WARNO or OPORD Facts from FA Bn, ALO, Others Facts from Higher, Lower, and Adjacent FSEs and FISTs IPB Products Enemy COAs from S2 HVTs by Enemy Phase or Critical Event	Understand higher maneuver and fire support plan. Organize and analyze facts. Identify specified and implied tasks. Translate status of fire support assets into capabilities. Analyze effects of IPB on fire support. Use above to develop draft EFSTs.	FSO issues fire support WARNO 1 (or fire support information is included in the Bde WARNO). FSO portion of Mission Analysis brief is the higher fire support plan and briefing charts: • Fire Support Status • Fire Support Capabilities/Limitations • Fire Support IPB Analysis • Fire Support Timeline Recommend EFSTs. Commander approves or modifies EFSTs and gives other fire support guidance. FSO issues fire support WARNO 2 (or fire support information is included in the Bde WARNO).
COA Development	See Output from the Receipt of Mission and Mission Analysis step.	Determine where to find and attack EFST formations. Identify HPTs in those formations (TVA). Quantify the effects for EFSTs. Plan Methods for EFSTS: • Allocate assets to acquire. • Allocate assets to attack. • Integrate triggers with maneuver COA. Use battle calculus. Assist S2 in R&S development to support fire support.	For Each COA: • Concept of Fires • Draft FSEM • Draft Target List/Overlay • Draft TSM or Modified TSM • Collection/R&S Plan
COA Analysis and COA Comparison	See Output from the COA Development step.	Targeting Decisions: Finalize HPTL. Wargame fire support plan(s) vs enemy COAs. Modify/refine input as required. Refine and test fire support plan.	Final Drafts of Fires Paragraph and Fire Support Annexes: • FSEM • Target List • Target Overlay • TSM or Modified TSM (HPTL, AGM and TSS)
COA Approval and Orders Production **Staff Supervision**	See Output from the COA Analysis and COA Comparison step.	Approve briefing: • Fire support plan briefed as part of each COA. • FSO presents analysis as part of battle staff.	Commander selects, modifies or approves the COA. FSO issues fire support WARNO 3 (or fire support information is included in the Bde WARNO). Clean up, finalize and reproduce written products. Prepare, rehearse and issue OPORD as part of staff. Back brief fire support. Manage refinement. Rehearse.

Legend:

AGM = Attack Guidance Matrix
ALO = Air Liaison Officer
Bde = Brigade
Bn = Battalion
COA = Course of Action
EFSTs = Essential Fire Support Tasks
FISTs = Fire Support Teams
FSEs = Fire Support Elements
FSEM = Fire Support Execution Matrix
FSO = Fire Support Officer
HPTs = High-Payoff Targets
HPTL = High-Payoff Target List
HVTs = High-Value Targets
IPB = Intelligence Preparation of the Battlefield
MDMP = Military Decision-Making Process
OPORD = Operations Order
R&S = Reconnaissance and Surveillance
TSM = Target Synchronization Matrix
TSS = Target Selection Standards
TVA = Target Value Analysis
WARNO = Warning Order

Figure 3: Fire Support Planning Process

planning and links acquisition assets to find specific enemy formations for attack or to provide the information needed to answer the commander's critical information requirements (CCIR).

Fire support planning must support and be supported by the R&S plan. The R&S named areas of interest (NAIs) and target areas of interest (TAIs) must support the requirements of the fire support plan; fire support acquisition assets can be tasked to support the collection requirements. The R&S plan is the "observation" plan for the combined arms commander.

4. The result of fire support planning must be an effective, integrated and executable plan. The white paper describes a process for fire support planning at brigade and below. But it's the product of the process (the plan), not the process itself, that's important.

An *effective* plan clearly defines and focuses on achieving the effects required against the identified high-payoff targets (HPTs). An effective fire support plan uses all available acquisition and attack assets and pits the best combination against the right HPTs to support the commander's intent.

An *integrated* fire support plan provides focus and timing of acquisition and attack systems to achieve a unified effect on the HPTs. Integration means the plan is coordinated and combines with maneuver and other BOS to maximize the results of each attack and best achieve the objectives.

An *executable* fire support plan has the time, space and resources to achieve the objectives as planned. It ties detect and deliver assets to the HPTs and has a plan to assess the effects achieved. It must be simple, clearly communicated and flexible, using well-defined decision points and triggers.

Finally, maneuver commanders and fire supporters must understand the plan—to include the FA battalion, brigade and task force commanders and their staffs; mortar platoon leader; FSOs and fire support NCOs; forward observers and scouts; company commanders and their platoon leaders; the chemical platoon leader (mechanical smoke); intelligence/electronic warfare systems officer (IEWSO); and air liaison officers (ALOs).

Fire Support Planning as a Process. Like any process, fire support planning has inputs that are transformed by action and result in outputs. Figure 3 describes the sequence of inputs, actions and outputs of fire support planning for each step of the MDMP. This process helps FSOs better understand what they contribute to the battle staff and how to arrive at a plan. The process described in the white paper is a means to an end: an effective, integrated and executable fire support plan.

Other Areas in the White Paper. Other appendices included in the white paper are "Fire Support Planning in a Time-Constrained Environment," "Company/Team Fire Support Planning," "Fire Support Planning Terms," "Commander's Planning Guidance for Fire Support" and "The Fires Paragraph."

The 27-page "Fire Support Planning for Brigade and Below" white paper can be viewed in its entirety at the Center for Army Lessons Learned (CALL) web page at http://call-army.mil, "CALL Products, Special Products."

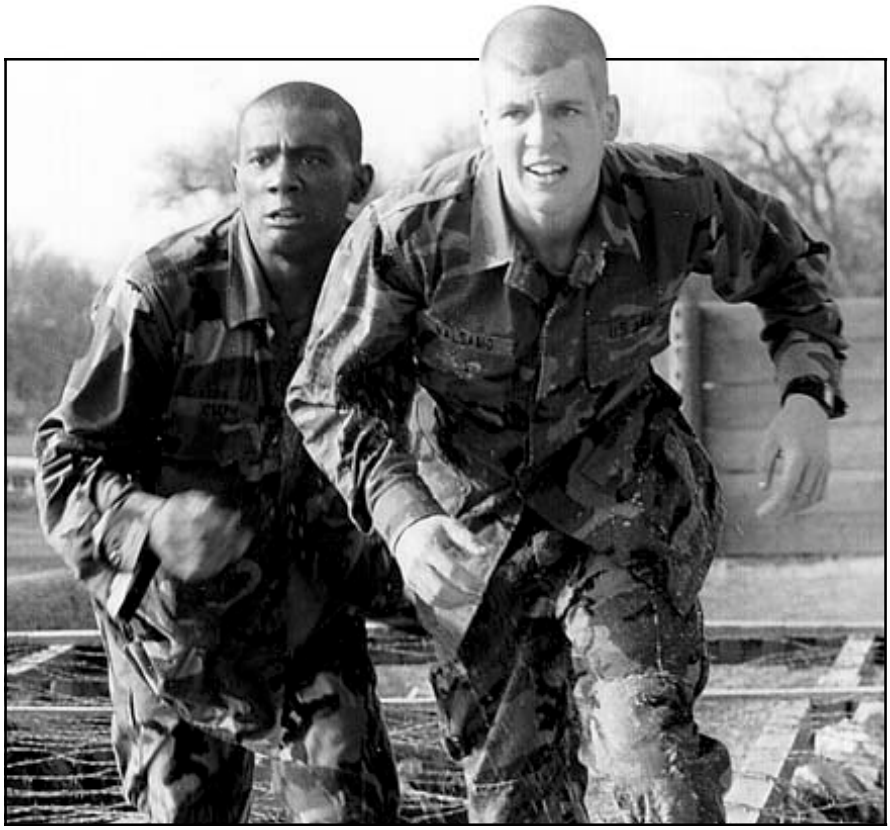
Fire supporters must tie the fire support planning process to the MDMP and help the battle staff realize the benefits of simultaneously applying the targeting methodology. The result will be more effective fires and an operation that achieves the commander's intent.

Major David A. Lee is Chief of the Advanced Fire Support Branch in the Fire Support and Combined Arms Operations Department (FSCAOD) at the Field Artillery School, Fort Sill, Oklahoma. Also in FSCAOD, he was a Small Group Instructor for the FA Officer Advanced Course. Among other assignments, he served as a Fire Support Officer (FSO) with the First Republic of Korea Army; Plans and Operations Officer with the 75th Field Artillery Brigade, III Corps Artillery, Fort Sill; and Commander of Headquarters and Headquarters Battery of the 5th Battalion, 18th Field Artillery, 75th Field Artillery Brigade. Major Lee was a Brigade Targeting Officer and Battalion S4 in the 7th Battalion, 15th Field Artillery, 7th Infantry Division (Light) at Fort Ord, California.

Colonel John A. Yingling is the Director of FSCAOD in the FA School. In his previous assignment, he commanded the 3d Infantry Division (Mechanized) Artillery at Fort Stewart, Georgia. He also commanded the 7th Battalion, 8th Field Artillery in the 25th Infantry Division (Light), Schofield Barracks, Hawaii. Among other assignments, he was the S3 of the 9th Infantry Division (Motorized) Artillery at Fort Lewis, Washington, and Battalion Executive Officer and Brigade FSO in the 1st Battalion, 11th Field Artillery, also in the 9th Infantry Division.

1-127 FA- First NG Unit to Field Paladin

The 1st Battalion, 127th Field Artillery (1-127 FA) with its headquarters in Ottawa, Kansas, is the first Army National Guard unit to be fielded the M109A6 Paladin. The battalion, with subordinate units in Kansas City, Topeka and Burlington as well as Ottawa, is one of two firing battalions in the 130th Field Artillery Brigade. The other, 2-130 FA, was recently fielded the multiple-launch rocket system (MLRS). With the completion of the two-year preparation for fielding and Paladin New Equipment Training (NET) in June 1998, 1-127 FA became a fully modernized general support 155-mm battalion.



FATC, Fort Sill, OK

Rites of Passage: Civilian to Soldier

by Lieutenant Colonel George W. Steuber

"You've done more with him in a couple of months of basic training than we've been able to do in 18 years"—comments like this are heard often at basic combat training (BCT) graduations. The parents are referring to the transformation that occurs when civilians become soldiers.

The transformation is not just physical, although that may be the most obvious change; it's usually more fundamental than that. The new soldier has developed the spirit, discipline and teamwork skills to be successful in any situation. His real transformation comes when he adopts Army values as the foundation of his character.

The US Field Artillery Training Center (FATC), Fort Sill, Oklahoma, recognizes this passage from civilian to soldier with both private and the more traditional public ceremonies. These "rites of passage" are designed to reward both the soldier and the family members and friends who have supported his choice to "Be All That He Can Be."

Soldier-to-Soldier Rites. One rite-of-passage ceremony takes place at the end of the grueling four-day Warrior field training exercise (FTX) the eighth week of basic training. The ceremony is conducted by soldiers for soldiers and recognizes the unique bond that exists among those individuals who have been tried, tested and found worthy of becoming part of the United States Army's tradition of excellence.

The Warrior FTX , itself, is a rite of passage. All the new soldiers' basic combat skills, physical endurance and mental toughness are put to the test in this exercise.

Each training battery develops and issues an operations order (OPORD) that drives the FTX and provides the context for the training. The FTX training support package contains a variety of events the battery can choose from in developing the events list. These are keyed to the actions of Medal of Honor recipients and highlight the Army values used to accomplish the mission. Drill sergeants and other FATC cadre brief the trainees' peer group leadership on the unit's FTX mission and supervise preparations for this culminating training exercise.

Warrior FTX starts with a minimum of a 10-kilometer tactical road march to the FTX site. Along the way, soldiers may encounter nuclear, biological and chemical (NBC) contaminated areas; ambushes; simulated indirect fire attacks; and any other challenges the ingenious opposing force (OPFOR) can use to test the new soldiers' mettle. Upon arriving at the FTX site, the soldiers quickly establish defensive positions to use as their base of operations for the next three days.

Twenty-four-hour operations force the soldiers to hone not only their individual skills, but also demonstrate the spirit, discipline and teamwork required to successfully accomplish a wide variety of collective tasks. They must conduct patrols and ambushes to collect information about the enemy and disrupt his attempts to collect information about their battery. They must defend their patrol base from ground attack, chemical attack and the effects of indirect fire. Even the required four hours in mission-oriented protective posture-level 4 (MOPP 4) gear goes by quickly as the soldiers' skills are tested and evaluated repeatedly.

The fourth and last day of the Warrior FTX dawns with the soldiers ready for their final challenge. After their last tactical road march of basic training—15 kilometers of reacting to OPFOR threats—lies the combat conditioning course (CCC). The CCC consists of 22 obstacles arrayed along a 600-meter course. The soldiers have negotiated the course once before during the third week of training, but that was when they were well rested. Now, after three days of a high level of activity, little sleep and a strenuous road march, fatigue adds a new dimension.

Everyone must complete the course; bragging rights go to the platoon with the fastest *collective* time through the course. Teamwork is essential to success.

At this point, the hours of physical training pay off. Upper body strength not there just a few short weeks ago comes into play as soldiers pull themselves and, as necessary, their comrades up ropes, under wire obstacles, over horizontal ladders and rope bridges. Lower body muscles that just minutes ago were propelling body, rucksacks and equipment down the road now zigzag through mazes, cross wire bridges and then vault over log obstacles. Cheers of encouragement and triumph erupt from the throats of the trainees as they complete this last challenge to their right to be numbered as trained soldiers.

As the last soldiers cross the finish line, the music starts. The cadre and the music call the new soldiers to the ceremony they have worked for since the start of basic training. The Warrior FTX's concluding ceremony recognizes the new soldiers' "coming of age" in the warrior profession. The soldiers are tired and dirty, but that does not concern them. They have met every training challenge thrown at them and have been successful.

The drill sergeants and cadre personally recognize this success one-on-one, highlight the Army values, heritage and traditions that contributed to the new soldiers' success, and welcome them as fellow warriors.

With military music and the scene of their latest triumph as the background, the drill sergeants select seven soldiers who have exhibited the Army values of loyalty, duty, respect, selfless service, honor, integrity and personal courage during the cycle. Each soldier's actions are recalled along with the Army value he exemplified. The battery commander then reviews the new soldiers' accomplishments as a team during each phase of the training and notes the brigade "streamers of excellence" awarded to the battery for their successes. The drill sergeants reinforce their commitment to Army values by congratulating each new soldier on completing the FTX and giving him Army Values dog tags. Tired, but elated at their successful completion of BCT, the soldiers march order their equipment and prepare for the short march to the barracks.

FATC, Fort Sill, OK

As part of their rites of passage, basic trainees receive their Army Values dog tags from their drill sergeants after completing the grueling Combat Confidence Course.

Public Recognition of the Transformation. FATC has had graduation activities and ceremonies for new soldiers for decades. Almost every Thursday, a basic training battery graduation is held at Sheridan Theater on Fort Sill. While every training battery adds the unit's personal touch to the ceremony, the basic elements and purpose remain the same: demonstrate the unit's professionalism, publicly recognize the new soldiers' accomplishments during training, reaffirm their commitment to the Army and thank the family members and friends attending the ceremony for their support.

The unit demonstrates professionalism by conducting each graduation ceremony with precision and attention to detail. Graduating soldiers are rehearsed on the smallest details of the ceremony.

The distinguished honor graduate receives memberships in both the Non-Commissioned Officer Association and the Association of the United States Army in addition to a certificate of achievement and letter of commendation. High scorers in basic rifle marksmanship and physical training, the most improved soldier and the most motivated soldier all receive certificates of achievement and letters of commendation; honor graduates receive letters of commendation. This official recognition not only recognizes the soldiers' accomplishments publicly, but also helps the soldiers accrue promotion points and tells the gaining units they're receiving top-quality soldiers.

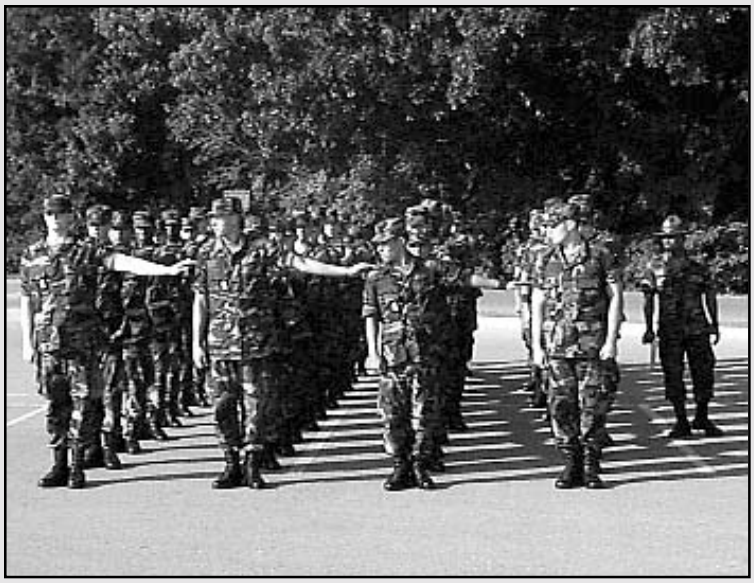
Unlike other training centers, the FATC recognizes every soldier graduating from BCT, not just those receiving special awards. As each soldier's name is called and he walks onto the stage to receive his diploma, parents, family and friends proudly crowd the aisles to take pictures of this event. This same scramble to record the moment is repeated when the soldiers reaffirm their oath of enlistment at the close of the ceremony.

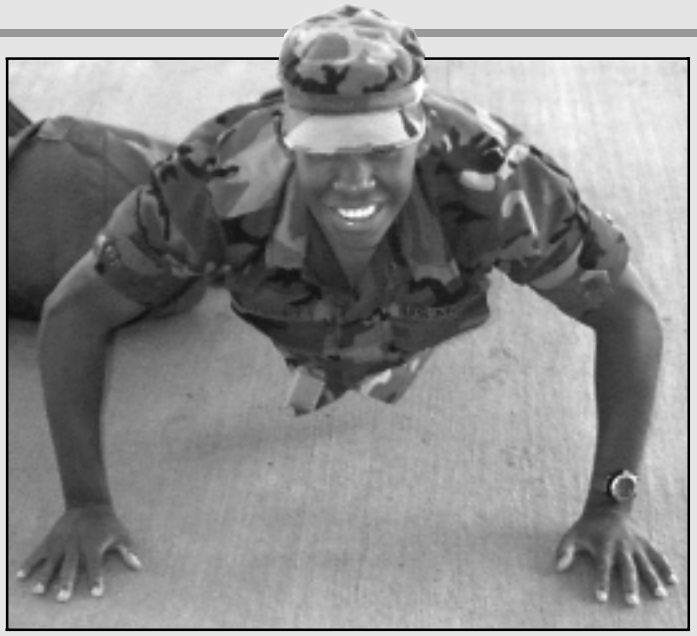
The soldier's family is an integral part of this recognition process. Family members and friends receive a letter from the battery commander outlining all the activities and opportunities on graduation day. These opportunities include Army Family Team Building classes for interested family members, family day demonstrations of weapons and training events and a dinner for all graduating soldiers and their guests. The dinners are invariably a success with proud new soldiers introducing family and friends to the person most responsible for making them a soldier, their drill sergeant.

The soldiers also get the chance to poke fun at the training experience through skits and impersonations drawn from sometimes imperfect memories of always perfect training events. All these precursors serve to highlight the real reason for getting together: to welcome the new soldiers who have pledged their lives in America's defense.

The rites of passage described in this article are an important part of the basic training transformation of the civilian to soldier. The soldier, tested by the rigors of the basic training and his Warrior FTX , has made it through the rites of passage to join the band of brothers dedicated to America's freedom.

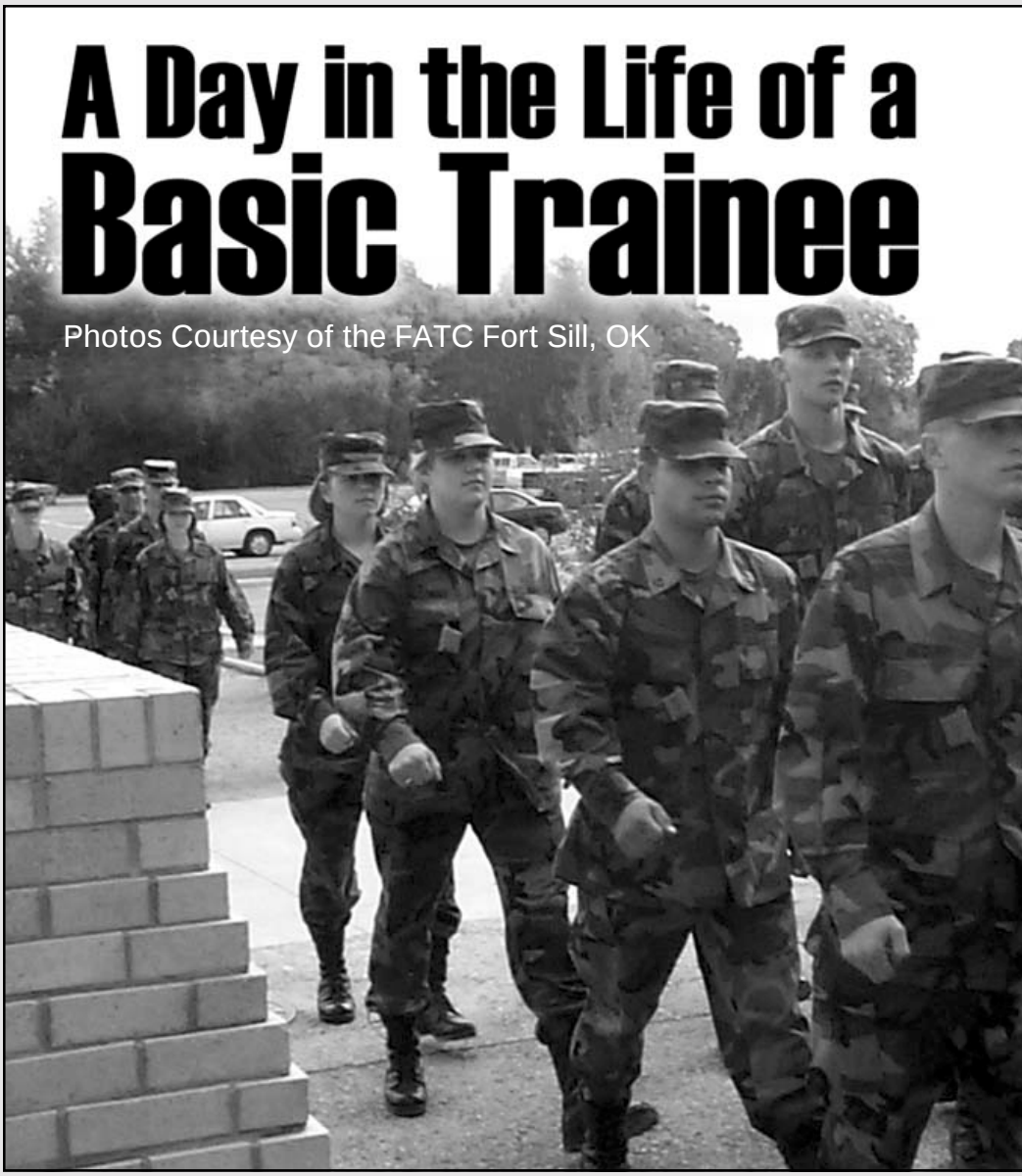
Lieutenant Colonel George W. Steuber commands the 1st Battalion, 19th Field Artillery (BCT/OSUT) in the Field Artillery Training Center (FATC) in the Training Command at Fort Sill, Oklahoma. In his previous assignment, he served as Division Artillery Executive Officer and a Brigade Fire Support Officer in the 10th Mountain Division (Light Infantry) at Fort Drum, New York. He also commanded E Battery, 1st Cannon Training Battalion at the FATC. Lieutenant Colonel Steuber has served as a Gunnery Instructor at the Field Artillery School, Fort Sill, and a Southeast Asia Foreign Area Officer, including as Chief of the Asia Branch, J2 on the Joint Staff at the Pentagon. He holds a Master of Arts in National Security Affairs from the Naval Postgraduate School at Monterey, California, and is a graduate of the Royal Thai Army Command and General Staff College at Bangkok.





A Day in the Life of a Basic Trainee

Photos Courtesy of the FATC Fort Sill, OK

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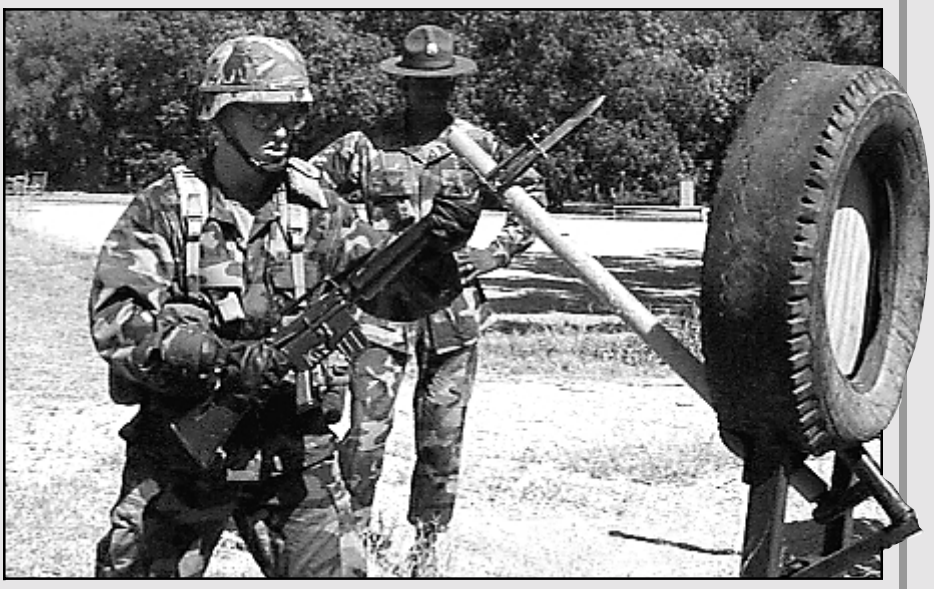
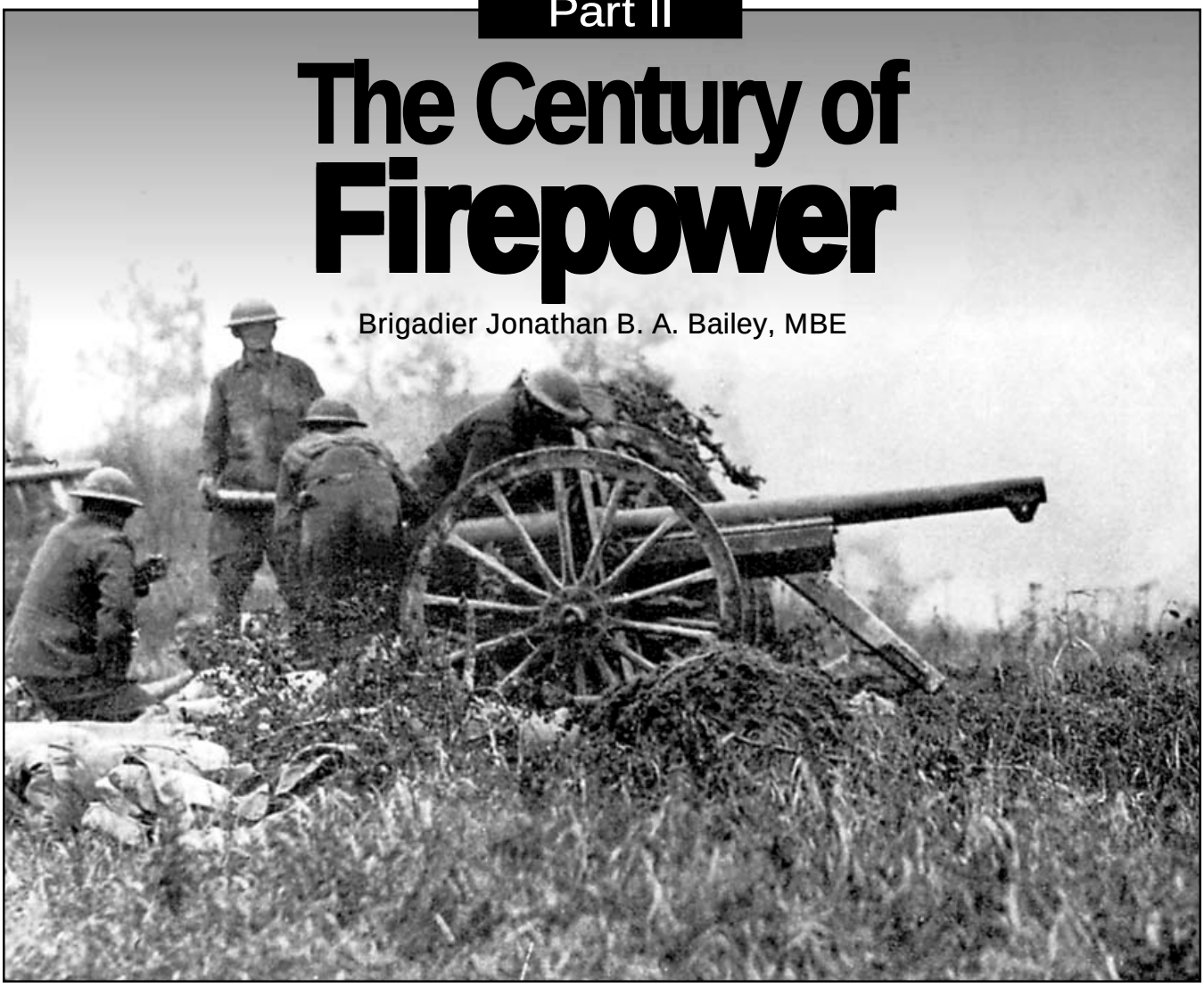


Part II

The Century of Firepower

Brigadier Jonathan B. A. Bailey, MBE



French 75 of the American 6th Field Artillery, 1st Division in Ardennes, France, 1918

Editor's Note. *This is the second of two articles exploring the concept that the First World War was the most significant revolution in military affairs (RMA) in history and that indirect firepower has persistently been underestimated. Brigadier Bailey's first article was "Deep Battle: The Birth of the Modern Style of Warfare" and was published in July-August 1998. For more comprehensive information and references, read the Strategic and Combat Studies Institute's Occasional Paper Number 22: "The First World War and the Birth of Modern Warfare" written by Brigadier Bailey. The 1996 pamphlet is available in several US military libraries or can be obtained from the Editor, Strategic and Combat Studies Institute, British Staff College, Camberley, Surrey, GU15 4NP, United Kingdom*

In the 20th century, we persistently undervalue the role of firepower in warfare and overestimate the importance of attritional ground maneuver. This article reassess aspects of the First World War, looks briefly at trends in technology and establishes the line of logic from the intellectual landmark of 1917 and 1918 through 80 years of the ascendancy of fires. The ascendancy of fires has implications for the joint and combined battle in the century of firepower.

The Underestimation of Firepower. The following four examples selected from many illustrate cases in which the underestimation of firepower has been fatal in this century.

1. Predictions of Jean de Bloch. At the turn of the century, Jean de Bloch predicted the new technology of industrialized warfare would so strengthen the defense that attacking infantry would be slaughtered in horrifying numbers. Wars would become struggles of attrition in which defeat would bring economic, social and political collapse. His views were generally regarded as perverse, and no army reassessed its doctrine in the light of the revolution in firepower he described; they preferred to retain doctrine emphasizing infantry maneuver and willpower over firepower. The prescience of Bloch's analysis was revealed in the Russo-Japanese War of 1904 and 1905.

2. Failure to Adopt Indirect Fire as a System. The effects of firepower in the Russo-Japanese War, especially indirect fire, were well-documented and changes were recommended; but the implications of restructuring armies to deliver that fire threatened the prevailing culture of élan and maneuver—"The Cult of the Offensive."

Doctrine regressed and European armies took the field in 1914 with masses of infantry maneuvering into range of each other's infantry firepower, and as their positions locked, they found they lacked the artillery firepower to gain a decisive outcome. Artillery, which had deployed in sight of its target, was usually blown away. Only by rebuilding the capability to deliver decisive fires after four dreadful years of experiment was the deadlock on the Western Front broken.

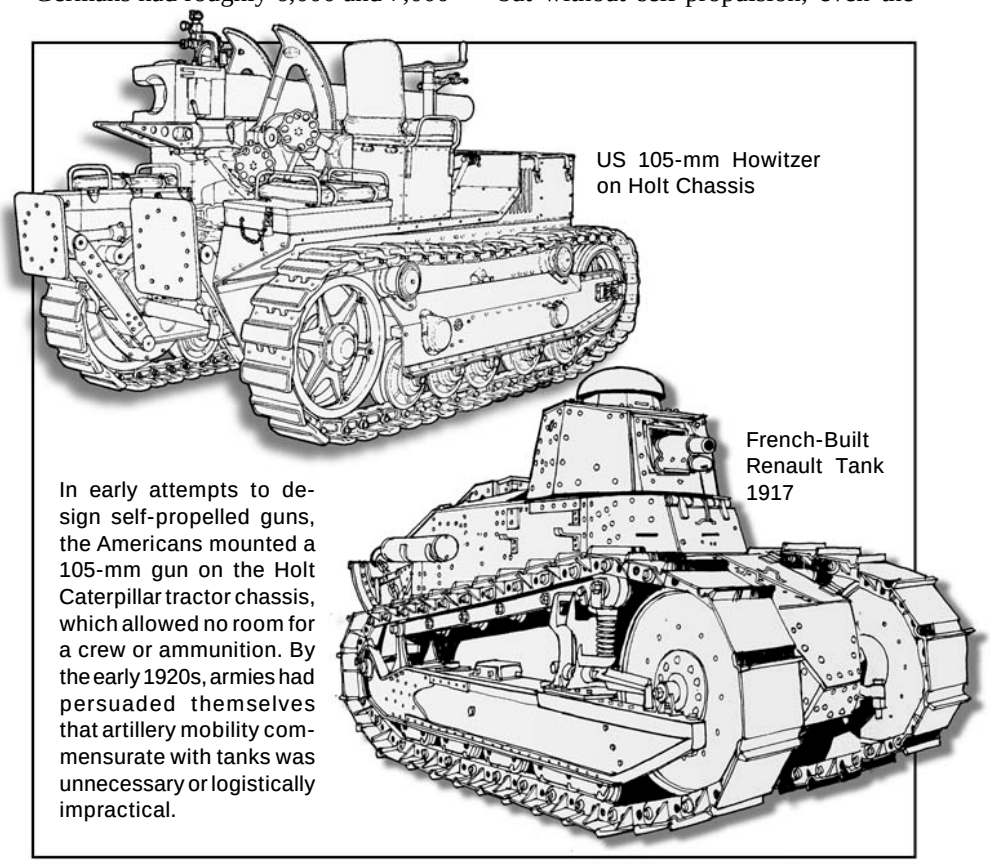
3. Abandonment of the Self-Propelled Gun. Surprisingly, after the domination of artillery in the First World War, a similar underestimation of firepower occurred again, this time in the Union of Soviet Socialist Republic. Almost immediately, a new Cult of the Offensive emerged that promised quick victories and was based on the tank. Typical of the craving to dispense with the burden of artillery was the doctrinal regression that rejected the self-propelled gun.

Self-propelled guns were first produced in 1917, but by the early 1920s, armies had persuaded themselves that artillery mobility commensurate with tanks was unnecessary or logistically impractical. They argued that tanks did not need artillery support, and since the offense was the responsibility of the tank, most artillery should be consigned to the defense. The experience of the Second World War rapidly changed perceptions, and the self-propelled gun soon became critical equipment in all major armies after 20 wasted years.

4. Stripping of Firepower from the Wehrmacht. The *Wehrmacht* grossly underestimated the importance of firepower in the crucial years 1940 and 1941 with dire consequences. It was stripped of much of its firepower in the misplaced belief that rapid armored maneuver would win the war by the end of 1941. The Germans' neglect of air power and artillery and their inability to deliver sustained firepower throughout the theater of operations proved fatal to them in the USSR.

From May to September 1940 in the Battles of France and Britain, the *Luftwaffe* lost 3,064 aircraft, 65 percent of its force. In September 1940, the month that Germany lost more planes than it produced, Hitler ordered planned aircraft production cut; that year British aircraft production outstripped Germany's. Between July and December 1941, the USSR produced 5,173 fighters and the Germans 1,619. The Germans fought the last four years of the war with inferior close air support and without a full-fledged strategic air force.[1]

Changes in artillery production and deployment illustrate the same point. In the summer of 1941, the Soviets and Germans had roughly 6,000 and 7,000 guns, respectively. The Germans broke their corps artillery into divisions, believing the artillery above the division level could not keep up with the speed of maneuver and cover the huge space of the USSR. This proved to be the case, but without self-propulsion, even the



In early attempts to design self-propelled guns, the Americans mounted a 105-mm gun on the Holt Caterpillar tractor chassis, which allowed no room for a crew or ammunition. By the early 1920s, armies had persuaded themselves that artillery mobility commensurate with tanks was unnecessary or logistically impractical.

M7 105-mm Howitzer in the Second World War. The self-propelled gun soon became critical equipment in all major armies.

divisional artillery was often left behind. Air power proved an inadequate substitute, and the Germans failed to gain territory without the appropriate firepower.

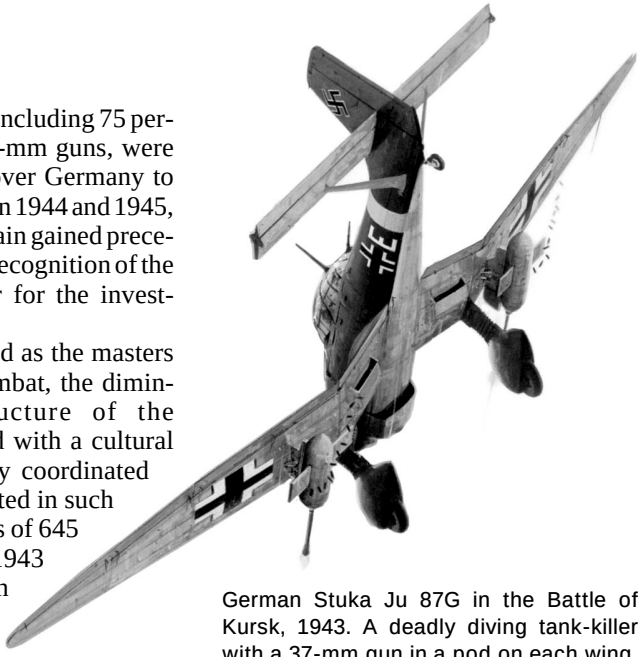
The Germans failed to develop self-propulsion earlier and concentrate their artillery decisively in 1941 and thereafter. At the same time, their priority was tank production because the tank was to be the campaign winner, as it had been in France. In July 1941 as Operation Barbarossa was launched, a 70-percent cut in artillery production was ordered, and between April and December 1941, funding for artillery ammunition was reduced from 69.1 Reichsmarks to 15.7 Reichsmarks. By December 1941, artillery ammunition production was falling fast.[2]

In contrast, the Soviets increased artillery production and deployment at all levels in July 1941, creating new "operational" artillery formations above the divisions. The Soviets learned from the First World War and, in part, from the ideas of German Artilleryman Colonel Georg Bruchmueller that they had to have firepower to win.[3]

From 1 to14 November 1941, the Soviets reinforced their Western Front with 2,000 guns as German artillery production was declining. By 1943, the Germans realized their error and tried to copy the Soviet artillery structure with *Artillerie Division 18*, but it was too late.[4] Resources to equip it were lacking, and by then, nearly one million men and 55,000 guns, including 75 percent of Germany's 88-mm guns, were pointing at the skies over Germany to counter aerial attacks. In 1944 and 1945, artillery production again gained precedence over the tank in recognition of the greater combat power for the investment.

While often portrayed as the masters of combined arms combat, the diminished artillery structure of the *Wehrmacht*, combined with a cultural predilection for poorly coordinated armored assaults resulted in such catastrophes as the loss of 645 tanks at Kursk in July 1943 and more than 600 in the Ardennes in December 1944.[5] Many studies have explained the excellence of German all-arms cooperation at the tactical level, but the failure to fight an effective all-arms battle at higher levels is less often noted; if the failure is noted, it's explained merely in terms of political interference. The failures usually are seen as symptoms of Germany's logistical weakness and ignore the fact that the imbalance between the arms was a conscious procurement decision based on skewed doctrine.

Challenging the First World War Myths. The essence of the myths of the First World War is based on the conditions on the Western Front: Millions died because the war was conducted by commanders wedded to monstrous, static, attritional tactics to win a few yards of shattered mud across trench lines that scarcely moved in five years. The horror only ended when the innovative Germans introduced "Stormtroop Tactics," revealing the primitive folly of earlier Allied offensives, and the tank was introduced to smash through the German lines leading to an Armistice. Almost none of the above is sustainable.



German Stuka Ju 87G in the Battle of Kursk, 1943. A deadly diving tank-killer with a 37-mm gun in a pod on each wing, this aircraft was very effective in Russia, but the Germans had too few to make a significant impact.

Manning arms plants hundreds of miles apart, Soviet workers assemble howitzers during the Second World War. Josef Stalin called his artillery the "god of war" and saw to it that his forces had more artillery than the Germans.

The tragedy allegedly was compounded by the fact that only the Germans learned the true lesson of this war—the need for a coherent armored doctrine. The Allies paid the price for their complacency with the German victories in 1940 and 1941, and thereafter, the tank dominated war on both sides. This view is also dubious.

The myth of military bungling emerged, in part, in the 1920s, is the reaction of liberal societies against their recent catastrophe and was reinforced by academics and the popular culture of the 1960s for whom this line struck an attractive chord.[6] The notion that there was an alternative to the horrors of the First World War was encouraged by the Nazi propaganda machine that invented the *Blitzkrieg Legende* and has been accepted uncritically by many since.[7] Such was the basis of the First World War myths, as follow.

• *Operations were typically static.* The First World War was only static for relatively limited periods and then primarily on the Western Front; elsewhere this was generally not the case. In the west, 1914 was predominantly a year of ambitious German and French maneu-

ver, while 1915 to 1917 was indeed characterized by static trench warfare. For the Allies, this was not the tactic of choice but an unwelcome prelude to the breakout and maneuver. In 1918, the latter was achieved and the war concluded.

Speeds of advance were similar to those of the Second World War, given the relatively primitive means of mobility. For example, the Allied advance in Italy from September 1943 to May 1945 was 25 miles per month and in Normandy from June 1944 to February 1945 was 50 miles per month. In France from August to November 1918, five British Armies advanced at 30 miles per month. The war, even on the Western Front, was thus not one of unrelenting static operations, even when compared to operations 30 years later.

• *Static operations are more costly than mobile ones.* Were the high casualty rates of the First World War a consequence of static operations? The tactics of the day are said to have been both fatally concerned with capturing a few yards of mud and, at the same time, unduly concerned with attritional force-on-force confrontations. Yet periods of relatively static operations were not more costly than the periods of maneuver, but rather the reverse—with the casualties due to maneuver spread over a larger area of the battlefield. The measure of success should be whether the cost of the desired outcome was optimized.

There were probably as many decisive static operations as ones of decisive maneuver, and the latter were more costly. The disastrous French maneuvers of the summer of 1914 cost 955,000 casualties, and that year the Germans suffered 370,000 casualties on the Marne and at Ypres alone. The much-lauded German operational maneuvers of spring 1918, which so embarrassed the Allies, proved expensive disasters. Between March and July 1918, the Germans probably sustained one million casualties and another 500,000 men deserted.[7] Between July 1918 and the Armistice, they probably lost another 760,000 and a further one million refused to serve or deserted.[8] By comparison, they probably lost 500,000 in the static Battle of the Somme and 350,000 in the Battle of Verdun in 1916.[9]

Static operations and maneuvers do not appear to have been inherently more decisive one than the other. The war ended with a successful maneuver following what the German High Command identified as a decisive period of attrition, which might be seen as the Allies "winning the fire fight"—the familiar ingredient in sustained success.

Germans on the Front in the First World War. Elite German Stormtroopers were created at the expense of the rest of the army in an infantry innovation designed to lever a decisive advantage-a price that proved too costly with the defeat of 27 of the 36 assault divisions in July 1918. This left a relatively low-grade majority to struggle on until the Armistice.

• *Tanks won the war in 1918.* The role of the tank in breaking the deadlock on the Western Front from 1916 onward is often seen as decisive. This was far from the case.

The tank was used spectacularly at Cambrai in November 1917, but its actions were less remarkable than firing the first predicted artillery fire plan and the innovative melding of aircraft and artillery operations. On 8 August 1918, the British Army successfully deployed 630 tanks, but thereafter the role of the tank diminished with only six occasions when more than 50 were massed and three when more than 100 were fielded. The tank's mechanical endurance was only about eight hours and its crew's endurance about two hours before motion sickness incapacitated the soldiers. Unlike horse-drawn artillery, tanks could not keep up in the fast-moving battles of the summer and autumn of 1918, and the burden of combat continued to fall on the artillery.[10]

• *German Stormtroop tactics and operations in 1918 were a success.* The German tactics often are regarded as a dazzling tactical innovation used with startling operational consequences.[11] But the quality of these elite troops was bought at too high a price for the remainder of the German Army, and it's doubtful that anything worthwhile was achieved by their sacrifice.

The popular notion of *Schwerpunkt* in German doctrine acknowledges that relative weakness must be accepted in some areas to achieve a decisive strength elsewhere. A similar imbalance is often noticeable in German force structures, creating a well-furnished elite to lever a decisive advantage, albeit at the material expense of the majority of the force. Thus, Germany selected and trained stormtroopers in 1916 and 1917, stripping the rest of the army of its best men. By July 1918, 27 of Germany's 36 elite assault divisions had been written off, leaving a relatively low-grade majority to struggle on until the Armistice.

The German Army's tactical "successes" in 1917 and 1918 often have been attributed to infantry innovation. But the system for the delivery of fire devised by Georg Bruchmueller was more significant. The mass of the German Army that assaulted Allied lines in the spring 1918 did so in primitive style. Not surprisingly, their casualties were comparable to those of Allied attackers in 1916. In many cases, the scale of their catastrophe may be attributed directly to their infiltration tactics, which caused thousands to be enfiladed by machine-gun posts, cut off and captured.[12]

A British Mark V tank put out of action by the direct fire of a German "77" in the First World War. Although the tanks of this war had a mechanical endurance of about eight hours, the crews had incapacitating motion sickness after about two.

In the spring of 1918, the German Army led by its elite formations never achieved an operational breakthrough. The *Amerika* Plan designed to win the war before the US Army could arrive in Europe in strength failed, guaranteeing that Germany would suffer strategic defeat in 1918 rather than 1919.

• *The First World War commanders typically were stupid and inflexible.* By today's standards, many of the commanders had an unacceptably high tolerance of casualties. This was the result of their refusal to acknowledge the strength of modern defensive technology and the demand for self-sacrifice by troops maneuvering in the face of it. The quality of these same commanders was apparent when they changed their approach, creating the revolution in military affairs (RMA) described in my first article. They were perhaps the greatest innovators in military history.

• *The Germans learned the right lesson from the First World War, and the French got it wrong.* It is often held that the Germans were successful with the *Blitzkrieg* while the French executed the folly of the Maginot Line and the *Bataille Conduite.* This is a false comparison. The French imperative was to deter and defend, avoiding another war with Germany. The Germans designed a force to win a war they intended to initiate, an offensive.

The fair test of whether the French were wrong and the Germans wise, is one that demonstrates whether or not the Germans would have adopted a different approach to that of the French if their imperative had been to defend. From 1941, defense was the German imperative in the west and, shortly after that, in the east as well. In the defense, the Germans proved themselves probably the greatest planners and builders of static fortifications in history. The Atlantic Wall and a series of lines in Italy dwarf anything built by the French. The German forts at Breslau and Boulogne were as much recreations of Forts Vaux and Douaumont as anything on the Maginot Line, and they possessed curiously puny firepower.

The paralysis that gripped the German decision makers in the days after D-Day in 1944 is similar to that which beset the French in the crucial moments of May 1940 when their linear defense failed and the enemy appeared on an unexpected flank. The German strategic and operational leadership, which had seemed so deft and decisive when it held the initiative in the offense in May 1940, looked anything but that in the defense in June 1944.

German tanks with armored cars regroup in Russia at the Battle of Kursk 1943. The human catastrophe at the hands of well-orchestrated Soviet and Allied firepower is seldom laid at the feet of the German's fatal, armored offensive doctrine-another Cult of the Offensive.

It is not that the Germans' approach in 1940 was right and the French wrong, rather they were approaches to different strategic objectives. In admiring the German military approach, the unwary also are paying tribute to its flawed strategic imperative. Their success in 1940 was often in the balance, and the decisive factor was the distinctive German style of command and risk taking, admirable no doubt at the tactical level but generally unacceptable in a democracy at any other.

• *The futile operations of the First World War were worse than those of maneuver in the Second World War.* After the First World War, the *Wehrmacht* was designed to fight a war on different terms. The error was not in a misreading of the fundamentals of the First World War, but rather, having identified them very clearly, in the determination to substitute rapid maneuver for fire superiority, repeating the intellectual errors of 1905 to 1914.

The emphasis was on maneuver by an armored elite to win a quick victory at low cost rather than the provision of sustained firepower in decisive time and space. Despite many misgivings and helped by extreme good fortune, the flawed German approach was fatally endorsed by the victories of 1940. The underlying fundamental, the ascendancy of firepower, became evident soon after, over-ruling wishful thinking. The Germans were fated to refight their military anathema, while woefully ill-equipped and configured to succeed.

The Second World War was to be even more costly for Germany than the first, and its campaigns more attritional. But because the campaigns initially involved dramatic maneuver, the human catastrophe at the hands of well-orchestrated Soviet and Allied firepower is seldom laid at the feet of the German's fatal, armored offensive doctrine—another Cult of the Offensive.

From 22 June to 26 August 1941 in Operation Barbarossa, the successful maneuver by which the *Wehrmacht* forced its head into the Soviet noose, the Germans suffered 440,000 casualties, a rate seldom seen in the First World War. By December, German casualties had reached 830,000. This was an operational disaster of greater magnitude than Verdun, ensnaring the Germans in a *Materialschlacht* far exceeding that of the First World War.[13] After 1942, much of the fighting on the Eastern Front degenerated to a primitive, low-technology, static warfare typical of the middle years of the First World War for which the Soviet doctrine based on fires was configured to fight.[14]

German planning had been based not on military calculation, but rather the ideological conviction that, as Hitler put it, "Kick in the door and the whole rotten edifice will fall down," and German maneuver doctrine had been an accomplice to this error. Its devotion to the unbalanced doctrine of lightning armored warfare was ultimately the undoing of the *Wehrmacht*.

• *The First World War doesn't matter to us now.* Today's concepts for the delivery of fires were founded on operations in the First World War. Two-

dimensional warfare, the direct fire contact battle, had been the style of warfare for millennia until 1917 and 1918. Thereafter, the ability to deliver fire indirectly through the third dimension to fight the deep battle as well the close battle revolutionized warfare; and the delivery of joint fire at the decisive time and place has been the dominant theme in warfare ever since. The lines of its development also have been strikingly constant, with ever-improving acquisition; range; stand-off capability; precision; command, control, communications and intelligence (C^3I); and terminal effects. The manner in which fires are delivered today and the appearance of the wars and engagements in which they are used look very different than those of 80 years ago, but these are appearances rather than underlying concepts. Another dimension may emerge making Cyber War the dominant method of warfare; but in the near future, it will probably serve merely to make three-dimensional warfare in its various forms more efficient.[15]

The Evolution of Military Technology. There is an apparent pattern in the evolution of military technology: First, the military utility of a technical development is noted and usually found wanting; sometimes the concepts of those employing it are scorned as being excessively ambitious or mistaken. For example, the Germans were offered a form of radar in 1916 but turned it down because it needed at least six months more work.[16]

The moment arises when someone has the foresight to transform a technical capability into a system, and it becomes a dominant technology rather than merely a piece of clever science. This pattern applies to indirect fire: it had been demonstrated before 1914; by 1918, it had become the decisive system of war and has remained so today as joint fire in many different forms. The US forces' current efforts to systematize the "digit" also fit this pattern.

In time, the disproportionate effects of a system diminish and others supersede it. The figure displays this phenomena in the evolution of military technology. Strategic artillery is likely to remain a dominant factor in warfare. But in the future, the distinction between tactical, theatre and strategic artillery, as between the close, deep and rear battles, will disappear as even more capable ground fires are integrated with air fires in simultaneous attacks.

In the 20th century, the balance of capability has tilted in favor of fire over maneuver, and sustained success has most often been achieved when maneuver is synchronized with decisive attack by fire. There have been examples in

	American Civil War	Franco-Prussian War	Russo-Japanese War	First World War	Second World War	Cold War	Future ?
Experimental Use	Long-Range Rifle Rail Transport	Machine-Gun	Indirect Artillery	Tanks Strategic Artillery Chemical Weapons EW Air	Nuclear Weapons Helicopters TGM	Attack Helicopters	Cyber-War Genome Kampf
Flawed Immaturity	Long-Range Rifle Rail Transport	Machine-Gun Rail Transport	Indirect Artillery Machine-Gun	Indirect Artillery Tanks Chemical Weapons Internal Combustion EW Air	Strategic Artillery Nuclear Weapons CAS BAI AI	Biological Warfare Helicopters TGM	Cyber-War
Maturity	Rail Transport Muzzle-Loaders Bayonet	Long-Range Rifle Rail Transport Bayonet	Long-Range Rifle Rail Transport Bayonet	Long-Range Rifle Machine-Gun Indirect Artillery	Tanks Internal Combustion EW CAS Strategic Bombing	Tanks Strategic Artillery Chemical Weapons Nuclear Weapons Tpt Helicopters EW, BAI, AI Information Warfare	Strategic Artillery Chemical Weapons Biological Warfare Nuclear Weapons Attack Helicopters TGM
Dominance	Muzzle-Loaders		Long-Range Rifle Bayonet	Long-Range Rifle Machine-Gun Indirect Artillery Rail Transport	Indirect Artillery Rail Transport	Tanks Strategic Artillery Internal Combustion EW CAS BAI Strategic Bombing	Strategic Artillery Nuclear Weapons Internal Combustion EW Information Warfare BAI AI TGM
Diminution		Muzzle-Loaders		Long-Range Rifle Bayonet	Machine-Gun	Indirect Artillery Rail Transport	Tanks Internal Combustion CAS

Legend:
AI = Air Interdiction
BAI = Battlefield Air Interdiction
CAS = Close Air Support
EW = Electronic Warfare
TGM = Terminally Guided Munitions
Tpt = Transport

3d Warfare Revolution
Indirect Fire

4th Warfare Revolution
Information Warfare

The Evolution of Military Technology

20th century warfare where *coup de main* operations or dazzling, but poorly supported, ground maneuver have succeeded. Such operations and campaigns have tended to be highly risky and often have not been sustainable or successful in the longer term, leading to disaster.

Equally, there have been examples where sudden attack by fire alone has proven decisive. The means to generate firepower, however, is not of itself enough to guarantee success—as was shown in Vietnam. Misapplied, firepower even may be counter-productive.

VII Corps Multiple-Launch Rocket System in Operation Desert Storm. Desert Storm achieved outstanding success through the application of meticulous joint fires in conjunction with maneuver.

Success requires the application of decisive fire harmonized with maneuvers focused on achievable strategic objectives. An operation such as Desert Storm achieved outstanding success, primarily through the application of meticulous joint fire planning in conjunction with maneuver and a clear strategic direction. The overwhelming evidence supports a formula that is so orthodox as to need little advertisement: win the fire fight decisively and, thereby, gain the freedom of action to exploit it with maneuver in the most effective manner to conclude the matter at optimal cost.

An astonishing aspect of warfare this century has been that military establishments have frequently resisted this conclusion in defiance of the evidence and neglected to develop their capacity to deliver fires, denying their self-evident lethality, preferring instead to construct models that might obviate these facts. This often has been in response to strategic direction and the inclination of military cultures that tend to favor ground maneuver. Wishful thinking often failed to match the actual technological capabilities of the day, and many were distressed when their doctrinal constructions were revealed as lethally flawed, creating worse outcomes than the paradigms they were seeking to avoid.

In a familiar pattern, the dominance of fires tends to reassert itself in combat, ground maneuver proves too attritional and forces are restructured in wartime to reflect this. Thus what should be regarded as orthodox in 20th century warfare has more often been regarded as regressive and heretical in peacetime.

Happily there is an increasing congruence in Western societies between their technological capability to generate firepower and their desire not to commit troops unnecessarily to attritional ground maneuvers and short-range combat with the enemy, which were so often the objectives of doctrine and the causes of disaster in the past. Today, it is fires or "fire maneuver," not ground maneuver, that is the "Maneuverist" in the sense of leveraging combat power, undermining an enemy's will and avoiding attrition to friendly forces.

In this century, ground maneuver too often has been seen as the best means of avoiding close combat and its ensuing casualties. Today, we should be cautious lest "fire maneuver" be propounded in the same manner, and we should not underestimate the efficacy of "boots on the ground" or the need, on occasion, to close with the enemy. However, a doctrine based on the application of firepower is likely to prove the most suitable for Western societies; and the confidence to assert this comes from the bitter experience of the 20th century and the tragic cost of ignoring that evidence.

Brigadier Jonathan B. A. Bailey, Member of the British Empire (MBE), is the Chief of Fire Coordination for the Allied Command Europe Rapid Reaction Corps in Germany. He commanded the 40th Field Regiment in Germany and a battery in the 4th Field Regiment of the Royal Artillery. He also served as a Tactics Instructor and member of the Directing Staff at the Staff College in England, from which he is a graduate, and as the Artillery Operations Officer for the 4th Armoured Division in Germany. Other highlights of his service in the British Army include commanding a Zipra guerrilla Assembly Place in Rhodesia as part of the Commonwealth Cease-Fire Monitoring and serving as an Operations Officer and Battery Commander during the Falklands Campaign. Brigadier Bailey is a graduate of the Higher Command and Staff College. He has written a number of articles and books on the subject of artillery and military history.

Notes:

1. D. Irving, *The Rise and Fall of the Luftwaffe. The Life of Erhard Milch'* (London: Weidenfeld and Nicholson, 1973).
2. J. Ellis, *Brute Force* (London: A. Deutsch, 1990), 46-48. In December 1941, Germany produced 9,000 light howitzer shells but consumed 1,260,000. See J. Engelmann, *German Artillery in World War II* (Atglen, PA: Schiffer, 1995), 112. Many statistics about artillery are confusing because self-propelled gun production is often grouped with that of tanks.
3. Bruchmueller's work was brilliantly described by David T. Zabecki in *Steel Wind: Colonel Georg Bruchmueller and the Birth of Modern Artillery* (Westport, CT: Praeger Publishers, 1994); Soviet Marshal F. I. Kulik asserted that tanks were "a sheer waste out of which the artillery would make scrap," as quoted from E.F. Ziemke, "The Soviet Armed Forces in the Interwar Period," *Military Effectiveness*, Edited by A. R. Millett and W. Murray (Winchester, MA: Allen and Unwin, 1988), 32.
4. Jonathon B. A. Bailey, *Field Artillery and Firepower* (London: Oxford Press, 1989), 221-222.
5. Ibid., 200-206.
6. M. Stephen, *The Price of Pity* (London: Leo Cooper, 1996).
7. K-H Frieser, *Blitzkrieg Legende* (Muenchen: Militaergeschichtliches Forschungsamt im R Oldenbourg Verlag, 1995).
8. T. Travelers, *How the War was Won: Command and Technology in the British Army on the Western Front 1917-18* (London: Routledge, 1992), 154-157.
9. Casualty figures for the First World War are wildly inconsistent and require further research. Those given in this article reflect recent estimates. It's interesting to note that the worst casualties were sustained on the mircrobial front with 25 million deaths in 1918 and 1919 attributed to the great influenza epidemic. G. Noon, "The Treatment of Casualties in the Great War," *British Fighting Methods in the Great War* (Ilford Essex: P. Griffith, 1996), 209-227.
10. Bailey, 209-227.
11. Bruce Gudmundson has described the evolution of German thinking, organizational change and practice in *Stormtroop Tactics,* (Westport, CT: Praeger Publishers, 1989.) The French were influenced by similar innovative infantry tactics, devised by Andre Laffargue as early as May 1915, although these were not implemented systematically. The British included such tactics in their platoon training manuals as early as February 1917 to be practiced by all. See P. Griffith, *Battle Tactics of the Western Front,* (New Haven, CT: Yale, 1994), 194.
12. The evidence is taken from the battle between the British 55th Division at Givenchy facing four German divisions on 9 April 1918. The band instruments were collected later as trophies.
13. Ellis, 72.
14. O. Bartov, *Hitler's Army* (Oxford, England: Oxford University Press, 1992), Chapter 1.
15. R. J. Bunker has speculated about a BlackFor Cyber-State as an opponent, challenging the view of the US Department of Defense that "…the strategic environment of 2020 will be much like that of 1997." See, *Five-Dimensional (Cyber) Warfighting,* SSI Paper, (US Army War College, Carlisle Barracks, PA, 10 March 1998), 3. The diversification of warfare rather than dominance of Cyber War is the most likely development in the coming decades.
16. W. Murray and A. Millet (ed.), *Military Innovations in the Interwar Period* (Cambridge, England: Cambridge, 1996), 268.

OCS Hall of Fame

The Robinson Barracks area along Jones Road near I-See-O Hall on Fort Sill, Oklahoma, housed the FA Officer Candidate Course (OCS) that graduated classes from 1941 until 1973, giving the Army a flow of more than 47,000 second lieutenants for World War II, Korea and Vietnam. This institution gave us many distinguished leaders in its 32 years.

To honor the significant contributions of these graduates to our Army and the nation, the FA OCS Hall of Fame was established in 1968 and is housed in Durham Hall, Building 3025, on the corner of Austin and Jones Roads. Durham Hall is the administration and reception building of the original OCS.

Every year, OCS graduates are inducted into the Hall of Fame during the US FA Association OCS Chapter's reunion at Fort Sill. To date, 801 FA OCS graduates have been inducted based on their rank of colonel or higher, the award of a Medal of Honor (MOH) or Distinguished Service Cross (DSC), appointment or election to an office of national prominence, and service to their community, profession or vocation.

History of OCS. The Army's officer candidate schools were inaugurated under the authority of a War Department directive dated 26 April 1941. The FA OCS was established at Fort Sill with the first class of 125 candidates who started 10 July 1941. That same year, a second class of 125 reported 19 August. The 13-week course was for warrant officers and enlisted men who had served at least six months' service at the date of enrollment in the course. The course covered gunnery, communications, tactics and other subjects. In mid-1943, it was expanded to 17 weeks to include more instruction on tactics and in Army administration, military law, mess management and other general military subjects.

General R.N. Danford, World War II Chief of Field Artillery, and Brigadier General George R. Allin, Commandant of the FA School, set early procedures and standards for their OCS candidates. They directed the candidates be worked as hard as possible to weed out those who could not take the pressure.

As originally organized in June 1941, a Commandant of Candidates headed OCS with a staff of three-the first Commandant was the late Captain Carl H. Jark, who retired as a lieutenant general. When an OCS cadre member invoked the term "Jark," it meant the candidate(s) had to run up and down Medicine Bluff 4 (MB4) at port arms, a physically onerous task.

By November 1942, the staff had expanded to 66 officers and the course capacity was 6,600 candidates: 12 classes of 550 candidates each. The candidates were organized by classes, four to a battalion. Each class was broken into sections of approximately 30 candidates.

With the fall of the Japanese Empire and the cessation of hostilities in August 1945, the need for FA officers became less critical. On 12 December 1946, the FA OCS officially was closed. By this date, 26,209 second lieutenants had graduated and were commissioned from the FA OCS.

The outbreak of hostilities in Korea demanded an immediate response, so the FA OCS reopened on 21 February 1951. In 1954, several National Guard classes were established for a rigorous 11-week course. Then in June 1957, Army Reserve classes began a similar program.

Due to the conflict in Southeast Asia, the 1967 enrollment increased, and within a few months, the FA OCS had six battalions with 42 batteries. For the next few years, the FA OCS consolidated its program to parallel the decreasing need for lieutenants. Then on 7 July 1973, after the American withdrawal from Vietnam, the FA OCS officially closed with a graduating class of only 26. During it's 32-year history, the FA OCS graduated 47,500 second lieutenants.

Hall of Fame. In November 1967, Colonel Marlin W. Camp, Commander of the Officer Candidate Brigade, directed Colonel Henry A. Grace, the Deputy Commanding Officer, to form a committee of officers to consider creating a Hall of Fame. The result was the US Army Artillery and Missile Center at Fort Sill established the FA OCS Hall of Fame by General Order 115 on 29 June 1968.

Two FA OCS inductees have been recipients of the MOH, both posthumously: First Lieutenant James E. Robinson (Class of 62-43) and Second Lieutenant Harold B. Durham, Jr. (Class of 1-67). Lieutenant Robinson, the only Field Artilleryman to win the MOH in World War II, won the medal for his actions in an attack near Untergriesheim, Germany, in 1945. The FA OCS area was named "Robinson Barracks" in his honor. Lieutenant Durham received his MOH for actions in Southwest Asia. The OCS Hall of Fame "Durham Hall" is named in his honor.

Other remarkable OCS graduates have been inducted into the Hall of Fame-for example, H. Malcolm Baldrige (Class 91-44), a former Secretary of Commerce; Martin R. Hoffman (Class 71-55), a former Secretary of the Army; and retired Generals Jack N. Merritt (Class 35-53), former Senior US Military Representative to NATO, and John M. Shalikashvili (Class 4-59), former Chairman of the Joint Chiefs of Staff. In fact, the serving Chief of Field Artillery, Major General Leo J. Baxter (Class 6-70), is a graduate of the FA OCS.

The 1999 OCS Chapter Reunion and Hall of Fame Induction will be 20 and 21 May. At that time, the OCS Chapter of the US FA Association will receive physical and financial responsibility for the Hall of Fame from the Army with the sponsoring 1st Battalion, 78th Field Artillery of the Field Artillery Training Center giving up the keys to Durham Hall.

To join the chapter or get more information on the reunion and OCS Hall of Fame, contact the US Field Artillery Association at (580) 355-4677, Fax at (580) 355-8745 or email usfaa@sirinet.net.

CPT Larry D. Pool, Cdr, HSB
1-78 FA, FATC, Fort Sill, OK

Training and Maintaining AFATDS
The Red Team Way

by Colonel David C. Ralston and
Captain Thomas R. Bolen

After the initial fielding and training of the advanced Field Artillery tactical data system (AFATDS) was completed in 1995, the 1st Cavalry Division Artillery, Fort Hood, Texas, faced the challenge of designing a unit program to sustain AFATDS training and maintenance. This proved to be a daunting task. After several trial and error programs, the solution involved a series of initiatives using military and civilian agencies to promote soldier skills and ensure equipment readiness.

Red Team Training. With the fielding completed, the 1st Cavalry Division Artillery worked with the Project Manager AFATDS (PM AFATDS) and the Training and Doctrine Command (TRADOC) System Manager AFATDS (TSM-AFATDS) to help influence training programs. One of the biggest challenges encountered in developing our AFATDS program was the lack of initial training among newly assigned officers, NCOs and soldiers. Because most of the FA community had not yet fielded AFATDS, even the instruction provided at the FA School at Fort Sill in the officer basic course, captains career course, basic NCO course and advanced individual training focused only on "legacy" systems, such as the initial fire support automation system (IFSAS).

This lack of institutional training coupled with the fact that soldiers who had gone through AFATDS new equipment training (NET) began departing Fort Hood, the Red Team had to develop four training initiatives to maintain AFATDS proficiency.

1. Coordinated with FA School for AFATDS courses. First, in conjunction with TSM-AFATDS, the Field Artillery School began to identify Fort Hood-bound soldiers in the relevant military occupational specialties (MOS) to attend the AFATDS Operators Course at Fort Sill before moving to Fort Hood. These included MOS 13C Tactical Fire Direction Specialist, 13E Fire Direction Specialist, 13F Fire Support Specialist and 13P Multiple-Launch Rocket System (MLRS) Fire Direction Specialist. This initiative provides a valuable knowledge base for new soldiers and allows the individual to focus on learning unit-specific digital tasks once he reports.

Additionally, to maximize participation in the courses offered at Fort Sill, we centrally directed our battalions to fill a prescribed number of student slots.

The number of slots assigned for each battalion to fill is coordinated with the unit's training cycle so soldiers aren't absent for field exercises or deployments to the National Training Center (NTC), Fort Irwin, California.

2. Developed local operator and leader courses. To supplement Fort Sill courses, the Div Arty developed some internal courses. The intent is to conduct operator and leader courses every quarter, preferably with a direct support (DS) battalion as a base unit. Ideally, course planners select the battalion training for an NTC rotation.

Senior NCOs from the division fire support element (FSE) and Div Arty fire control element (FCE) serve as instructors for the courses. Students are organized in a sensor-to-shooter chain that includes operational facilities (OPFACs) from the division main FSE down to the firing platoon operations center (POC). This allows soldiers to train on the OPFACs they man in their units. For instance, a soldier assigned to a brigade FSE OPFAC will train on that system in the course.

The student also uses the Red Team AFATDS tactical standing operating procedures (TACSOP) that familiarizes him with the types of messages and fire missions he will see during actual operations. Written and continuously updated by our senior NCOs, the TACSOP reflects five years of experience with the system and outlines the procedures for constructing a database and conducting AFATDS operations.

With Fort Hood as our home, the Red Team is fortunate to have access to an AFATDS field integration team (FIT). Consisting of several contractors from the Raytheon Corporation, the FIT serves as a hub of subject matter experts for AFATDS hardware and software.

In addition to supporting Div Arty units during garrison and field training, the FIT conducts two vital courses in the Red Team training plan: System Administrator Course and Power and Communications Course. The System Administrator Course targets senior NCOs in key AFATDS leadership positions and instructs them on advanced troubleshooting and maintenance procedures. Armed with these skills, the NCOs return to their units with the ability to diagnose and, in many cases, repair routine maintenance problems in the field.

The Red Team's Power and Communications Course targets communications specialists, particularly MOS 31U soldiers, and generator mechanics, MOS 52D soldiers. These soldiers receive training on the "big picture," which includes the standardized integrated command post system (SICPS), power generation systems and all communications equipment as well as an introduction to AFATDS.

During quarterly battery training briefs, we require battery commanders to brief their units' attendance record at AFATDS schools to ensure every operator is trained either locally or at Fort Sill.

3. Refined Fire Support Sustainment Training (FSST). Digital skills are inherently perishable. Providing initial training to soldiers is only half the battle; sustainment training is the critical second half.

The 1st Cav Div Arty conducts sustainment training in two ways. First, the Div Arty commander requires all Red Team units perform eight hours of digital training per week. Units focus on basic digital communications, database construction and fire mission processing.

On a quarterly basis, FSST is conducted at the Div Arty level. The division FSE and Div Arty FCE work together to select a theme, such as counterfire or suppression of enemy air defenses (SEAD), and build a supporting database and tactical scenario. The training generally includes a series of short classes to familiarize participants with the focus of the exercise. These classes add variety to the training and serve as good professional development tools. The three-day event builds from the classes to database construction and fire mission processing and eventually culminates with a command post exercise (CPX).

1st Cav Div Arty

All Red Team units must perform eight hours of digital training per week, focusing on basic digital communications, database construction and fire mission processing.

Red Team Maintenance. The old Army adage that "maintenance is training" certainly holds true when it comes to AFATDS operations. At one point in 1997, the maintenance operational readiness (OR) rate had fallen to 60 percent, which dramatically reduced the amount of training we could conduct. We had to improve our maintenance programs to continue training.

Initially, contractors augmented our maintenance. Systems not fully mission capable were exchanged on a one-for-one basis. Later, we transitioned to a warranty system for the transportable computer units (TCUs), Pentium lightweight computer units (PLCUs) and lightweight computer units (LCUs). The Tobyhanna Army Depot forward repair activity performed most TCU repairs on post. Units routed the systems through normal maintenance channels, and the forward repair activity turned most jobs around in a week or less. PLCUs and LCUs under warranty were shipped to Litton Data Systems for repair, with a contractual turnaround time of 72 hours.

As warranties expired, however, OR rates began to fall. We had to develop a normalized maintenance system. To do this, we developed three maintenance initiatives.

1. Improved the main support battalion's ability to repair AFATDS. The division's main support battalion (MSB) performs maintenance on those systems with expired warranties. To posture for support, the MSB commander traveled to Litton to work through several maintenance issues. He returned with a detailed list of replacement parts, stock numbers and ordering procedures. This resulted in a more robust bench stock that significantly reduced the overall turnaround times for the LCUs.

1st Cav Div Arty

As the digitized battlefield approaches, the Red Team envisions a need for specially trained NCOs with years of AFATDS experience to serve as Digital Master Gunners at the Div Arty and battalion levels.

2. Merged AFATDS into vehicle systems and entered them into the unit-level logistics system (ULLS). As we became increasingly responsible for the overall maintenance program, the Div Arty recognized a need for better tracking procedures for non-mission capable systems. As a first step in developing these procedures, our units conducted comprehensive inventories and forwarded the results to the responsible property book team. The inventories rectified accountability gaps created by the evolution from the experimental, direct-exchange system to a normalized system. Our next step involved ensuring all units entered the AFATDS hardware devices into ULLS—the key to providing the commander an accurate status of his digital systems.

The Red Team went one step further and required units assign each system a bumper number and associate it with a dedicated vehicle. This action raised the visibility of non-mission capable equipment: deadlined AFATDS equipment *equals* a deadlined vehicle. These initiatives have increased the overall OR rate of our digital fire support equipment.

3. Declared AFATDS hardware as division pacing items. We also increased visibility by designating AFATDS-related hardware as division pacing items. The overall status is reported and briefed during monthly material maintenance reviews (MMRs).

These maintenance initiatives, together with our educational efforts—in particular, our System Administrator Course—have been very successful in improving the overall OR rate of digital fire support equipment. Since March 1998 when the program went into effect, our OR rates have gone from 60 to 83 percent for our LCUs, 74 to 90 percent for PLCUs and 83 to 95 percent for TCUs.

Future AFATDS Program. The future holds some challenges for the Red Team. We received several sets of the common hardware system 2 (CHS-2) in accelerated fielding in order to support the 1st Cavalry Division's assumption of the stabilization force (SFOR) mission in Bosnia. Coupled with the concurrent fielding of AFATDS 97 software, our units deployed with 21st century fire support technology.

The Div Arty's extensive experience with AFATDS led to another initiative: recommending changes to the existing fielding template. While the template that outlines the number and type of systems for a particular unit has changed little since the experimental phase, the Red Team has changed the way it looks and fights. Such recommendations are to add a system to support split-tactical operations center (TOC) operations in the aviation brigade and to use upgraded rigid wall shelters to support the Div Arty light TOC concept; these recommendations are based on Warfighter exercises and NTC rotations. Our long-range goal is to influence the structure of AFATDS-based modified tables of organization and equipment (MTOE) so it reflects the proper system template with the correct vehicle configurations and number of qualified personnel to operate on tomorrow's digitized battlefield.

As the digitized battlefield approaches, the Red Team also envisions a need for specially trained NCOs with years of AFATDS experience to serve as Digital Master Gunners at the Div Arty and battalion levels. These individuals should have a fire support or fire control background and experience as unit system administrators. Similar to the Master Gunner found in many artillery units, the Digital Master Gunner would be the expert on training, maintenance, simulation and interoperability issues.

From the first operational tests through four major software fieldings, two hardware fieldings, many NTC rotations and real-world deployments to Kuwait and now Bosnia, the 1st Cav Div Arty has developed and streamlined AFATDS training and maintenance procedures. And we'll continue to integrate this innovative fire support system into all our warfighting operations today and in the future—*The Red Team Way*.

Colonel David C. Ralston commands the 1st Cavalry Division Artillery at Fort Hood, Texas. In July, he will become the Chief of Staff of Fort Sill, Oklahoma. He also commanded the 3d Battalion, 1st Field Artillery, 3d Infantry Division (Mechanized) in Germany; a Lance firing battery in the 6th Battalion, 33d Field Artillery at Fort Sill, the same battalion in which he also served as Fire Direction Officer; and Headquarters and Headquarters Battery, 1st Armored Division in Germany. Colonel Ralston was the S3 of the 2d Armored Division in Germany and Executive Officer of the 1st Cavalry Division Artillery.

Captain Thomas R. Bolen commands C Battery, 2d Battalion, 82d Field Artillery in the 1st Cavalry Division Artillery at Fort Hood. In his previous assignment, he was the 1st Cavalry Division Artillery Fire Direction Officer for 18 months. He also served as a Company Fire Support Officer, Battery Fire Direction Officer and Executive Officer and Support Platoon Leader, all with the 1st Battalion, 319th Field Artillery of the 82d Airborne Division at Fort Bragg, North Carolina.

OBC: Training the New Lieutenant

A survey of FA commanders revealed that producing capable platoon leaders, fire direction officers (FDOs) and fire support officers (FSOs) in the Officer Basic Course (OBC) at the FA School, Fort Sill, Oklahoma, was not enough. Commanders want thinking young leaders who are equipped with knowledge of army values and operations-leaders able to adapt to rapid technological advances. Answering the call, the Gunnery Department, the proponent of OBC, modified the course to produce new Redleg officers who can meet these challenges.

OBC lieutenants in "Shoot Shack" (FDC) computing firing data.

The modifications to the 19-week course include designing a module instructional format to facilitate learning, increasing hands-on training and NCO involvement, emphasizing automation, and focusing the lieutenant on his gaining unit's systems through specialized tracks. Finally, the number of student leadership positions were increased significantly and leadership training was added, supplemented by a senior mentor program to further develop the new lieutenants' understanding of Army values, leadership and the real-world Army. (See the article "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit" in this edition.)

The course begins with the four-week Platoon Leader Module taught by senior NCOs. This module teaches platoon operations, howitzer crew-drill, use of the aiming circle, supply and maintenance and mounted and dismounted land navigation. In the 383-hour Fire Direction Module, students learn basic manual gunnery techniques that carry over into the instruction for automated mission processing on the battery computer system (BCS); registration with BCS; special situations (copperhead, illumination and fire plans); trouble shooting; and safety.

The Fire Support Module is 360-hours long and uses call-for-fire simulation exercises and live-fire shoots to build a sound fire support foundation. Lieutenants learn offensive and defensive fire planning to integrate fire support into combined arms operations. The module emphasizes the use of the fire support execution matrix (FSEM) and the fire support scheduling worksheet.

Also during the Fire Support Module, all lieutenants go through the Light FSO Lane. They complete a dismounted course of deliberate attacks, call for and adjust FA fires as well as coordinate other fire support. Future plans include adding movement-to-contact and search and attack mission training.

In the past, one OBC FDC controlled four to six howitzers while other FDCs followed missions in a "dry" status. We increased the number of fire direction centers (FDCs) used for OBC simulation exercises and live-fire shoots. Today, an FDC controls a single howitzer, allowing each FDC and howitzer team to process and fire active missions. With the addition of more BCS, the goal is to have no more than two students per system.

Students establish and maintain an FDC in three command post exercises (CPXs) throughout the course. The CPX scenarios are directed by the initial fire support automation system (IFSAS). Future plans call for the scenarios to replicate National Training Center (NTC) or 29 Palms rotations.

Twenty-four hours of instruction and practical exercises on the Guard Unit Armory Device Full-Crew Interactive Simulation Trainer (GUARDFIST) develops lieutenants' call-for-fire skills. In addition, the Janus facility at Fort Sill practices those skills in offensive and defensive computer simulations that require lieutenants to track and coordinate fires throughout a battle.

Students also use the Paladin Computer Trainer, a PC-based simulator that processes digital communications with a multimedia kit that adds sound for more realism. The PC can be connected to the lightweight computer unit (LCU) in the platoon operations center (POC) to simulate field exercises in a classroom environment, developing fire direction and howitzer crew skills simultaneously. Lieutenants learn how to initialize Paladin's fire control system, process move orders, emplace and process fire missions.

For one week of OBC, the lieutenants focus on the type of organizations and weapons specific to their gaining units in a specialization track-Heavy or Light. All OBC students receive two hours of training on the multiple-launch rocket system (MLRS), but those bound for MLRS units receive 64 hours of instruction on the system at the end of OBC.

The OBC capstone event-the Redleg War-evaluates the student as a cannoneer (if possible, on the gaining unit's system) and as an FDC member. The lieutenants serve as company FSOs in mechanized fire support training lanes, the Mech Run. They also receive familiarization training on the Q-36 radar and learn the capabilities and employment of close air support (CAS) during a two-hour live-fire practical exercise.

The goal of OBC is to start new lieutenants out right with the values, skills and knowledge they need to be well-rounded new Field Artillery leaders on the cutting edge.

CPT Ferdinand Burns III
OBC Instructor, Gunnery Department
FA School, Fort Sill, OK

The FA Wargame Synchronization Matrix

by Lieutenant Colonel Patrick J. Sweeney

3d Infantry Division Artillery in Kuwait

Synchronization of Field Artillery (FA) operations in time, space and purpose is a challenging task. Combat training center (CTC) trends publications have noted that FA battalions have difficulty in fully synchronizing their operations. A key step in the military decision-making process (MDMP) for synchronizing operations is course-of-action (COA) analysis—the heart of which is the wargaming process. However the primary tool for wargaming and recording the results, the standard battlefield operating system (BOS) synchronization matrix, is written from the perspective of the maneuver commander and his staff. This matrix doesn't cover all the functions a direct support (DS) FA battalion must perform to synchronize its operations.

This article outlines the FA wargame synchronization matrix recently adopted for use in the White Paper "Fire Support for Brigade and Below" written by the Fire Support and Combined Arms Operations Department of the Field Artillery School. (The White Paper is summarized in an article by the same title in this edition written by Major David A. Lee; the entire White Paper is available at the Center for Army Lessons Learned (CALL) web page in "CALL Products, Special Products" at http//call-army.mil.) This article also outlines procedures for wargaming an FA COA. These artillery-oriented modifications to the COA Analysis step of the MDMP help artillerymen wargame more thoroughly, thus leading to greater synchronization of FA operations. Although the matrix and wargaming procedures are the result of expertise in the 4th Battalion, 11th Field Artillery (4-11 FA), an M119 light howitzer battalion at Fort Wainwright in Alaska, they apply to all FA units.

Wargaming Process. According to *FM 101-5 Staff Operations and Organizations,* the fourth step of the MDMP is COA Analysis with wargaming the primary technique for the analyses. Wargaming allows the staff to visualize the operation at critical points to ensure all assets are synchronized to accomplish the mission and meet the commander's intent. Wargaming is essential to develop a synchronized COA; thus, the executive officer (XO) must allocate sufficient time to do a thorough wargame (at least one hour per COA).

A successful wargame depends on good preparation. (See Figure 1.) First, the operations NCO or plans officer gathers the products from the Mission Analysis and COA Development steps of the MDMP. They post the COA sketch, lists of specified and implied tasks, facts and critical assumptions, requests for information (RFIs) and assets available plus the synchronization matrix. In addition, they set up the planning cell with seats oriented to the COA sketch and the synchronization matrix so all posted materials can be seen easily.

As the plans area is being set up, the XO and S3 determine the critical events to wargame and COA selection criteria, if wargaming more than one COA. Choosing selection criteria before starting the wargame helps reduce biases in the COA comparison. The XO determines the wargame method based on the time available and scope of the operation. When the plans area is set up, the operations NCO assembles the staff.

Before wargaming, the S3 briefly reviews the COA for staff members not present during COA development and to refresh the staff's memory when working multiple COAs. Also, the S3 ensures a staff member is responsible for providing expertise on each BOS listed on the wargame synchronization matrix. The XO establishes the rules and sets the time limit. While the S3 runs the wargame, the XO supervises the process. If time is short, the S3 starts the wargaming process at the most critical event.

The plans officer posts the critical events at the top of the synchronization matrix. The friendly-action/enemy-reaction/friendly-counteraction drill is used for each critical event. The S2 plays a freethinking, aggressive enemy fighting the COA the commander requested in his guidance. The S3 introduces the critical event and the friendly action. The S2 then describes in detail the enemy reaction to the friendly action, focusing on how the reaction will impact the artillery battalion's units. The S3 discusses the friendly counteraction, again focusing on what the battalion's elements will do.

The FA wargame synchronization matrix drives the wargame and is used to record the results. The XO provides direction to the wargame by ensuring each component of the synchronization matrix is considered for each critical event and that all staff members actively participate in the wargame.

1. **Gather tools.**
   - Post sketch of the course of action (COA) to wargame.
   - Post map board with current graphics.
   - Prepare and post FA wargame synchronization matrix.
   - Post facts, assumptions and requests for information (RFI) lists.
   - Post specified and implied task lists and restated mission.
   - Post situation template (SITEMP) with time-phase lines to map board.
   - Set up areas to encourage participation.
   - Assemble participants.
2. **List friendly forces available: organic, attached or under operational control (OPCON).**
3. **List critical assumptions.**
   - List the assumptions necessary to continue planning.
   - Ensure all RFIs have been requested to limit the assumptions necessary.
4. **List critical events to wargame and decision points.**
5. **Determine evaluation criteria for COA:**
   - Commander's Intent and Guidance
   - Essential Field Artillery Tasks (EFATs)
   - Army Tenets
   - Principles of War
   - Supportability for Combat Service Support (CSS)
   - Flexibility
6. **Select wargaming approach:**
   - Belt (sequential belts wargamed working backwards from objective)
   - Avenue in Depth (good for offense operations)
   - Box (focuses on a critical event or decisive point)
   - Combination (used to cover a critical event or decisive point in greater detail)
7. **Select recording technique for results (synchronization matrix or narrative sketch).**
8. **Wargame the COA.**
   - Executive officer (XO) covers rules to encourage participation.
   - XO sets a time limit.
   - Process starts with the most critical event.
   - The friendly-action/enemy-action/friendly-counteraction drill is used.
   - Synchronization matrix provides direction for the wargame.
   - Plans officer records the results.
   - XO ensures everyone participates.
   - Wargame includes risk assessment.

Figure 1: Steps in the Wargaming Process

	Critical Event or Time	Setting the Defense
	Friendly Action	Move firing batteries and prepare defense.
	Enemy Action	Interdict MSRs, direct action against batteries and mortar and sniper attacks.
	Friendly Counteraction	Maneuver clears MSR prior to moves, establishes TCPs, requests radar coverage from Div Arty and digs in.
	Essential Fire Support Task(s)	Destroy enemy reconnaissance elements.
	Decision Points	
Intel	NAI	12 and 15
	TAI	
	Collection	Advance Parties
Essential FA Task(s)	Task	Destroy enemy reconnaissance.
	Purpose	Destroy enemy reconnaissance to allow unobserved movement of all Bde units.
	Method: • Priority	*Priority of Fires:* 2-1 INF, 1-17 INF, TF 1-10 *Priority of Targets:* A Btry AB7005, B Btry AB3015
	• Allocation	*Btry Tasks:* A- establish TCP, position and operate dummy radar, escort Blade TM to TOC, set up LZ for CLIV and V, collect NAI 15. B- protect radar, occupy with priority to radar, establish TCP, escort Blade TM to A, set up LZ for CLIV and V, collect NAI 12. *Move:* A Btry and deception radar SP221700Sept to PA 3 VQ919450 AOF 3000 B Btry and radar SP221400Sept to PA 4 VQ911450 AOF 3200 *Survey:* TM 1 move with A Btry TM 2 move with B Btry Priority: Radar, B, A, 2-1 Mort, 1-17 Mort *Radar:* Primary Search AZ - 3100, Alt AZ-1800 *Metro:* Sched: 221000, 222100, 23060Sept.
	• Restrictions	*Munitions:* Bde Cdr will clear use of illumination. *FSCM:* CFL is PL Blue.
	Effects	*Effect on Enemy:* All recon elements destroyed. *Location of Batteries at end of EFAT:* A Btry and deception radar in PA 3, AOF 3000 B Btry and radar in PA 4, AOF 3200
Support Operations	M/CM/S	Blade TM 2 OPCON to B 221500 to 222300Sept OPCON to A 222315 to 230900Sept OPCON to TOC 230930 to 231500Sept Priority to Survivability, CM- Priority of Spt: B, A, TOC
	NBC	
	ADA	Stinger TM 3 OPCON to B Btry 221800
	CSS (CLI(W), III, IV, V, Maint, Medic)	B: 6 A-22 bags of wire and pickets and 220 rounds of HE/RAP air delivery 221800Sep A: 4 A-22 bags of wire and pickets and 180 rounds of HE/RAP air delivery 221900Sep Ground LOGPAC on 231000Sep for CL I
	C^2	Spt Plt Ldr PZ control for CL IV&V
	Risk	Ambushes on MSRs; mortar attacks before defense is set
	External Coordination	Bde for maneuver force to clear MSR and Div Arty for radar coverage
	Notes and Planning Factors	

Legend:

ADA = Air Defense Artillery
AOF = Azimuth of Fire
AZ = Azimuth
Bde = Brigade
Btry = Battery
C^2 = Command and Control
Cdr = Commander
CFL = Coordinated Fire Line
CL = Class
CSS = Combat Service Support
Div Arty = Division Artillery
EFAT = Essential FA Task
EFSTs = Essential Fire Support Tasks
FSCM = Fire Support Coordination Measures
HE/RAP = High-Explosive/Rocket-Assisted Projectile
INF = Infantry
LOGPAC = Logistics Personnel and Administration Center
LZ = Landing Zone
M/CM/S = Mobility/Counter-mobility Survivability
Metro = Meteorological
Mort = Mortar
MSRs = Main Supply Routes
NAI = Named Area of Interest
NBC = Nuclear, Biological and Chemical
OPCON = Operational Control
PA = Position Area
PL = Phase Line
PZ = Pickup Zone
Spt Plt Ldr = Support Platoon Leader
TAI = Target Area of Interest
TCPs = Traffic Control Points
TF = Task Force
TM = Team
TOC = Tactical Operations Center

Figure 2: FA Wargame Synchronization Matrix

The 4-11 FA staff modified the standard BOS synchronization matrix to make it more useful in wargaming COA for artillery battalions, which has been revised slightly for compatibility with the terms used in the White Paper "Brigade and Below." This modified matrix is the FA wargame synchronization matrix (see Figure 2). It includes all the BOS on the standard matrix; however, it has merged maneuver and fire support into one section called "Essential Field Artillery Tasks" (EFATs)—that basically equates to FA operations. The sub-components of an EFAT are the task, purpose, method (priority of fires, priority targets, battery tasks, movement, survey, radar deployment, meteorological schedule, and munitions and fire support coordination measure restrictions) and effects. These are most of the elements necessary to synchronize an FA battalion's COA. The matrix is a tool to help ensure the battalion's assets are focused on each critical event.

The matrix also has a section for risk analysis to ensure the staff identifies high-risk hazards associated with critical events and assigns reduction measures to subordinate units or even modifies the COA, as necessary. Conducting the risk analysis up front saves time and effort. If the staff analyzes the risks after wargaming and decides to modify a COA to reduce the risks, it then must go back and wargame the changes made to that COA.

Our 4-11 FA staff blew up and mounted several copies of the matrix on poster board and laminated them as guides for the artillery COA wargaming process during its Joint Readiness Training Center (JRTC) rotations at Fort Polk, Louisiana.

The contents of the matrix in Figure 2 reflect the JRTC critical event of "setting up the defense." During this phase of the operation, both firing batteries and the radar are to move to new positions. The radar is to move and collocate with B Battery. The deception radar is to move and collocate with A Battery. The battalion has a engineer "Blade Team" to help the batteries dig in and prepare their defenses.

Each firing battery will move with a survey team to establish survey in the new primary and alternate positions. In addition, the support platoon will move Class IV and V by air to the new battery positions. The meteorological section will adjust its flight schedule during the firing battery moves.

- Synchronization Matrix
- Concept of the Operation and Coordinating Instructions
- Task to Subordinate Units
- Combat Service Support (CSS) Concept of Support
- Information to Develop Initial CSS Synchronization Matrix
- Initial Casualty Evacuation (CASEVAC) Plan
- Updated Operational and CSS Graphics
- Information to Produce the Decision Support Template (DST) or Matrix (DSM)
- Refined Reconnaissance and Surveillance (R&S) Plan
- Meteorological Support Plan
- Engineer Support Plan
- Air Defense Artillery (ADA) Support Plan
- Internal Fire Support Plan to Protect Batteries and Convoys
- Refined Commander's Critical Information Requirements (CCIR)
- Survey Plan
- Radar Deployment Order (RDO)
- Updated Requests for Information (RFI) List
- Contingency Operations to Consider
- Fourth Warning Order

Figure 3: Products of Wargaming

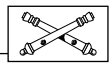
In reaction to the battery movements, the enemy will increase his interdiction of ground main supply routes (MSRs). He also will initiate more direct action by members of his Leesville Urban Group (LUG) and increase his Cortina Liberation Front (CLF) sniper and mortar attacks on the battery positions to disrupt their abilities to set up defenses.

The battalion's counteractions to the enemy's reactions are to ask brigade to provide a maneuver force to clear the MSRs before the firing batteries move, increase soldier alertness to civilians and civilian automobiles around battery areas or the convoys, establish traffic control points (TCPs) around battery positions, dig the batteries in with overhead cover and request radar coverage from division artillery (Div Arty) while the radar moves. As illustrated by this example, the FA wargame synchronization matrix clearly and succinctly prompts and captures all the functions an artillery battalion must perform to set the defense.

After wargaming a COA, the plans officer posts all external coordination requirements to the RFI list and assigns a staff agency to answer each RFI. If the staff has only one COA to wargame, then it begins preparing the FA support plan (FASP). If the staff must wargame other COAs, then it uses another FA wargame synchronization matrix and starts the process again. Figure 3 is a checklist of the products that are a result of each COA wargaming process.

If time is short, the commander outlines a single COA during mission analysis and the wargame may start with the most critical event to cover it in detail. The XO's supervision of the wargame led by the S3 allows him to use his expertise and raise questions, resolve issues and ensure proper procedures are followed.

The FA wargame synchronization matrix fills a gap in the Field Artillery community's tactics, techniques and procedures (TTP), providing procedures not addressed in official courses or publications. The intent is for the wargaming process to help the FA battalion fully synchronize it operations to execute the FA tasks essential for achieving the commander's intent.



Lieutenant Colonel Patrick J. Sweeney is the Executive Officer of the 101st Airborne Division (Air Assault) Artillery at Fort Campbell, Kentucky. In his previous assignment, he served as the Executive Officer of the 4th Battalion, 11th Field Artillery (4-11 FA) of the 1st Brigade of the 6th Infantry Division at Fort Wainwright, Alaska. Also in the 6th Infantry Division, he commanded A Battery and served as Plans Officer in the 5th Battalion, 11th Field Artillery. He holds master's degrees in Social Psychology from the University of North Carolina at Chapel Hill and in Military Art and Science from the Command and General Staff College at Fort Leavenworth, Kansas. **The author wishes to acknowledge the contributions of the commander and staff of 4-11 FA to the development of the FA Wargame Synchronization Matrix- in particular, Captain Kevin Grant, First Lieutenant Chad Brown and Major Thomas Powell.**

Army Values and Basic Training

Army values build the moral framework and define the ethical climate in our Army as an organization. They draw and bind us together as a professional team. They serve as a foundation for character and are the underlying strength for what we do or may be called to do.

Army training is designed to develop excellence in the military art. The seven Army values- *loyalty, duty, respect, selfless service, honor, integrity* and *personal courage*-are thread throughout that art and are inculcated in soldiers as they train in the profession of arms.

Scandals such as the one involving drill sergeants at Aberdeen Proving Ground, Maryland, several years ago made the Army take a long hard look at values in the Army as an institution. The result was a revitalization of our emphasis on values, values that have always been the foundation of our force. Part of that renewed emphasis is manifest in new soldier training-the "soldierization" process of turning a civilian into a soldier.

The Army targeted approximately $8.6 million to extend basic combat training (BCT) from eight to nine weeks to incorporate additional Army values training into every aspect of BCT. Effective October 1998, 54 hours of instruction were added to the standard BCT program of instruction (POI) to focus on Army values, Army and branch-specific heritage, and Army traditions. The addition of a week also allows more time for physical conditioning and developing teamwork and discipline. The new training is spread across BCT, not simply added as a week at the beginning or end.

Army Core Values—
The Foundation of Teamwork

FATC, Fort Sill, OK

Literally within minutes of arriving at a training battalion in the US Army Field Artillery Training Center (FATC) at Fort Sill, Oklahoma, the new soldier is introduced to the seven Army values by his drill sergeant. From that point forward, Army values are an overarching theme in BCT. His drill sergeant or a member of the FATC cadre relate how the Army's core values are relevant to the training at hand-basic rifle marksmanship, rifle bayonet training, first aid instruction, physical fitness training, etc.

For example, at Fort Sill, ranges and training facilities honor Medal of Honor (MOH) winners. When occupying a range or facility, each drill sergeant reads the MOH citation for the winner of the nation's highest award for valor and relates to the trainees the core values demonstrated by his actions.

In the BCT POI, soldiers learn the definitions of the seven Army values and how they impact behavior in their daily lives. The Training and Doctrine Command (TRADOC) developed training support materials (slides, video tapes, instructional vignettes, a cadre guide, the *Initial Entry Soldier's Handbook*, Army core values posters, etc.) for use in conducting the newly formalized values instruction. This instruction includes human relations training to help teach soldiers the value of respect for others and promote teamwork. Drill sergeants use these products for training and to conduct small group discussions about situations that call for demonstration of and adherence to the seven values.

New soldiers also learn how Army values impact their behavior in daily events. For example, drill sergeants point out it takes a certain amount of personal courage to hold a live hand grenade in one's chest and throw it and then throw another one to complete grenade training, a requirement for BCT graduation. Some soldiers show selfless service by volunteering to donate blood to the local blood bank or hospital.

Such training not only raises the soldier's knowledge and awareness of values and human relations, but also improves his overall behavior. When the drill sergeant conducts mandatory counseling at designated phases of the training, he reviews the soldier's performance in terms of Army values. For example, the drill sergeant discusses the soldier's participation in previous Army values small-group sessions and notes when he demonstrated (or did not demonstrate) one or more of the Army values in a situation or during a training event and reviews the consequences.

Army values are a way of life at the FATC. The cadre applies the *Be-Know-Do* philosophy to help new soldiers inculcate Army values. Every day and in front of every trainee, the FATC cadre must *Be* the role models who demonstrate the Army core values, must *Know* and articulate the standards for adherence to the Army core values and must *Do* what is right by the Army core values. Their example strengthens the instruction and provides tangible application of the Army values for new soldiers-who are our credentials.

LTC Michael A. Byrd
Commander, 1-79 FA (BCT/OSUT)
FA Training Center, Fort Sill, OK

Deliberate NFA Sizing for Combat

by Major Rodney L. Lusher

In a recent Battlefield Command Training Program (BCTP) Warfighter exercise, the number and size of tactical no fire areas (NFAs) inhibited fire supporters from delivering fires on a few high-payoff targets. Fire support observer/controllers at the National Training Center (NTC), Fort Irwin, California, observe that NFA management—the synchronized activation and deactivation of NFAs—is the most common reason for this problem; however, NFA management was not the primary cause at the Warfighter. Data collection for the after-action review (AAR) revealed the number of active NFAs was relatively accurate but that several were quite large and consumed significant portions of the battlefield. The AAR data begged the question regarding what exactly determines the size of an NFA. Regulations and field manuals reveal very little on the subject.

This article proposes a more deliberate methodology for computing a properly sized NFA in combat operations. It focuses particularly on the circular NFA fire supporters commonly place around collection assets positioned beyond the forward-line-of-troops (FLOT). I use risk estimate distances to verify the methodology ("Risk Estimate Distances for Indirect Fire in Combat" by Major Gerard Pokorski and Lonnie R. Minton, March-April 1997). Further, I assert that software enhancements to automated fire control devices are required for the most effective implementation of NFA sizing methodology.

The Challenge. The process used to formulate NFAs during the Warfighter had several problems. First, staff elements that coordinated the positioning of forward assets were also the ones that requested the NFA radius to protect them. Each element, however, had its own interpretation for the size of an NFA. The NFA file in the initial fire support automation system (IFSAS) displayed 250-, 500-, 600- and 2000-meter radii for like assets.

Second, some staff elements understood that a 2000-meter radius is always appropriate and requested it regardless of the asset size or its location. Conceivably, such an NFA could consume the entire width of a maneuver company commander's zone of attack.

Third, fire supporters inputted these sizes without considering their effect on the battlefield. At one point during the Warfighter, the fire support coordinator (FSCOORD) told the maneuver commander that the fire direction center (FDC) denied a fire mission based on violation of an NFA. The maneuver commander accepted that decision without question.

Fire supporters must strive to maintain the confidence of their commanders as this example illustrates, but they also must conduct an NFA "sanity check" to ensure that valid targeting areas are not unnecessarily consumed by excessive NFA radii. A more deliberate process for computing NFA size will better balance the two competing interests: protecting friendly assets and preserving valid targeting space.

FM 101-5-1 Operational Terms and Symbols defines an NFA as "an area in which no fires or effects of fires are allowed" and describes two exceptions: when approved by the establishing headquarters and in self-defense. The definition itself presents another problem. Fire Supporters and their fire direction devices do not comply with the doctrinal definition of an NFA (i.e., the effects of the fire). If a target location is one meter outside of an NFA, the battery computer system (BCS), fire direction system (FDS) and mortar ballistic computer (MBC) will recognize the target as valid, despite the fact that munition effects will enter the NFA. To account for the inconsistency between IFSAS and the definition, the fire support element (FSE) or FDC should expand the NFA radius to include munition effects before input. Fire supporters in the Warfighter exercise were not doing this.

Army doctrinal manuals define an NFA, its use and two exceptions, but they don't prescribe a methodology for determining the size. Moreover, the combat training centers (CTCs) do not teach a methodology for NFA sizing. The NTC, for example, applies values for specific artillery calibers to size NFAs. Most units, CTCs included, use standing operating procedures (SOP) or rule-of-thumb to determine size—but what drives those numbers and how precise are they?

The new Army Regulation (AR) 385-63 Range Safety is the only reference that prescribes numbers and procedures, but its contents primarily address safety computations for installation firing ranges. (See AR 385-63 at http://safety.army.mil.) The AR directs a safety buffer such as the one in Figure 1 that produces a 1:1,000,000 chance of a round impacting in an undesirable area. The AR states that the "provisions of this regulation/order are advisory for actual combat conditions" (the Preface to Paragraph 8b.).

The NTC derives minimum safe distances (MSD) from AR 385-63 and adds those distances to the NFAs to ensure munition effects do not enter the NFA. Though justified for peacetime training, one may argue that such safety buffers are excessive for combat.

The advanced Field Artillery tactical data system (AFATDS) software takes a forward stride toward having its NFA calculations comply with the doctrinal definition. AFATDS "Guidance" allows one to input a fire support buffer distance (FSBD) for six categories: FA cannon, FA rocket/missile, air, aviation, mortars and naval surface fire support. AFATDS adds the FSBD to the target size to determine if the expanded radius violates any restrictive graphic control measures. In basic terms, the FSBD is a single value that theoretically accounts for the effects radius, probable error (PE) and sheaf offset.

Though simple, this method is yet inadequate. The FSBD is a user-defined number and, therefore, largely based on an SOP or rule-of-thumb. While the FSBD is weapons category-specific, it does not consider the variations resulting from the munition fired, range-to-target or sheaf. These variables are significant and would provide a much more accurate "buffer distance." Currently, there are no requirements defined for such software enhancements.

Several factors confuse the NFA radius computation. The best example is deciding whether to use the bursting radius, the effects radius, the danger close distance or the fragmentation radius. Consider, for example, the 155-mm high-explosive (HE) round. It has a bursting radius of 50 meters, an effects radius of 150 meters, a danger close distance of 600 meters and a fragmentation distance of 725 meters. Which is the appropriate distance to use when sizing an NFA?

Another complication is deciding whether to plan for the most likely indirect fire weapon system a unit can employ or the most dangerous. If the multiple-launch rocket system (MLRS) or close air support (CAS) aircraft also are supporting the fight, does one use the MLRS effects radius, the 2000-pound bomb effects radius or the 155-mm effects radius? A brief reality check may help frame the solution.

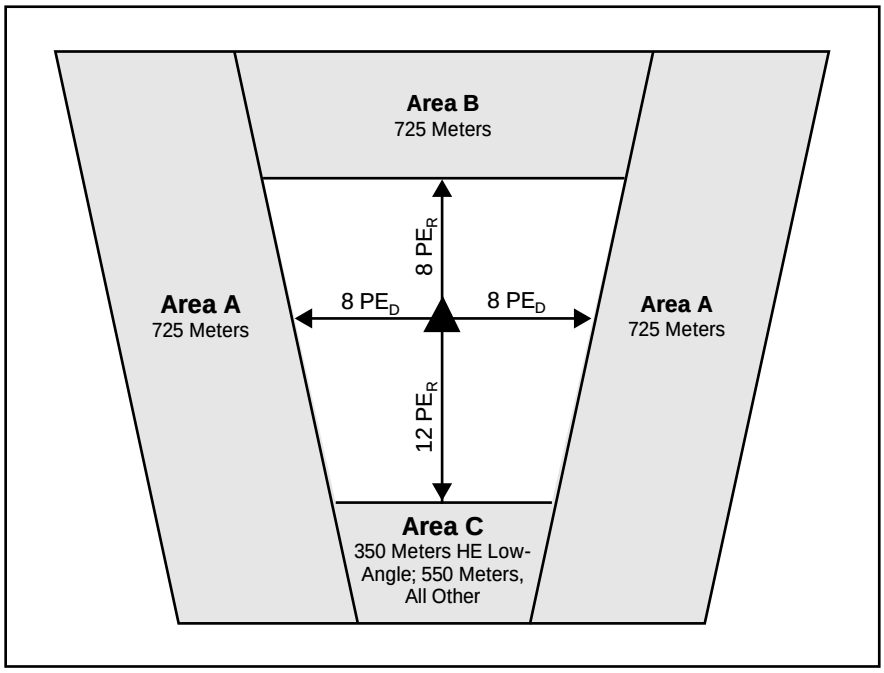


Figure 1: Army Regulation 385-63 Range Safety directs a safety buffer that produces a 1:1,000,000 chance of a round impacting in an undesirable area; the AR primarily addresses installation firing ranges. Probable error for both range (PE_R) and deflection (PE_D) are applied.

The fire supporter's reality check must consider the actual purpose for an NFA. What does it really do? An NFA is a secondary check that ensures friendly weapon systems do not inadvertently fire on another friendly asset (target identification is the primary check). The key word is "inadvertently."

NFAs prevent two primary cases of potential fratricide: first, when a friendly combat element detects a forward friendly asset and calls for fires and, second, when an observer mistakenly calls in his own location for fires. What radius do these two cases require?

If a friendly observer in an NFA consciously calls for close fires, then he probably needs them and will take the appropriate protective precautions. Again, the NFA radius must accommodate the balance between providing adequate protection for forward assets and preserving valid targeting areas.

Sizing Methodology. The NFA sizing methodology is a summation of four-variables that yields a properly sized radius for the vast majority of cases. The four variables are the freedom-of-movement space, the munition effects radius, the probable error and the sheaf offset. These variables will generate an NFA that protects forward assets *and* preserves valid targeting areas. Moreover, a deliberate methodology will standardize NFA computations.

The methodology assumes the firing unit meets the five elements of accurate predicted fires: target location and size, firing unit location, weapon and ammunition information, meteorological information and computational procedures (*FM 6-40 Field Artillery Manual Cannon Gunnery*, Page 1-3). Hereafter, I use the 155-mm HE munition to illustrate the methodology.

• *Variable #1—Freedom-of-Movement Area*. Each information, surveillance, target acquisition and reconnaissance (ISTAR) asset forward of the FLOT needs some space around the pinpoint grid in which to have freedom of movement. The freedom-of-movement radius provides the asset with space to disperse assets, conceal vehicles, establish a bivouac site and other actions. The area should be as small as possible but provide sufficient space to conduct activities, perhaps 50 to 100 meters. (See Step A in Figure 2.) The freedom-of-movement space should not include

room to reposition; repositioning requires a new center grid and freedom-of-movement radius.

• *Variable #2—Munition Effects Radius*. Every lethal munition has an effects radius, the maximum distance from point of impact that receives suppressive effects. While actual distances for suppressive effects vary based on target type and degree of protection, the effects distance provides a viable planning factor.

Several fire support field manuals in addition to FM 101-5-1 clearly state that an NFA precludes munition effects from the designated area. Consistent with that terminology, the NFA radius should use the munition effects radius rather than the bursting radius, danger close distance or fragmentation area. (See Step B in Figure 2.) But terminology alone is not an adequate criterion.

Risk estimate distances for combat provide a better test. Figure 3 on Page 44 shows the risk estimate distances for the 155-mm HE round. It is noteworthy that the bursting radius (50 meters), danger close distance (600 meters) and fragmentation distance (725 meters) plot outside the 10 to 0.1 percent probability of incapacity (PI) window—that is, 100 to 450 meters. (Probability of incapacity means each soldier requires evacuation from the battlefield.)

This suggests that 50 meters places friendly assets in imminent danger while 600 and 725 meters make an NFA unnecessarily large. The effects distance, on the other hand, lies within the PI window and is, therefore, the most appropriate.

• *Variable #3—Probable Error*. It is a basic gunnery reality that "should-hit" and "did-hit" data rarely match. Through the science of artillery ballistics one can account for many non-standard conditions that enables one to determine accurate firing data. However, despite the corrections, two rounds fired with the exact same set of conditions will not impact at the exact same point. This phenomenon is a result of inherent errors—errors for which one cannot account.

As an area fire weapon, fire supporters describe the elliptical dispersion pattern in terms of PE relative to the mean point of impact. Table G of the Tabular Firing Tables (TFT) outlines two types of PEs: range (PE_R) and deflection (PE_D). Statistically, if one extends three PEs from the mean point of impact in both range and deflection, one accounts for 96 percent of round-to-round disparity. The selection of three PEs (vice some other number of PEs) is a subjective decision based on acceptable risk to friendly troops—4 percent risk seems acceptable. The methodology, therefore, requires adding three PEs to the combined effects and freedom-of-movement radii (Step C in Figure 2).

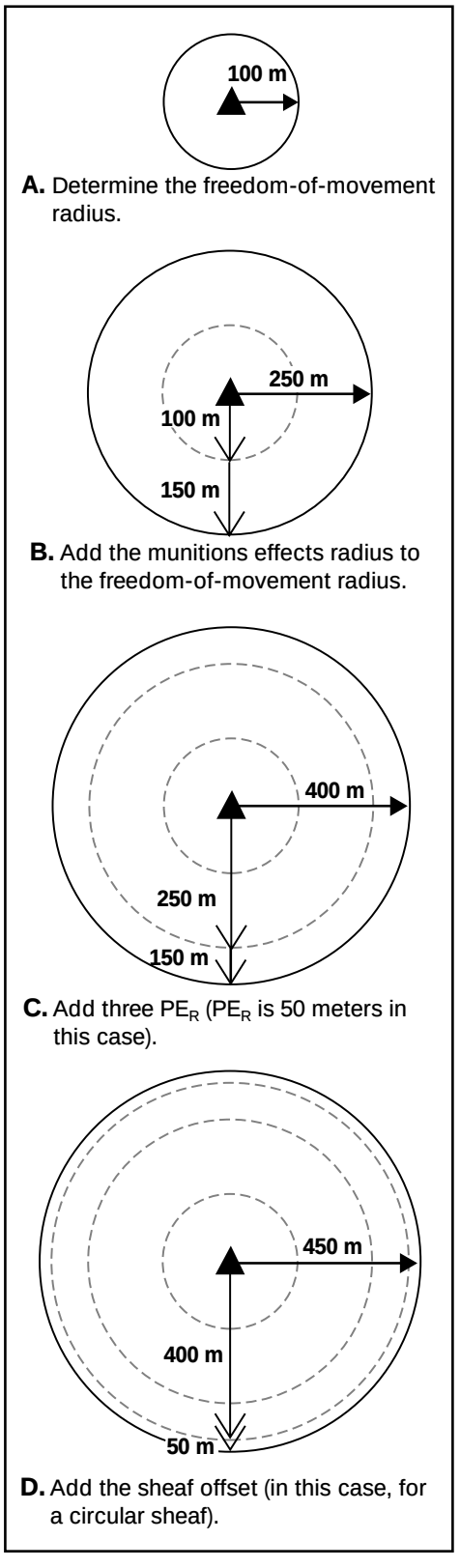


Figure 2: Factors for Deliberate NFA Sizing Methodology. The methodology standardizes NFA computations and factors in four variables: freedom-of-movement area; munition effects radius, probable error and sheaf offset. The methodology assumes the firing unit meets the five elements of accurate predicted fires.

Range PE is larger than deflection PE, except for rocket fires. For example, the PE_R for Charge 7W fired at low-angle and at max range is 34 meters while the deflection PE is only eight meters. Rocket fires are the opposite because PE_D is generally 1.75 times PE_R. For simplicity, manual NFA computations should employ the larger PE value for this variable: PE_D for rockets and PE_R for all others.

• *Variable #4—Sheaf Offset.* Tube artillery can fire five different types of sheafs: converged, linear, open, parallel and circular. Many units direct a standard firing sheaf in their SOPs. In combat, a circular sheaf is perhaps the most common standard.

All sheafs, except converged, require the NFA radius computations to account for the aimpoint offset from the actual target location. For example, the IFSAS circular sheaf algorithm for 155-mm rounds computes individual gun aimpoints 50 meters from the target location in a uniform radial pattern. The NFA computation must account for this sheaf offset by adding 50 meters to the NFA radius. The linear and open sheafs are somewhat more difficult based on their attitude (Figure 4 on Page 44) while the converged sheaf poses no additional computation because all guns fire at the same target location.

Using PE_D for rockets and PE_R for all others, the sum of these four variables generates a numerical value for the proper size of an NFA radius in the following formula: *NFA Radius = Freedom-of-Movement Radius + Munition Effects Radius + Three PEs + Sheaf Offset.*

Implementation. In the current system, staff proponents control collection assets and initiate NFAs; the system remains valid. However, the staff proponents should not recommend NFA sizing. Each should provide its FSE only the asset location and the freedom-of-movement radius. The staff proponent may vary the freedom-of-movement size based on the asset and mission, enemy, terrain, troops and time available (METT-T) but should keep the radius as small as possible (50 to 100 meters). Automated fire control devices within the fire support system should then compute the other three

				10% PI (Radius in Meters)			0.1% PI (Radius in Meters)		
Caliber	# of Guns	System	Shell/Fuze	1/3 System Range	2/3 System Range	Max Range	1/3 System Range	2/3 System Range	Max Range
155-mm	4	M109 M198	HE/PD or VT	100	100	125	200	280	450

Legend: **HE =** High Explosive **PD =** Point Detonating **PI =** Probability of Incapacity **VT=** Variable Time

Figure 3: Risk Estimate Distances for a 155-mm High Explosive (HE) Round. (This information was taken from the article " Risk Estimate Distances for Indirect Fire in Combat" written by Major Gerard Pokorski and Lonnie R. Minton, March-April 1997, Page 10.)

variables and sum the results to determine the final NFA radius.

The Quadripartite Standardization Agreement (QSTAG) 1139 (in press) advocates the inclusion of weapons effects in future artillery command and control information systems (C^2IS) software to prevent fratricide. While the call for enhanced automation to help prevent fratricide is certainly justified, QSTAG 1139, like doctrinal manuals, does not prescribe a methodology for determining NFA size. Accounting for only weapons effects ignores the key factors of PE and sheaf. A full solution must account for these variables.

Automation is the best solution for calculating NFA size because it can make the computations and comparisons on a mission-to-mission basis. This is important for three reasons. First, even within a particular weapon system such as the 155-mm howitzer, there is disparity in effects radii based on the munition fired. One dual-purpose improved conventional munition (DPICM) round has an effects pattern of approximately 100 x 120 meters at max range. The HE round has an effects radius of 150 meters regardless of range. New munitions like sense and destroy armor (SADARM) make this issue even more pronounced.

Second, there is variation in PE based on the range-to-target. PE_R increases with respect to the gun-to-target distance. Max PE_R occurs at max range fired at high angle.

Third, as illustrated in Figure 4, the attitude of the linear and open sheafs will affect the offset value. Automated fire control devices using electronic firing tables could quickly apply the appropriate munitions, PE and sheaf considerations to determine whether specific calls-for-fire violate an NFA.

Current fire control software lacks such tables/data and the computational algorithms; however, given such enhancements, fire supporters would input only the location and freedom-of-movement radius. Software algorithms then would calculate the other three variables and derive the final NFA radius (Figure 5). Appropriate software will negate the need for human computations and minimize human error. The Field Artillery needs to develop such software.

Each weapon system must define its own NFA size. Fire supporters must not allow an NFA tailored for MLRS (2000-meter radius) to inhibit the fires of every other indirect fire weapon system. Automated fire control devices provide the tools to meet this objective.

FDCs are the element best suited to make the weapon-specific computations. FDCs for cannon, rockets and mortars have the automated devices to compute the proper NFA size for their respective weapon system. Additionally, the FDC fire control devices have the data corresponding to the factors of range-to-target (PE), sheaf and munitions. This collection of data allows automated devices to quickly and accurately test whether the effects of fires will violate an NFA.

CAS is the only exception to NFA computational responsibilities. In this case, the FSE and tactical air control party (TACP) must work together to compute the NFA size for CAS sorties. The TACP members will have data on CAS munitions, and know what munitions the CAS sorties are carrying. The air liaison officer (ALO) or enlisted terminal attack controller (ETAC) directing the CAS strike will pass the NFA information to the pilots.

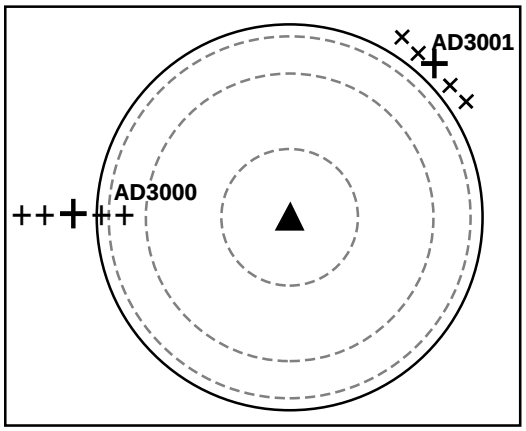


Figure 4: The attitude of the linear sheaf influences computation of the NFA size.

Because the software to make NFA calculations currently is not available, fire supporters must employ manual computations for the near-term. Though the manual procedure is not as precise as its automated equivalent, it is more deliberate and an improved solution to NFA sizing.

It is impractical for manual computations to occur on a mission-to-mission basis. Manual computations must be a one-time event that accounts for most firing orders (perhaps the standard fire order).

Look again at Figure 2 on Page 43. In Factor A, staff proponents deliver to the FSE their lists of forward assets with grid locations and the corresponding freedom-of-movement radii. The FSE derives the same information for its observers: combat observation lasing teams (COLTs), fire support team (FIST) and scouts. The FSE disseminates the lists to higher and lower headquarters and the firing units. Concurrently, the FSO and ALO compute CAS NFAs.

In Factor B, fire direction officers (FDOs) and mortar FDC chiefs add the effects radius/pattern for their weapon system using the munition in the standard fire order. For Factor C, FDOs and mortar FDC chiefs add three PEs and, for safety and speed, apply the PEs at the max range and high angle for the highest charge they will fire. For Factor D, FDOs and mortar FDC chiefs add the offset for the standard fire order sheaf.

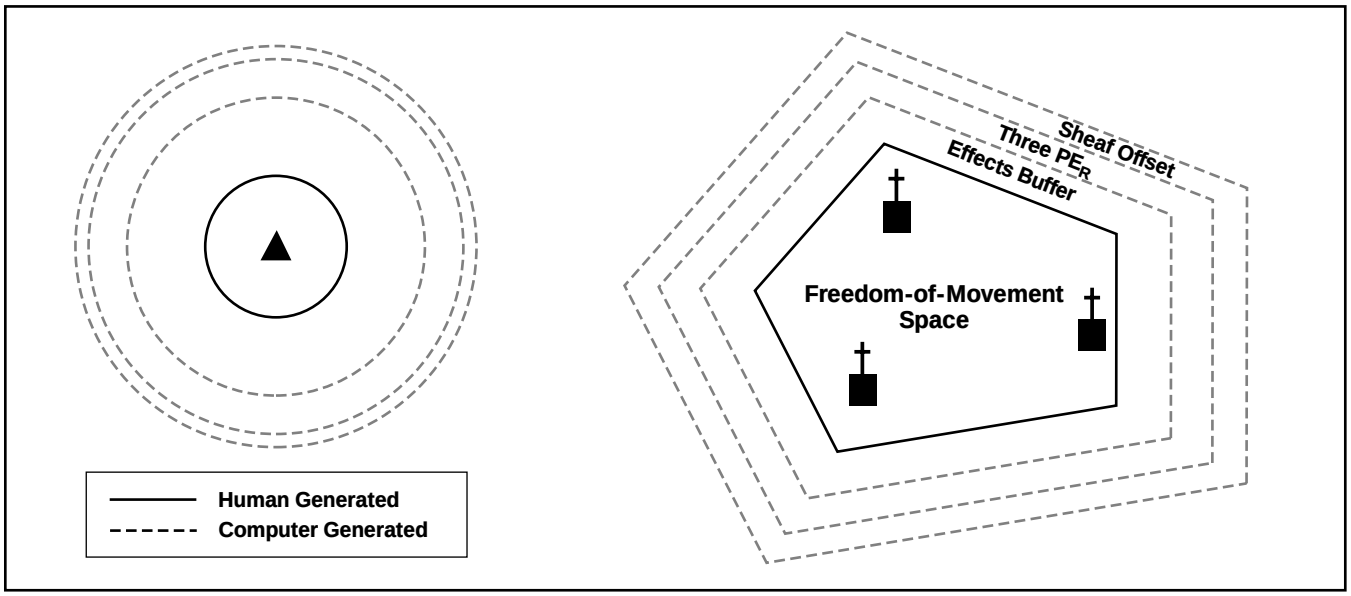


Figure 5: Examples of Automated Buffers for Both Round and Irregular Shaped NFAs. (PE_D is used for rockets and PE_R for all other rounds.)

Though the maximum values extend the NFA radius, the degree is not significant. For example, 155-mm HE fired in a circular sheaf at low angle with Charge 5W at a range of 8,000 meters generates an NFA radius of 328 meters (50 + 150 + 3(26) + 50). Using the manual procedure, meaning one must apply the max charge (7W—is used assuming that charge 8RB is not available) at max range (14,000 meters) and high angle generates an NFA radius of 364 meters (50 + 150 + 3(38) + 50).

The risk estimate distances in Figure 3 provide a good validity check. The numbers computed in the example fall clearly within the 0.1 to 10 percent PI window, suggesting a significant degree of validity for the NFA radius methodology. AR 385-63 safety buffer calculations for charge 7W generate a 1,029-meter NFA radius (8(38) + 725), which plots well in excess of the maximum 0.1 percent PI value.

The manual method does not account for all the "what-if" situations, but it's relatively simple and ensures an acceptable degree of protection for combat conditions, given risk estimate distances as a guide. When put to the reality check of how large an NFA radius must be to avoid the two primary cases of fratricide, the manual planning method as outlined is sufficient. If the computations do not remain simple, FDOs will likely disregard them and regress to rule-of-thumb.

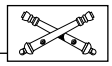
It is not necessary to redistribute the final NFA values for clearance of fires, although a battalion FDO may choose to consolidate platoon FDC computations as a secondary check. Brigade and task force (TF) FSEs have the list of NFAs but do not need to plot the exact radius—which weapon system radius would they plot if they chose to be exact?

In the case of FSEs, it is acceptable to plot an "about right" NFA radius. FSEs must continue to conduct a map spot of the target for potential fratricides. The level of fidelity need only alert FSE members to the delivery of fires in the vicinity of a friendly asset. This alert causes the FSE to monitor closely for denial of fires, inform the detecting element of friendly assets in the area (confirm target identification) or inform the forward asset of forthcoming close fires. The details of NFA restrictions reside appropriately at the firing unit, in particular, at the device or element computing the firing solution.

The sizing methodology is not limited to circular NFAs. It is not only feasible, but also recommended to apply the sizing methodology to irregularly shaped NFAs (Figure 5). Rather than use the computation to formulate a radius, one can apply the methodology to formulate a properly sized buffer around the protected area. Perhaps for hard, aboveground sites like national monuments or neutral sites, the FSCOORD may direct the fragmentation distance as the effects radius to ensure protection. Although the methodology in this article standardizes NFA sizing computations, it does not preclude a commander's overriding judgment when justified.

Army doctrine currently lacks a methodology for computing the size of NFAs. This gap in doctrine allows multiple interpretations and techniques that undermine standardization and adversely affect the battlefield. Those elements not familiar with the effect of large NFAs on the battlefield can unknowingly cause the denial of valid fire missions.

A deliberate NFA sizing methodology better balances the protection of forward assets while preserving valid targeting space. When the FSO looks to the commander and says a target violates an NFA, he must be sure that the asset is truly in danger from munition effects. A haphazard NFA radius does not provide that assurance. Fire supporters can do better by employing a deliberate process to NFA sizing.



Major Rodney L. Lusher is a Small Group Instructor for the Field Artillery Captain's Career Course at the Field Artillery School, Fort Sill, Oklahoma. Other assignments include serving as both Commander of B Battery, 3d Battalion, 1st Field Artillery and Fire Support Officer (FSO) for 2d Battalion, 70th Armor in the 3d Infantry Division (Mechanized), Germany. He also served as a firing Platoon Leader, company FSO and platoon Fire Direction Officer in the 2d Armored Division at Fort Hood, Texas. He is a recent graduate of the Command and General Staff College (CGSC) at Fort Leavenworth, Kansas, and holds Master of Science degrees in both Simulation and Engineering Management from the University of Central Florida.