

ARMOR



The American Roots of Blitzkrieg *See Page 7*



Saddle Up... Tonight We Ride

"They couldn't hit an elephant at this distance."

— General John Sedgwick (just before being killed by a sharpshooter at Spotsylvania Court House)

I lost a bet. Never would I imagine that anyone, much less MAJ Rex Awesome, could stay awake through an entire Army chain teach on "Consideration of Others." Awesome proved me wrong, though I'm certain he cheated through chemistry. So I again turn my column over to Awesome for one of his inspired tirades, my apologies in advance. — D2

Daigle, enough! During Army chain teaches and most PowerPoint briefings I prevent myself from lapsing into a coma by mulling over things that are just plain stupid. No doubt, readers are bored with your pandering and desperate for straight talk, so with that said, here are some just plain stupid things:

Off-site conferences. Most of you probably don't know what these are since you don't rate an invite (me neither). It seems many muckety-mucks figure that they can't have meetings on post in the usual locations — too many distractions. So they cut themselves, and in some cases their spouses, TDY orders so they can go off to a resort and have those important meetings. I'd love to know just how much money the Army spends on these boondoggles; betcha it's enough to buy a platoon of Crusaders or enough ammo to run a brigade through an annual gunnery.

Designated parking. I support designated parking for those who require special access, but drive around a post and tell me that this situation has not become ridiculous. Check it out, everybody has a designated parking slot, that is, except that mother of three small kids who has to park in Siberia so some retired O6 can park next to the commissary entrance. Why do we even have G.O. parking slots when they get dropped off all the time?

Deputy commanders. When and how did this stupid trend begin? Correct me if I'm wrong, and I'm not, but did we not

have commanders and executive officers in the old days and did that not work? There can only be one "old man" and, as I understand it, the commander is responsible for everything his unit does or fails to do, so where does a deputy commander come in? I'm at a loss here, folks! Whose ego are we trying to inflate with this bogus title? Call an XO an XO.

Long speeches. I hate these worse than blue laws. Why some people feel they need to bore the socks off an audience for longer than 10 minutes is beyond me.

Reactionary behavior. Somewhere, someone does something stupid, illegal, and embarrassing. The next thing ya' know, we're wearing values dog tags, carrying values cards, suffering through another chain teach, putting together sensitivity training, or creating a comic book. Here's a novel idea: when someone screws up, we hold them accountable and hammer 'em if need be. Please note that rank should not matter in the hammering; too many times senior officers are allowed to slip away quietly to retirement while we take that young E5 to the mat.

The yelling leadership style. I know there's a whole lotta leadership books out there and most discuss different leadership styles, but there are really only two types: leaders who react on the default mode of yelling, ranting, or raving and those who discriminate and lift off for select occasions. Most dismiss the screamers and their effectiveness is muted; however, I've seen the non-screamers send an audience into panic with a well-timed pause or hard look.

Some of you Poindexters might ping me for whining. Well this ain't whining, this is griping, and if you don't know the difference ask someone with kids to explain it to you. One thing I discovered from being miserable doing Army training is that if the team is griping about the bad chow or weather things are fine; it's when they are silent you had better worry.

— Rex, Out!

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November-December 2001, Vol. CX, No. 6

Features

- 7 **The American Roots of Blitzkrieg**
by Dr. George F. Hofmann
 - 13 **The Army Banks On Its Tanks** (Reprinted from *The Jerusalem Post*)
by Arie O'Sullivan
 - 14 **Fuel-Air Explosives Mature**
by Captain Douglas Huber
 - 16 **Improving LAV III Survivability**
by Stanley C. Crist
 - 18 **The Effectiveness of Artillery and the Maneuver Commander**
by Colonel Bruce B. G. Clarke (Retired)
 - 22 **Armored Cavalry Mortars: Operations and Myths**
by First Lieutenant John M. Ives
 - 27 **Do Armor Crewmen Need a More Effective Personal Defense Weapon?**
by Stanley C. Crist
 - 29 **Operation Weserübung: Inter-service Cooperation and Use of Combined Arms Led to German Success in Norway**
by Major Michael A. Boden
 - 33 **Rare Stuart Light Tank Discovered in Haiti Jungle Will Go to Army Museum in Europe**
 - 34 **Back to the Basics, Maintaining a Training Focus...**
by Captain Mike Henderson
 - 36 **Chasing the Mythical Commander's Week**
by Captain Chris L. Connolly
 - 39 **Breaking the Reconnaissance Code**
by Captain Eric B. Shaw
 - 41 **10 Division Armor/Cavalry Geographical Locations**
 - 42 **LISTING: Active Component Units**
 - 44 **LISTING: Marine Corps Tank Battalions**
 - 45 **LISTING: Army National Guard Units**
- Back Cover** **Stealth Recon Vehicle With "Melted Look" Is Introduced at Mideast Arms Show**

Departments

- | | | | |
|---|--------------------------|----|----------------------|
| 2 | Contacts | 6 | Driver's Seat |
| 3 | Letters | 50 | Reviews |
| 5 | Commander's Hatch | | |

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Tank Designer Christie Alienated the Russians, Too

Dear Sir:

To Dr. Charles M. Baily's recent and most interesting article in *ARMOR* regarding "Tank Myths," I would also like to add my years of frustrations over the ongoing confusion regarding J. Walter Christie and his tanks, especially with respect to his suspension system. A few additional comments, however, are warranted.

As noted, Christie was more interested in speed than armor and armament. I.A. Khalepskii, head of the Directorate for Mechanization and Motorization of the Red Army, made two trips to the United States. In April 1930, he witnessed Christie sign a contract for two tank chassis, which were shipped to the Soviet Union as farm tractors late in December. Khalepskii was only interested in Christie's helically-wound coil springs acting independently on each large road wheel because this system had the potential to meet operational mobility for the emerging doctrine of deep operations that require tanks with speed and maneuverability. At the time, this vehicle could move over rough ground at greater speeds than any tank then in existence. Under his direction, the BT (fast tank) series was developed and continued to be upgraded, which led to the famous T34.

Meanwhile, the Chief of Ordnance was not at all happy over Christie's duplicity and his flashy public tank demonstrations. While the Chief of Ordnance was trying to negotiate with Christie, the obstinate designer preferred instead to deal with Poland and the Soviet Union, a country not recognized by the United States. Furthermore, Christie's rigid insistence over the type of tank he thought was necessary for the U.S. Army made a suitable agreement nearly impossible. In June 1931 at one of the negotiations to purchase, Christie warned Ordnance officers responsible for procuring and testing tanks that he would bring to bear political pressures. At that heated meeting, he also stated he had spies in all Army branches that kept him posted on tank developments.

A year later, after the Army purchased seven Christies, the designer so threatened the Ordnance Department over their use of his patents that he was paid \$100,000 in 1920 for present and future use by the U.S. government. Christie claimed he and only he knew how to build tanks and would make trouble for any competing company. The stubborn Christie would not accept military requirements, disregarding the effect added weight of armor, armaments, and crew would have on the tank. By now, Ordnance was very disgusted and refused to further deal with the recalcitrant designer. Khalepskii also found Christie impossible. With two Christie chassis, Khalepskii had all he needed to exploit Christie's suspension system for a

massive tank program. By 1936, the Red Army had the largest tank fleet in the world.

In 1985, *Steel Steeds Christie* was published. Written by his son, J. Edward, the book was a sorry, self-serving memoir loaded with emotional bias that attempted to alter history. (See *ARMOR*, November-December 1986, page 3) Nevertheless, the book added to the Christie myth. A recent example also contributing to the Christie aura is Belton Cooper's *Death Traps*. (See page 21) Cooper was an Ordnance officer who served in the 3rd Armored Division during World War II. He called Christy (sic) a brilliant tank designer who developed the torsion bar suspension system. He chastised the U.S. military for a lack of interest. In fact, it was the Ordnance Department that developed the torsion bar suspension for Army tanks during World War II and retained this type of system until the termination of the M60 series. Cooper erroneously claimed that the helicoil system, rather than the volute-bogie suspension, was used in the M4s. How could an Ordnance officer with so much experience confuse tank suspension systems?

Why is basic research so difficult? How hard is it to determine that torsion bars installed horizontally across the tanks' underside would not compromise the vehicle dimensions, its width, and fighting space? This system was light and offered higher levels of performance. Whereas, Christie tanks employed side-mounted, long helical springs that compromised the hull space for the crew and fighting compartment. This arrangement became critical as tank turrets and armaments grew bigger. Understanding differences between tank suspensions is paramount when developing tactics and doctrine.

I totally agree with Dr. Baily that those interested in writing about armor history need to look at the wide-ranging primary sources, especially those dealing with J. Walter Christie, his tanks, and his relationship with the U.S. Army and the Ordnance Department. In addition, there are numerous articles, including those published in *ARMOR*, that offer the armor historian numerous references on the Christie subject.

Again, I wish to commend Dr. Baily on his excellent article.

GEORGE F. HOFMANN, PH.D.
History Professor
University of Cincinnati

Real Secrets at Kubinka Museum Were the Soviet Tank Prototypes

Dear Sir:

I read with interest the article by Jim Warford on the Kubinka armor museum in the

September-October 2001 issue. Having visited the facility several times, maybe I can clear up some of the mysteries. Although the museum became official in 1972, it in fact existed as a collection since the end of World War II. As in the case of the comparable U.S. facility, the Ordnance Museum at Aberdeen Proving Ground, the collection lost many of its exhibits over the years due to a lack of interest in preservation and many rare vehicles were scrapped. Its establishment as a formal museum in 1972 was in part an effort to stabilize the collection for training purposes.

The museum has not been as secret as the article would suggest. Its existence has been known among tank history specialists since the 1970s, and I published photos from the collection almost twenty years ago in some of my tank history books. What was secret was the collection's post-war Soviet armored vehicles. When I first visited the museum in 1991, I was not at all surprised by the vehicles in the foreign AFV halls, having already seen photos of most of them. What was so thrilling was to see the many unknown Soviet developmental vehicles that had previously never been revealed.

One of the statements in the article is not correct. There are not 290 foreign AFVs in the collection. There are (approximately) 290 AFVs in the collection including the foreign examples. Of the seven display halls, Hall 5 covers British and U.S. AFVs, Hall 6 covers World War II German AFVs, and Hall 7 covers other foreign AFVs. The other four halls are devoted to Soviet designs.

The reason for the relative lack of photos of the American vehicles is due in part to the difficulty of photographing the collection. The museum is located on a closed military base, and access is difficult. Efforts to build a public access road to avoid this problem have faltered due to a lack of funding. Visits to the museum are at the whim of the curator and/or base commander. Even after being granted access, the use of cameras is nearly always restricted to some extent or another. On one occasion, I was allowed to use my camera for thirty minutes; on another occasion, about an hour; sometimes no cameras are allowed. Even when permission to use cameras is given, it is technically difficult to take good photos due to the lighting conditions in the hall.

Under these difficult circumstances I can assure you, that given the choice to photograph an M113 or an unknown Soviet prototype tank, I chose the latter. Most of the U.S. vehicles in the collection are well known types from World War II Lend Lease sources, and the post-war U.S. AFVs are very few in number and relatively well known among tank history specialists. Indeed, the

Russian armor history magazine, *Tankmaster*, has been running a series of articles on the foreign tanks in the collection, based on archival material from the Soviet trials of the vehicles at Kubinka. For readers interested in seeing photos of the U.S. vehicles in the collection, they were included in the published Russian catalog of the collection, and in the book by Michael Cecil, *Kubinka: The Russian Museum of Armoured Vehicles*, published in Australia in 1992.

Nearly all of the post-war U.S. vehicles came from vehicles captured in Korea or Vietnam. The reason for the lingering mystery about remaining American vehicles has more to do with a lack of interest than due to any secrecy. Try finding out where some of the Soviet vehicles in U.S. collections originated! It's the same problem. The museum is handed a vehicle from the technical exploitation office with no data on its origin, and soon myths and legends encrust the real story. An example is the M41 light tank at Kubinka. Some Russians state it is an ARVN vehicle from Vietnam, while others say that it is one of the Bay of Pigs tanks. I have photos of many of the U.S. vehicles at Kubinka but haven't bothered to publish them as no one has ever shown much interest.

Regarding the mystery halls at Kubinka, there is really not much mystery about them. Hall 8 is an empty demonstration hall, and the exhibits there vary. It is sometimes closed off to foreigners as it is occasionally used to put on displays of new Russian equipment for visiting dignitaries. The last time I was in it, there was a display of vehicles that were being offered for export for visiting foreign delegations in the Moscow area. Hall 9 is a work area and shelter for incomplete vehicles, and access is usually not allowed as the hall is usually a mess. For anyone interested in its contents, a good selection of photos is available in Fraser Gray's book, *Secret Kubinka*, published in the U.K. in 1998. One location not mentioned in Jim Warford's article is the "elephant's graveyard" at Kubinka. This is simply an open field where several dozen tanks are dumped. This includes a number of unique Soviet-era tank prototypes. Access to this area is generally restricted if only for shame at the poor state of the vehicles. The Russians have great pride in their tank history and like to show it in the best light, not as a field of rusting hulks.

The real secret museums in Russia are the design bureau museums. The Uralvagonzavod plant in Nizhni Tagil has one, as does the other surviving plant at Omsk. I have seen TV footage inside the Nizhni Tagil museum, but it is generally off limits to foreigners except to some customers of Russian defense products.

For readers traveling to Russia who want to visit the Kubinka museum, some travel agents in Moscow can arrange a trip, but access is very erratic. Nevertheless, there

are interesting AFV exhibits at the Central Armed Forces Museum in Moscow, the Artillery and Engineer Museum in St. Petersburg, and the Poklonna Gora Memorial museum on the outskirts of Moscow, to say nothing of the many regional museums. An invaluable guide for tank buffs traveling around Russia is Trevor Larkum's and Jim Kinnear's *Preserved Tanks in Russia* published in the U.K. in 1997, which lists nearly 600 preserved AFVs and their location, including all of the known Kubinka exhibits.

STEVE ZALOGA

Scout Leader Seeks Help On 40mm Grenade Training

Dear Sir:

I am a scout platoon leader and found the article on light cavalry gunnery very interesting. I recently tried to implement a full light cavalry gunnery program to include Tables I-X. Due to STRAC we were not allocated the full amount of 40mm ammunition; we had to pull an IRF trump card to get it. We proceeded with the tables, all to standard, and came to the conclusion that the MK 19 tables were unrealistic. We had a normal train-up to gunnery, including SGST. The tables do not seem to reflect time of flight and are very short on time. They consider the MK 19 a point weapon when it should be an area weapon. If this is the case, we should get the ammo to do this correctly. A nasty rumor circulating in my unit and others says that several Bradley master gunners were rounded up, put on TDY, and given a week to come up with these tables.

My only question is, is anyone experiencing these difficulties? If they are, what are their solutions? I qualified all five 50 cal. trucks first run and only 1 MK 19 truck first run. Has anyone done this or anything similar? I am only able to use *FM 17-12-8* as a guideline. Please help.

1LT JAMES FUNKHOUSER
Scout Platoon Leader, 2-63 AR

There's No Substitute For a Live Fire TTVIII

Dear Sir:

I wish to comment on Dr. Hagman's proposal for reduced TTVIII based upon projected qualifications after as few as two engagements. I am not sure it is a tool we need. The basis of my training philosophy is the belief that if all else fails, 14 well-trained, lethal crews will be able to achieve the majority of missions given to them. A full TTVIII is critical to training lethal crews for several reasons.

First, it requires the crew to demonstrate several competencies that are not ade-

quately tested in virtual training. For example, there is no adequate virtual trainer for the .50 caliber machine gun. A reduced gunnery of only two engagements would not verify that the crew possesses the important tasks/habits of correctly boresighting before the day and night runs, or that they conduct MRS updates as needed. TTVIII tests the entire crew, not just the TC and gunner; a slow loader or a jerky driver do not exist in the virtual world. The mix of target arrays and conditions represented in TTVIII is therefore a very important reason — we need to evaluate crews under all of those conditions, not just the first few!

Second, for those of us who will go to war on our training equipment, TTVIII is the best means of building crew confidence. I dare anyone to deny the importance of soldier confidence. I wager that those who do will not be the ones on the battle position when the bullets start flying.

Most importantly, TTVIII is an important part of a tank crew's psychology. I believe that the title of "Top Gun" is the BEST way of building esprit. Nothing else, not APFT scores, not DUI-free days, not maneuver victories over sister units, will build unit pride faster than a successful gunnery. This goes far beyond mere bragging rights. You can't fool soldiers. They intuitively know that a successful TTVIII run is the best means of measuring proficiency in the fundamental task of a tank unit, *killing the enemy under a variety of conditions*. Any modification to TTVIII other than making it more difficult and realistic will have disastrous effects upon morale.

Training individual crews to hit and kill the enemy is our most important task and it cannot be done adequately with simulation alone. If we divert resources to other collective tasks from TTVIII we are undermining the basis for victory with misguided priorities. Dr. Hagman's ideas have merit and could be applied in other areas. Under resource constraints they might be applied to TTVII with some modifications. I think under extreme time constraints they might have a place in TTVIII. It is more likely that they would be useful to mechanized infantry or cavalry units when vehicle lethality is not the paramount skill to be trained.

I do not mean to say that TTXII, other forms of live-fire exercise, or force-on-force maneuver training are not important. Like crew gunnery, they cannot be adequately trained without actual field time; however, the basis of all these training events is a lethal crew with confidence in themselves and their equipment. In short, the basis for what we do is TTVIII. If forced to divert resources, I would take from these other events to ensure a quality TTVIII — never the other way around.

J.P. CLARK
CPT, Armor
D/2-72 AR

Major General R. Steven Whitcomb
Commanding General
U.S. Army Armor Center



Steady in the Saddle

Just like most of you, I watched the events of 11 September 2001 unfold in shock and disbelief. The sheer scope and devastation of the attack is difficult to fathom and impossible to understand. The Nation, the Army, and the Mounted Force have dealt with the initial shock and bereavement. We are now left trying to determine the effects and our reaction to these acts. Two overwhelming questions being asked are, "What impact does this threat have on the Mounted Force?" and "How will we contribute to the war on terrorism?" While I don't know the full answers to these questions, I can offer a few ideas.

Steady in the Saddle

There are three thoughts that we must remember as we search for our role in combating terrorism. First, our mission remains unchanged: we exist to fight our Nation's enemies on the field of battle and to destroy them in close combat. Second, the Nation looks to us to maintain that capability and they draw comfort in knowing we are the best in the world at close combat. Third, just like our missions in Somalia, Bosnia, or Macedonia, we may be called upon to execute some missions that stray from close combat. Regardless, our ability to execute those missions successfully springs from our competence at our primary task. The skills that enable a combat team to be successful at peacekeeping or humanitarian assistance are derived from being ready for combat. As we develop the tactics, techniques, and procedures for homeland defense, those Armor and Cavalry soldiers in the National Guard will assume some additional tasks based on their relationship to their

home states. But, their ability to successfully execute these missions will flow from their training for war. All Armor and Cavalry leaders need to remain steady in the saddle and continue to train your soldiers for war. Soldiers naturally emulate leaders who remain calm and focused on the mission at hand while developing the appropriate measures for dealing with any new threat.

Realize There Is a New Threat

Staying steady in the saddle doesn't mean that there aren't some changes that the entire force will have to adopt in order to stay current with this new threat. We at Fort Knox are dusting off the lessons on OPSEC and COMSEC. I recommend that all leaders do this. Computers have become more prominent in all of our organizations and are accessible to everyone. We need to relook some of our Cold War security procedures and update them for the new operational environment. While we have always focused on force protection during deployments, we have not been as attentive to force protection at home station.

For the foreseeable future, we will have to maintain vigilance over our soldiers and train them to watch out for themselves. Our enemy has the advantage of faceless anonymity. He is content to lurk in the shadows as he patiently gathers information on our vulnerabilities. He has clearly proven that he makes no discrimination between soldiers and civilians, so we will have to educate not only our soldiers but also our families on situational awareness, force protection, and risk avoidance. Remember, the enemy is willing to

wait until we grow complacent before he strikes. Leaders at all levels will now have to fight to prevent their soldiers from becoming too comfortable or complacent on OPSEC, COMSEC, and force protection.

Challenge Old Ideas To Better Meet a New Threat

Our training, leading, and fighting methods will have to change. The senior leaders in the Army realized this a couple of years ago and set in motion the Transformation effort. On 11 September, I was on my way to the third iteration in a series of TRADOC wargames dealing with transforming our doctrine, training, and leading. The terrorist attack underscored the importance of our efforts and the need to transform our Army. It also reinforced my realization that it will not be leaders of my grade and experience that will bring about the changes necessary to move our Army into the future. The senior leaders of the Army will set the conditions for change and improvement, but it will be the sergeants, lieutenants, and captains of the Mounted Force that will develop the procedures that will enable the Objective Force.

An inventive, modern-day enemy will have to be met and defeated by an inventive, adaptive, future-oriented leader. We have plenty of those leaders in our ranks and I want to hear from them. I want you to provide your ideas and methods to *ARMOR* Magazine. I want to have discussions and maybe a few arguments on how to transform the Armor Force into the Objective Force of tomorrow.

Continued on Page 6

Laptops Are Replacing Paper In Armor Center Training Courses

CSM Carl E. Christian, Command Sergeant Major, U.S. Army Armor Center

The switch from paper course materials to laptop computers is continuing at the Armor Center, offering big advantages to both students and course administrators. For over a year, the Noncommissioned Officers Academy has been issuing laptops to all students attending the 19 Delta and 19 Kilo Advanced Noncommissioned Officer Courses (ANCOC) Phase I & II, and more courses may soon make this change-over.

Until September 2000, students beginning their attendance at ANCOC were issued piles of paper text materials. They had to lug these texts to and from classes on a daily basis, the Academy had to maintain and account for all of them, and the format made it difficult to rapidly adapt to changes to Army doctrine. In addition, there was the astronomical cost of printing and reprinting text materials and the students' difficulty in acquiring up-to-date references. Finally, we realized the growing need to train soldiers closer to their home stations, and this last point may

be the most important in the days to come.

The laptops are pre-loaded with all needed reference materials, including Army regulations, field manuals, technical manuals, and DA pamphlets, as well as student handouts and practical exercises, making it unnecessary to issue any paper copies of assignments. The laptops are also loaded with *TACOPS* (a tactical game which allows students to train and retrain tactical exercises individually or in unit-size groups).

By using the laptop computers, students also gain the opportunity to build on their computer skills, a growing requirement in all our future systems. ANCOC students have full access to the Internet while connected to a local area network (LAN) in the classroom. Cadre closely monitor the performance of students to ensure there is no degradation in their performance, and step in to lend assistance when needed. To date, the program has been overwhelmingly successful. So far, the NCO Academy



has received great reviews from all students attending ANCOC. Our plan is to build upon this success by linking the computers in the classrooms, allowing students to interact and conduct tactical training on a program such as a virtual sand table.

The proven success of laptop computers in ANCOC has triggered a campaign in the Armor Center to place laptops in the Basic Noncommissioned Officer Course and to begin research into placing them in the Primary Leadership Development Course (PLDC).

The world is changing, but so is the process we use to get leaders prepared to do their jobs. The Armor Center is committed to provide the force with trained and prepared soldiers and leaders. We remain ready to serve and support the force because, "Today is the best day to be a soldier!"

Commander's Hatch from Page 5

I'm encouraging the publication of pieces like "Chasing the Mythical Commander's Week" that appears in this publication. CPT Connolly identifies a training problem and offers some innovative and probably controversial methods for solving these problems. CSM DePriest and COL Anderson analyzed the complex issue of how to use a Command Sergeant Major in "Redefining the Role of the Command Sergeant Major in a Tactical Environment" in the March-April 2001 issue. These articles and the discussions they trigger are the keys to making Transformation

a reality. Leaders at the battalion and brigade level must encourage their innovative leaders to capture their thoughts and share them with our professional journal. We need the intellectual energy of our junior leaders to meet the challenges that their generation and successive generations will face.

The Future

At the time I am writing this article, I have no idea of what actions the National Command Authority will choose to pursue. Regardless of the decisions made, I know that the Mechanized For-

ces are preparing to act and carry out those decisions with lethal results. We are in this war for the long haul and I know that Armor and Cavalry soldiers have a role to play in this conflict and in the future. Here at Fort Knox, we will continue to do our best to provide quality training and leadership development for the entire mounted force. I know that each of you will continue to demonstrate the steady competence that has become the hallmark of our force.

FORGE THE THUNDERBOLT
AND STRIKE FIRST!!

The American Roots of Blitzkrieg

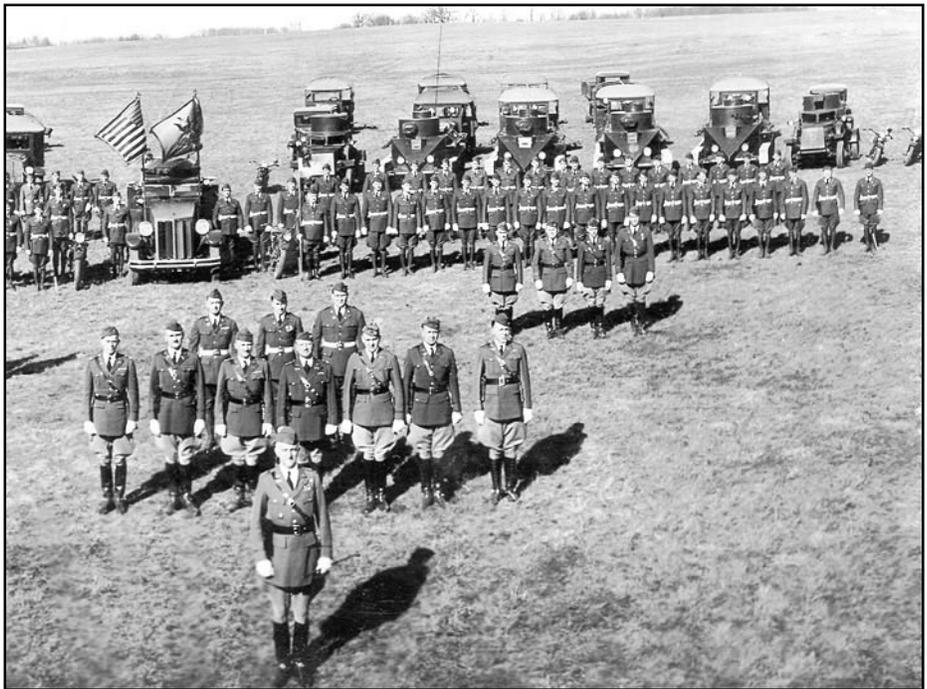
What the Germans Learned in Visits to Fort Knox Before World War II Broke Out in Europe

by Dr. George F. Hofmann

During the early 1930s, long before Germany's panzer divisions rolled into Poland and introduced the world to *blitzkrieg*, or lightning war, the German Army had been studying how other nations were approaching mechanization, the employment of tanks, and the theoretical promise of maneuver warfare.

In developing their doctrine, Reichswehr and Wehrmacht staff officers visited other nations that were wrestling with these same problems, including England, France, the Soviet Union, and the United States. These intelligence-gathering missions brought them to Fort Knox, Fort Benning, Fort Eustis, and Fort Meade where they observed how the American Army was applying the potential of the internal combustion engine to future warfare.

In the fall of 1930, as Major Heinz Guderian was working on the problem of troop motorization at the German Defense Ministry, one of his colleagues, Captain Adolf von Schell, was attending the Infantry School's advanced course at Fort Benning. As a student, von Schell materially contributed to the school by sharing his experiences in World War I.¹ In addition, he was very adept at discussing modern concepts of mobile warfare, then a major area of investigation for the German Army. Exploring these interests, von Schell requested a two-week attachment to the U.S. Tank School, then at Fort Meade, where he wanted to observe the 34th Infantry (Motorized). This unit had detached a machine gun company to Fort Eustis, Virginia, to join the Mechanized Force, an experiment that lasted only about a year. Although von Schell's visit was approved, it was later cancelled because the 34th



Colonel Van Voorhis, foreground, stands in formation with his troops at Fort Knox in the 1930s. Note the wide range of equipment, including tanks and armored cars, as America attempted to forge its first mechanized force.

Infantry was in the process of changing station.

The Mechanized Force was experimental in the sense that it was composed of combined arms capable of independent operations as a mobile force that went far beyond traditional infantry and cavalry formations. This futuristic vision, similar to a British experiment in the late 1920s, was short-lived. The experiment ended in the fall of 1931, partly a casualty of inter-branch rivalry, partly a casualty of the Depression that had gripped the nation. The vision was deferred until July 1940, when the combined arms Armored Force was created over the objections of the chiefs of the Infantry

and Cavalry branches. In the meantime, each branch was directed to pursue mechanization on its own.

Following this guidance later in the 1930s, the Cavalry branch created a mechanized force at Fort Knox, which also drew German interest and led to additional staff visits. Colonel Daniel Van Voorhis, the commander of the 1st Cavalry (Mechanized) and his S3, Major Robert W. Grow, recalled German visits to Fort Knox in 1933, including one by a Major Phillips, a German general staff officer. Phillips, an ordnance tank expert, expressed ideas on mechanization that agreed with the developments at Fort Knox, where Colonel Van Voorhis was developing a self-



Captain Adolf von Schell, far left, visited Fort Knox to observe the U.S. approach to mechanization as his superior, General Heinz Guderian, at left, planned Germany's mechanized force.

Leading the U.S. effort at the time was Colonel Daniel Van Voorhis, at right, who was testing new weapons and new theories of mobile warfare at the Kentucky post.



contained mobile force capable of deep operations and fighting mounted. A few months later, Major Phillips was back at Knox, this time with Major Hans von Greiffenberg, another general staff officer. The visitors took rides in the 1st Cavalry's armored cars, observed demonstrations of new radio equipment, and after hours, retired to the Doe Run Inn for dinner and discussions with their hosts.

Colonel Van Voorhis recalled that the Germans were not particularly interested in the Americans' equipment, but on their views about the proper tactical and strategic employment of mechanized forces. Major Grow, who accompanied Van Voorhis, agreed, and added that the thinking at Fort Knox regarding the employment of self-contained units was ahead of the Germans. It was Grow's opinion, however, that the German Army was more advanced in the development of vehicular equipment. In addition, Grow wrote in his diary that the German military was "going all out in anticipation of a European war."²

At the time of the Germans' visit, the 1st Cavalry (Mechanized) included the Armored Car Troop for long distance reconnaissance; the Scout Troop for close-in reconnaissance and security; the assaulting or striking squadron of combat cars; and their holding unit, the Machine Gun Troop. Communications were carried out largely by a simple code system over voice radio supplemented by motorcycles, automobiles, and hand signals.³

The following year, at the beginning of the important Fort Riley maneuvers in spring 1934, the 1st Cavalry (Mechanized) commanded by Colonel Adna R. Chaffee, Jr., demonstrated its operational mobility by traveling overland from Fort Knox. The maneuvers were designed to determine how far the cavalry had progressed with mechanization, motorization, and new weapons

development for deep operations with a self-contained force.

Before the maneuvers, Army Ordnance developed a new combat car for the mechanized Cavalry, the 9.5-ton convertible Combat Car T4. The design was based on the Christie Combat Car T1. By mid 1932, four CCT1s had arrived at Fort Knox and became the nucleus for the striking squadron. Like the CCT1, the CCT4 employed the convertible wheel-and-track and helical spring suspension system, and was briefly tested at Fort Knox before the Fort Riley maneuvers. The test committee recommended the vehicle, with modifications, be declared standard. It was a decision Chaffee strongly supported based on his earlier experience observing the Christie tank acceptance tests and comparing those with the CCT4's operational mobility and speed.

During service tests following the maneuvers, the CCT4 outperformed the Ordnance-designed 7-ton CCT5, which displayed a double "Mae West" turret and a new rigid suspension system. The CCT5 was a radical departure from the Christie design. The vehicle was full tracked and non-convertible, employing a volute spring or bogey suspension system with a divided power train. During the tests, the Christie type suspension system provided a more stable gun platform with better ditch-crossing capabilities, while the Ordnance-designed vehicle was more maneuverable but so choppy in cross-country performance that accurate marching fire was impossible.⁴ Understandably, observers at Fort Riley did not favorably view the "Mae West" profile.⁵

At year's end, Chaffee was overruled. The decision was made to acquire a modified CCT5 (minus the "Mae West") for the cavalry. Generally, combat car proponents at user level favored the CCT4. At the staff level, however, the War Department favored the 7-ton weight and lower cost of the CCT5,

thus taking advantage of the opportunity to produce a less expensive vehicle manufactured at Rock Island Arsenal. In addition, the CCT5 avoided the engineering dilemma imposed by the wheel-track convertible design. Captain H.H.D. Heiberg, who served with the mechanized cavalry since 1932, recalled that the decision to adopt the CCT5 was made in the War Department "by officers [who had] probably never ridden in a tank, much less fired from one."⁶ More so, the decision was driven by a War Department directive to impose a weight limit of seven tons. The CCT5 was standardized for production as the Combat Car M1. The vehicle reflected certain features, such as the Ordnance-designed volute suspension system, which remained characteristic of all U.S. tanks until late in World War II.⁷

In November 1936, a reported German tank expert wrote in the military weekly, *Militar Wochenblatt*, that in spite of its high speed, the CCT5 was a "perfect example of bad construction." The Americans had repeated all the mistakes European tank and armored car builders had made, he noted. Furthermore, American tank armor was too light to resist modern weapons.⁸ Heinz Guderian, who was emerging as a key German practitioner of armored warfare, noted that the Christie tank developed by the Red Army since the early 1930s was also too light; however, it was a well-designed and tested machine with great speed.⁹

The War Department, however, defended its mechanized equipment, claiming it compared favorably with that of any nation.¹⁰

(The German observation soon proved correct. When U.S. Army tanks were first employed in Tunisia in February 1943, they lacked sufficient armor and armaments to engage German tanks. This disparity was never corrected until

THE MACHINES: 1930s State of the Art



Above, the Ordnance-sponsored T5 Combat Car descends a slope during testing. Its vertical volute spring suspension was later a common feature of U.S. light and medium tanks, but the idea of twin turrets was abandoned for tactical reasons.

The first German efforts, like this Pzkw I destroyed by a field gun in Poland, at right, also proved to be too light for combat and were soon relegated to scouting and command missions. The Pzkw I was also limited to machine gun armament.



Above, the unusual Christie convertible wheel/track suspension is seen in the wheeled configuration with its tracks stowed above and below the fenders on each side. Called “combat cars” (the cavalry was prohibited from owning “tanks”), the T4 was armed with machine guns.



after the Battle of the Bulge, according to General Omar N. Bradley, the commander of the Twelfth Army Group during its assault on Fortress Europe.)¹¹

Meanwhile, the Wehrmacht’s interest in military developments in the U.S. continued. Writing in the *Militär Wissenschaftliche Rundschau* in January 1936, Colonel Guderian — now considered by the U.S. Army attaché in Berlin as one of the foremost experts on motorization and tanks — noted that the United States occupied the first position among all countries in the world regarding the technical production of its automobiles. Its army, however, has not yet participated in this economic development, he wrote. Guderian criticized the U.S. Army for not giving special attention to Christie tanks, which were given their greatest fulfillment in the Red Army rather than the country of their origin. He was also critical of the autonomy of the U.S. Army branch system that gave control of tanks to the infantry and the cavalry reference of tanks as combat cars. Concluding, he noted that a consolidated authority was lacking.¹²

In November, Guderian published another article in the *Militär Wissenschaftliche Rundschau*, which reflected his strong interest in mechanized warfare as expressed in the United States, England, France, and the Soviet Union. This article represented the official doctrine regarding the employment of tanks in mechanized warfare. He emphasized that the striking power of armored troops must rely on fire, speed, and armor protection. Though the tank was the main maneuver weapon, it must also rely on the cooperation of other combat arms, he argued. Guderian quoted the famous British tank proponent, J.F.C. Fuller, who stated that tanks tied to the infantry decreased the value of that weapon, a problem he found in American and French armies. The mission of the motorized infantry and motorized artillery or the new self-propelled mount was to utilize the effect of a mass tank attack. Regarding air power, Guderian saw the necessity of providing support for the ground attack. Concluding, he stressed opposition to infantry accompanying tanks, the significance of speed, mass, and surprise, and the importance of auxil-

iary combat arms as organic to tank forces.¹³

Attempts were also made in the U.S. Army to deal with the issue of a mechanized division. Between 1936 and 1937, the Command and General Staff School at Fort Leavenworth published an instructional text describing the organization and tactical employment of a mechanized division. In the text, the mechanized force was described as “all arms,” self-contained, and capable of deep independent operations, leading to pursuit and exploitation of success. This doctrine was similar to what the mechanized cavalry was working out for years at Fort Knox. Adding to force mobility, the text saw the use of aviation for command control, reconnaissance, and tactical ground support.¹⁴

In June 1937, now-Lieutenant Colonel von Schell returned to the United States to visit a number of military bases to again assess the degree of army mechanization. This visit was a result of the courtesies extended by the German government to the U.S. Army Attaché in Berlin to visit their military establishments and inspect mechanized ve-

hicles. The mutual arrangement also provided the atmosphere for selected U.S. Army personnel to attend the *Kriegsakademie*. At the time, von Schell was chief of staff of the Inspector of the Panzer Corps and Army Motorization Bureau. The specific purpose of his visit was to examine the infantry's new light tank and cavalry's combat car, observe their maneuvers, take short rides on roads and cross country, and take external photos. Twelve military bases were on his list to visit.¹⁵ Only three, however, provided very interesting exchanges on mechanization in both countries.

At Fort Meade, the copious note taker von Schell visited with the 66th Infantry (Light Tanks), observed a combat demonstration, rode in a M2 Light Tank, and inspected tank parks and repair shops. Summaries of his impressions were submitted to the War Department and Military Intelligence Division, G-2. Regarding tactical doctrine, he criticized the U.S. Army's attaching tanks to the infantry and suggested they be given an independent mission so a breakthrough could be made broad and deep enough for a successful exploitation. He added that tanks must be supported by self-propelled artillery with 75mm guns or the equivalent. Though he commented little on technical details, von Schell criticized the light M2's armor and noisy gearshift. Nevertheless, he thought the M2 was a smooth-riding tank and was impressed with its speed and reserve power.¹⁶

Von Schell's remarks on European tanks and doctrine were very illuminating. The 66th Infantry's commander, Colonel S.S. Buckner, Jr., said that they merited serious consideration in connection with the Army's future tank doctrine. Almost predicting the success of the German invasion of France in May 1940, von Schell commented that French doctrine contemplated scattering tanks over wide fronts. As a result, he predicted, they would lose most of their tanks in the first battle. He gave credit to Soviet tanks used in the Spanish Civil War, but criticized the poor performance of Spanish tankers who did not use their tanks in mass, preferring instead to use a few at a time. Nevertheless, he inferred the Red Army had a sound tank doctrine because they believed in mass tank tactics. He added



General Chaffee, commanding the Mechanized Cavalry Brigade, with his orders group during a winter exercise at Fort Knox in the late 1930s. Chaffee is second from left and Major Robert Grow is at far right.

that their leadership was rather weak, due to Stalin's regime purging their key military leaders.

For the Italians, he had very little respect, claiming they were not fighters and knew little about tank deployment. Regarding the British, he claimed they dropped behind in tank development and tactics. Interestingly, von Schell found British leaders inclined to be somewhat visionary rather than being realistic regarding tactical doctrine.¹⁷

Next on his schedule was the Infantry School at Fort Benning, Georgia, where he had the opportunity again to examine the M2 Light Tank. He respected its speed, but criticized its high silhouette, the "Mae West" turrets as creating too many blind spots, the necessity of the crew to stand erect, and the tank's light armor and armament. These deficiencies made American tanks too vulnerable. Von Schell was puzzled that the Infantry and Cavalry should employ the same vehicle for different tactical uses. Again, he was critical of the U.S. Army for attaching tanks the size of companies, battalions, or regiments to the infantry for accompaniment because it squandered a mobile asset. Regarding German tanks, he contemplated that they would be employed in mass at decisive points, tank divisions or corps preferably. He also commented that periscopes were indispensable and that all tanks be equipped with radios for communication.¹⁸

The largest tank or combat car formation in the U.S. Army was the 7th Cavalry Brigade (Mechanized) at Fort Knox, which von Schell visited next. He examined the Combat Car M1 and observed a tactical exercise in which the 1st Cavalry, one squadron of the 13th Cavalry, and the 68th Field Artillery (Towed) participated. Afterwards, von Schell made a number of comments to General Van Voorhis. He found impractical the .50 caliber machine gun used on the combat cars as an anti-tank weapon, because in the next conflict the cavalry cannot avoid the heavy tank in an infantry fight. In this combat environment, the .50 calibers would be useless. He disapproved of the U.S. Army's autonomous branch system that was dominated by the infantry. Its war-fighting doctrine, maneuver and firepower, were solely based on World War I experience and potential operations in the North American Theater. He considered this impractical because, in the future, the U.S. military might find itself again in a European war, and would need to plan for an organization to meet that combat environment, which may contain a preponderance of tanks.¹⁹

With reference to German mechanization and motorization, he stated that its development was placed under one head. This, he claimed, eliminated a duplication of effort, equipment, and expense. For example, the Panzer Corps of three armored divisions head-

ed German mechanization. Each division had a mechanized brigade capable of employing hundreds of tanks and a *Schutzen* brigade for holding. All three armored divisions were organized to perform the infantry role as well as the cavalry role.²⁰ In the U.S. Army, the struggle between the infantry and cavalry over who controls tanks seemed ludicrous to the Germans.

Regarding developments at Fort Knox, von Schell mentioned to Van Voorhis, "You are searching and experimenting along the same lines as my army in your efforts to overcome hostile anti-tank weapons. It is a combination of speed, armor and all other means we can devise, including smoke and mass attack" to deal with this serious problem. The German officer stated that European tanks in the near future would be heavier and carry more armor plate. Light tanks, in turn, would be relegated to a reconnaissance role. However, he felt that first-class European powers would not be ready for a war for years. The French are too provincial, the Italians are too tempestuous, and the Spanish are too decadent, he noted. He was, however, concerned with England, because of its ability to control key points of Europe, such as Gibraltar and the entrance to the Mediterranean Sea, the Suez Canal, and the outposts of the northeastern Atlantic.²¹

These reports on von Schell's visits were of great interest, especially to the cavalry at Fort Knox. In addition, Grow commented that attaché reports dealing with foreign mechanization were also extensively studied. Based on this information, he believed at the time that the mechanized cavalry was ahead, in some respects, of the Germans and way ahead of the French in the doctrine of employment.²²

Apparently, the issue of tactical air support for the ground forces was not discussed. However, in August 1936, the U.S. Army attaché reported on the development of the Junkers 87 "Stuka" dive-bomber. In 1937, it entered production. German interest in dive-bombing began as early as 1934, and a few years later, Ernst Udet, the chief of the Luftwaffe development branch, showed a marked interest in the U.S. Navy's augmentation of close-support dive-bombing with the development of the Curtiss Helldiver.²³

The development of the ground attack mission was also improved by German experience in Spain. These events led

to the successful tactic that integrated the Luftwaffe with mobile ground forces, providing close air support.²⁴ Thus by September 1939, the Germans had successfully demonstrated the importance of combining airpower with the principle of fire and maneuver with the combined arms team for deep operations.

The marriage of tactical aviation with the mechanized force at Fort Knox did not progress as it did in Germany. During the interwar period, ground support attack aviation did not develop as expected late in World War I because of neglect, technical problems, and the controversy over mission and air tactics. The 1923 *Field Service Regulations: Operations* directed that one of the missions of aviation units was to attack hostile ground forces and their supporting units, including supply columns. No direction was given regarding a tactical effort against enemy tanks or in support of an infantry assault with breakthrough and accompanying tanks. This was due in part to the influence of the controversial Brigadier General William Mitchell, who had questioned the future application of ground attack aircraft because he believed that air power should focus on deep strategic operations against the enemy's supply concentrations and manufacturing areas. By the mid-1930s, ground attack aviation emphasis gave way to high-speed, long-range heavy bombers.²⁵

A U.S. Army officer attending the *Kriegsakademie* during this period of amenable exchanges also related developments in mechanization at an operational level. After returning to America, he reported on Germany's development of panzer forces for deep operations with a combined air-ground mechanized force. However, the Army Chief of Staff, General Malin Craig, greeted him with apathy.²⁶ When the United States entered the war, the liaison between armored units and aviation essential for the successful execution of a blitzkrieg were missing. Neither the Army Air Corps nor the Armored Force had a clear objective regarding ground combat aviation.

Meanwhile, von Schell, whom Guderian claimed was an energetic and indefatigable man with many stimulating ideas,²⁷ was appointed by Hitler as czar of the German automotive industry, at the same retaining the position of Inspector of the German Tank Corps and Inspector of Army Motorization.

The U.S. Army attaché in Berlin found these appointments of great importance, both from a military and commercial viewpoint. The appointments were indicative of Germany's further endeavors towards industrial and military mobilization.²⁸

While the Germans were accelerating industrial and military mobilization and finalizing their concept of a lightning war, a board of officers from the 7th Cavalry Brigade (Mechanized) looked to improving their combat capabilities as a mounted force. The Army's attitude, however, was not in agreement. A student at the Army War College summed up this attitude: "I hold here a pamphlet, 'Tactical Employment of the Mechanized Division,' used as a text at Leavenworth during the past few years. The April directive consigns the booklet to the school archives. There will be no Panzer Division in our Army."²⁹ This was in reference to the April 1938 War Department policy governing mechanization and tactical employment of mechanized forces. The policy avowed that recent operations in Spain demonstrated that "combatant arms will fight in their traditional roles." It further emphasized that the mechanized cavalry was to adhere to its traditional mission of exploiting the infantry's success.³⁰ *Army Ordnance* magazine noted that "independent tank forces are a delusion," suggesting tanks be heavily armored and function as mobile supporting artillery or as accompanying artillery for the attacking infantry.³¹

Meanwhile the Cavalry Board recommended replacing towed artillery with self-propelled guns. The board believed self-propelled artillery was necessary to neutralize antitank weapons, while providing general supporting fire for combat cars. The Chief of Field Artillery, however, disagreed. He supported towed artillery, believing that it could deliver far more supporting fire. He also regarded the mechanized cavalry's appeal for self-propelled artillery as no more than a request for a vehicle with all the essential characteristics and limitations of a tank. The solution, he argued, was a combat car armed with a cannon and sufficiently armored to withstand shelling from anti-mechanized weapons.³² Nevertheless, with support from the Chief of Ordnance a 75mm pack howitzer was mounted on a CCM1 and classified as T3, 75mm Howitzer Motor Carriage. The field artillery, however, considered the T3 unsuitable because of limited crew space.

As a result, no additional ones were built for the mechanized force.³³ Not until Major General Jacob L. Devers replaced General Chaffee as the chief of the Armored Force in August 1941 was serious consideration given to a field artillery doctrine suitable for a mounted force.

In spite of the problems acquiring self-propelled artillery and tactical air support, Chaffee's 7th Cavalry Brigade (Mechanized) continued to test and expand its operational and tactical mobility. During the Plattsburg, New York maneuvers in August 1939, the brigade, in a wide enveloping movement, completed a successful deep operation, leading to Chaffee's recommendation for an armored division.

This occurred before the Germans had launched their blitzkrieg against Poland. The following May, at the Louisiana maneuvers, the reinforced Mechanized Brigade participated for the first time in large unit operations that included a corps and three divisions. It was evident again to Chaffee and a few others who evaluated the maneuvers that, considering the German blitzkrieg, U.S. armored divisions should be created without delay.³⁴

In 1943, Van Voorhis commented that German operations in Poland in September 1939 — called the blitzkrieg — coincided with the employment of U.S. Armored Forces, which inherited its doctrine of warfighting with mobile independent units from the mechanized cavalry at Fort Knox.³⁵ To some extent, this may have some merit, because the Germans profited by American mechanization.

The Germans, however, were able to perfect the blitzkrieg doctrine, whereas the U.S. Army was reactive and not proactive due to the autonomy of the branch system. It was dominated by an infantry doctrine of fire and maneuver that was defined by the Defense Act of 1920, the 1923 *Field Service Regulation*, and the decision in 1931 by the Chief of Staff, General Douglas MacArthur, to decentralize mechanization, allowing each combat arm to develop its own branch doctrine.

These decisions denied the Army the ability to formulate a combined arms doctrine necessary to win the first decisive battle.

Notes

¹Correspondences dealing with von Schell's visit to the U.S. came from the MID (Military

Intelligence Division) Files 2257-B-78, July 1930 to June 1931, War Department General and Special Staff, Record Group (RG) 165, National Archives (NA).

²Van Voorhis quoted in "Prelude to Armor," in *Armored Force Command and Center*, Study No. 27, Historical Section, 1946, Army Ground Forces, RG 407, NA, p. 5, and *Grow Diary*, April 1933, pp. 55-56. Grow's diaries are now in the possession of his grandson.

³Grow, "Ten Lean Years: From the Mechanized Force (1930) to the Armored Force (1940)," *ARMOR* (May-June 1987), p. 22. This is part three of four parts of Grow's manuscript written in 1969 that reflected a participant's role in major doctrinal changes regarding mechanization of the U.S. Cavalry during the 1930s. It is primarily based on his daily diary. Also see Hofmann, "Tactics vs Technology: The U.S. Cavalry Experience," *ARMOR* (September-October 1973), pp. 10-14.

⁴Report of Technical Committee, 24 March, and Proceedings of Board of Officers, 25 March 1934, HQ, 1st Cavalry (Mechanized), OO 451.24/1789, Record Group (RG) 156, NA, pp. 1-5 and 1-4; and *The Daily Log of Combat Cars T4 and T5, During Test at Fort Riley*, 8-21 May 1934, *Grow Files* in possession of author. Grow was a member of the technical committee at Fort Knox that recommended the CCT4 be declared standard and procured. Also see H.H.D. Heiberg, "Organize a Mechanized Force," pp. 13-15 and "Mechanization in the Army," Lecture: Society of Mechanical Engineers, Pittsburgh, Pa., 23 April 1940, Heiberg Collection, Patton Museum of Cavalry and Armor, Fort Knox, Ky., pp. 11-13.

⁵The "Mae West" arrangement on the CCT5 was caused by the vehicle's divided power train, with the engine in the rear and the transmission in the front. The long connecting drive shaft tunnel bisected the crew compartment, causing an obstruction. Thus, the two side-by-side mounted turrets. The twin-turreted configuration was named for Mae West, a very busty (and bawdy) entertainer of that era.

⁶Heiberg, "Organize a Mechanize Force," pp. 13-15.

⁷On the evolution of the volute suspension system, see Daniel Chase, "Combat Car," in "The Development Record in Combat Vehicles," in Vol. II "Research and Development," Icks Collection, Patton Museum, pp. 18-21; Memorandum: for the Chief of Staff, Subject: Volute Suspension for the Light Tank, T2, 25 April 1934; Subject: Light Tank T2-Application of Volute Spring Type Suspension, Sub-Committee on Automotive Equipment to Ordnance Committee Technical Staff, 1 May 1934; and Subject: Light Tank T2, To: Adjutant General, 4 May 1934, RG 156, NA.

⁸"German Expert Finds U.S. Tanks would not Stand Test of War," *New York Times*, 21 November 1936, pp. 1-2.

⁹Guderian, *Achtung-Panzer! The Development of Armoured Forces, Their Tactics and Operational Potential* (London: Arms and Armour Press, reprint 1993), p. 153.

¹⁰"Army Denies Tanks are Second Rate," *New York Times*, 22 November 1936, p. 7.

¹¹Bradley, *A Soldier's Story* (New York: Henry Holt and Company, 1951), pp. 40-41.

¹²"Military Science Review," (the official publication of the German War Ministry), Subject: Motorized Combat Troops in America (A German Estimate), MID Report No. 14,504, Berlin, 1 February 1936, RG 165, NA, p. 1.

¹³Guderian, "Armored Troops and Their Cooperation with Other Arms," MID Report No. 14,994, Berlin, 15 December 1936, RG 165, NA, pp. 1-25.

¹⁴*Tables of Organization Mechanized Division (Tentative)* (Fort Leavenworth: The Command and General Staff School Press, 1936), pp. 3-24, and *Tactical Employment of the Mechanized Division* (ibid., 1937), pp. 3-4, 6, 23-24, 31.

¹⁵Memorandum for the Assistant Chief of Staff, G-2, Subject: Visit of German Army Officer to Army Posts in the United States to see Latest Type Light Tanks and Combat Cars use in the United States Army, MID Report 343-W-97, 16 June 1937, RG 165, NA, pp. 1-2.

¹⁶Subject: Visit of Lt. Colonel von Schell to Fort Meade, To: Commanding General, HQ 66th Infantry (Light), MID Report 343-W-97, 25 June 1937, RG 165, NA, pp. 1, 3.

¹⁷Ibid., p. 2.

¹⁸Subject: Visit of Lt. Colonel von Schell, German Army, To: The Commandant, The Infantry School, 21 July 1937, pp. 1-3; Memorandum For: The Commandant, 24 July 1937, pp. 1-2; and Notes regarding visit of Foreign Officer (Col von Schell, German Army) and certain views expressed by him, pp. 1-2, MID Report No. 343-W-97, RG 165, NA.

¹⁹Subject: Visit of Lt. Colonel von Schell, German Army, to Fort Knox, Kentucky, To: Adjutant General of the Army, Washington, D.C., MID Report No. 343-W-97, 23 July 1937, RG 165, NA, pp. 1-4.

²⁰Ibid., p. 2.

²¹Ibid., p. 1.

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The Army Banks On Its Tanks

by Arie O'Sullivan

(Reprinted with permission from *The Jerusalem Post*)

JERUSALEM (August 15) - When he was chief of General Staff, Amnon Lipkin-Shahak said a major problem in the territories was not how to use tanks, but how to avoid using them. The image of Palestinians destroying a 60-ton main battle tank would wreak havoc on the IDF's reputation of invincibility and serve as a further blow to deterrence.

But tanks have slowly been introduced into the 10-month conflict in the territories, and the IDF believes they have been very effective.

Yesterday's assault on Jenin proved the IDF faces no real barriers when dealing with the Palestinians. It moved into the town center with impunity, some tanks coming under light-arms fire which bounced harmlessly off their armor. Soldiers remained inside with their hatches shut and suffered no casualties.

The main impact of a tank in the territories is deterrence. The main effectiveness of a tank is its weapons systems — most importantly, its night vision. Its thermal cameras can pick up targets over a kilometer away and quickly relay the information to engaging forces. Many Palestinian snipers and armed squads have been located and dealt with this way.

"Today, most of the successes in the territories are due to the tanks there," said a senior tank officer.

Officers and soldiers alike say that the minute a tank appears on any scene, the shooting stops and the gunmen flee. "They are afraid," said a senior tank officer. "Not only

that, but when our soldiers see a tank they feel more assured."

The major threat to a tank is not from anti-armor rockets; the Palestinians are not believed to have any that could cause serious damage. A tank's vulnerability is in the possibility that hostiles will clamber onto it and overcome its crew. For this reason, the IDF has a strict doctrine of enforcing a "dead zone" around its tanks, allowing no one to approach.

"Remember that photograph of the young Palestinian standing in front of a tank and throwing a stone at it?" said a senior officer responsible for developing the doctrine for using tanks in the territories. "Well, that won't be allowed anymore."

"There are red lines for every tank position which no one passes. No one will get to a tank. That is the rule," said another officer.

In principle, a tank marks its dead zone with machine-gun fire. In practice, this has yet to be done.

In fact, tanks may only open fire with their cannon upon receiving authorization from the brigade commander. They must verify three things: the source of enemy fire; that no civilians are endangered; and that the cannon fire will be effective. When tanks do open fire, their rounds are more lethal than those of attack helicopters.

Senior tank officers denied that the increasing urbanization of the "battlefield" seriously hampers the use of armor.

"Sure, we are like a bull in a china shop. But that is not going to stop us from being there," said one officer.

Fuel-Air Explosives Mature

First Used in Vietnam, Now in Chechnya, “Vacuum Bombs” Proliferate in Many Forms

by Captain Douglas Huber

More than 200 years ago, in 1785, a small city in Italy put itself on the map when a bakery storeroom exploded. This first recorded dust explosion occurred in Turin, not far from France’s border. What apparently happened was that flour dust filled a tiny storeroom and a lamp ignited the powder, causing the blast.

Since then, farmers and scientists have been studying these awesome explosions in an effort to learn how to stop them from happening. As farming became an industry, farmers needed to store more grain before sending it to market. As the size of grain storage facilities grew, so too did the explosions. One tragic modern example was the detonation of a grain storage silo in Westwood, Louisiana, which killed 36 and wounded nine more in 1977.¹ Scientists now label these explosions as “thermobaric” — a chemical reaction that produces extreme pressure and heat very rapidly.

Three things must be present for dust explosions to occur. There must be dust suspended in the air, oxygen present to support combustion, and a spark to initiate the explosion. As the grain particles get smaller, the explosion gets bigger due to the increased surface area.²

In the early 1960s, scientists began experimenting with this concept to produce a weapon that uses the same principle. But this time they were not using dust; they were using volatile gases and finely powdered explosives.

The concept of fuel-air explosives (what the Russians call “vacuum bombs”) is very simple. The two-part warhead first detonates, forming an aerosol cloud. The cloud is then ignited and the subsequent fireball sears the surrounding area while consuming the oxygen. This lack of oxygen creates an enormous overpressure, the primary means of destroying the personnel or

structures that this weapon targets. In less than a tenth of a second, the pressure within the explosion can reach 427 pounds per square inch. (Atmospheric pressure at sea level is a little less than 15 pounds per square inch.)³ Personnel are literally crushed to death by the force. The Foreign Military Studies Office at Fort Leavenworth, Kansas, stated that fuel-air explosives “can have the effect of a tactical nuclear weapon without the residual radiation.”⁴

Bunkers, buildings, and other fortifications that are not hermetically sealed are subject to the lethal force of a fuel-

air explosive as well. The fuel-air mixture flows easily into these cavities and, when detonated, amplifies the destruction of the load-bearing components of the structure.⁵ This type of blast can also be used to clear minefields, prepare and clear landing zones for helicopters, and as an herbicide, destroying crops and vegetation.

mobaric weapons, having created over 14 weapons to deliver these munitions. The first Russian fuel-air weapon was the RPO-A Shmel, or “Bumblebee.” Created in the late 1970s, it is a shoulder-fired infantry rocket flamethrower that gave soldiers the capability of engaging hard-to-reach spots such as mountains and populated areas. The Shmel delivers highly accurate fires and is versatile enough to engage several different types of targets.⁷

According to the Russian company that manufactures the Shmel, this launcher

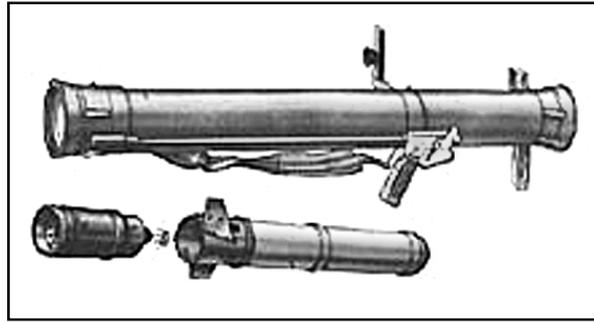


A thermobaric “dust explosion” killed 36 at this Louisiana grain elevator in 1977. Weapons designers have long attempted to exploit this effect in a host of controversial weapons that kill with fire and intense blast effects.

can deliver a 2.1-kilogram (4.6 pounds) shell containing a fuel-air explosive up to 1,000 meters. It is a 93mm tube that weighs a little over 23 pounds and can be fired from a standing, kneeling, or prone position.⁸

This weapon creates a fireball 50 meters in diameter that reaches temperatures of 2,500 degrees Fahrenheit. The

The United States first used fuel-air explosives in the 1960s in Vietnam to destroy Viet Cong tunnels and to clear forested areas for helicopter landing sites.⁶ When the Soviets learned of fuel-air technology, they began developing their own weapons. Russia is now on their third generation of ther-



Russia's arsenal of over 14 types of fuel-air weapons range from the RPO-A Shmel shoulder-fired infantry rocket flamethrower, above, to the TOS-1 "Buratino," at left, a T-72 tank chassis with 30 220mm rockets in its launcher.

manufacturer of the Shmel, the KBP Instrument Design Bureau, compares the effect of the weapon to the destructive power of a 122mm or 152mm high-explosive fragmentation artillery round. In 1988, this weapon was used in Afghanistan with great success. Afghan rebels named it the 'Satan stick.'

According to *Jane's Infantry Weapons*, the Shmel can be equipped with a jet flame thrower, which shoots incendiary pellets that are scattered on impact. The other is a jet smoke projector that creates a smoke screen between 55 and 90 meters long.⁹

On the opposite end of the fuel-air weapon spectrum is the tank-like TOS-1, or Buratino ("Pinocchio"). Essentially a multiple rocket launcher, it is built on a T-72 chassis, and can carry 30 220mm rockets ready to fire. The rockets have a minimum range of 400 meters and a maximum effective range of 3.5 kilometers. This vehicle weighs 46 tons and has a cruising range of 550 kilometers. A crew of three mans the Buratino. The "zone of ensured destruction" is 200 meters by 400 meters. The Buratino is equipped with a laser rangefinder and a ballistic computer.¹⁰ Russians first used this weapon in the early '80s in Afghanistan's Panjshir Valley during the Soviet-Afghan War. According to the manufacturer, the TOS-1 "is designed for defeating the enemy manpower on the open country and in defenses, as well as for lightly armored vehicles and transport."

Other Russian fuel-air weapons include:

- ODAB-500PM Bomb, a fuel-air-explosive-filled bomb
- KAB-500Kr-OD Bomb, a TV-guided fuel-air-explosive-filled bomb
- ODS-OD BLU dispenser, with ODS-OD BLU cluster bombs (8 per

dispenser). This cluster bomb dispenses fuel-air-explosive-filled bomblets.

- 300mm 12 tube rocket-launcher 9A52-2 (Smerch), a reactive-surround warhead on a 300mm rocket
- 220mm 16 tube rocket-launcher 9P140 (Uragan), a reactive-surround warhead on a 220mm rocket
- Shturm Antitank Guided Missile, a helicopter-mounted rocket with FAE warhead
- ATAKA Antitank Guided Missile, a helicopter-mounted rocket with FAE warhead
- S-8D (S-8DM) 80mm rocket, an aircraft-mounted rocket with FAE warhead
- S-13D 122mm rocket, an aircraft-mounted rocket with FAE warhead
- Kornet-E Long Range Antitank Guided Missile System, with thermobaric HE warhead, an infantry antitank rocket with FAE warhead.

These weapons entered the international spotlight when Russia began using them in the war with Chechnya. Several sources have reported that Russians used fuel-air explosives against Chechen rebels, especially in the capital, Grozny. Reports also indicate that these weapons have been very successful in helping the Russians defeat the Chechens.

On June 27, 2001, Reuters reported that Russian border guards used flame throwers against a group of rebels trapped in the Caucasus Mountains.

Vladimir Makarov, the border guards' deputy chief of staff, said high command had dispatched helicopter gunships carrying flame throwers to flatten and burn a piece of forest and remote huts where some 40 separatist guerrillas were hiding.

"We don't want to send our soldiers into battle to comb the area," Deputy Chief Makarov told state RTR television. "We don't want them to die. But once we have obliterated everything there with fire, they will go in to mop up." He stressed the effectiveness of flame throwers in attacks on people sheltering in buildings. "We have just struck two stone houses with flame throwers and nobody is firing back from them any more," he said. "I rate chances of staying alive after such strikes as very small."¹¹

Top Russian officials have acknowledged that fuel-air explosives are very effective in destroying enemy soldiers in caves, tunnels, and mountainous areas.¹²

The Russians aren't the only ones that are using fuel-air explosives. While the British currently have no fuel-air weapons in their inventory, they are looking to develop a weapon that would be effective against bunkers and other fortifications.¹³ According to an article in *Jane's Defense Weekly*, Britain's Defence Evaluation and Research Agency is looking to use fuel-air technology for this weapon.¹⁴

As noted, America has used fuel-air explosives in Vietnam to clear jungle foliage, destroy Viet Cong tunnels, and clear heavily-wooded sites for helicopter landing zones. According to the *Bulletin of the Atomic Scientists*, U.S. Army Special Operations used the "Big Blue 82" or "Daisy Cutter." Last used in Vietnam by U.S. Special Forces for clearing helicopter landing sites, this 15,000-pound bomb is filled with an aqueous mixture of ammonium nitrate, aluminum powder, and polystyrene soap. It can only be launched from a cargo aircraft, the MC-130 Hercules, by rolling it out the rear cargo door.¹⁵

Continued on Page 17

Improving LAV III Survivability

by Stanley C. Crist

It can be convincingly argued that the LAV III is not the best available armored vehicle with which to equip the Interim Brigade Combat Teams (IBCTs). Nevertheless, since the decision has been made to acquire LAV III variants for this purpose, attention should now be given to maximizing the combat effectiveness and survivability of this family of vehicles.

There are two areas of concern that do not seem to have been adequately addressed to date — armor and firepower.

ARMOR

Much publicity has been given to the fact that the standard appliqué armor of the LAV III provides protection against heavy machine gun (HMG) fire. While this information is indeed true, it is also rather irrelevant. The greatest threat in urban combat is not from 14.5mm machine guns, it is from anti-armor weapons like the RPG-7, which have shaped charge warheads that can punch through the LAV's hull as if it were made of tissue paper.

The German manufacturer of the LAV's standard armor appliqué has reportedly also developed bolt-on panels that do protect against penetrations by shoulder-fired HEAT munitions. The easiest way to improve LAV III survivability would be to simply discard the relatively useless 14.5mm armor and replace it with RPG panels, but for transport by C-130, the thickness of the RPG armor would almost certainly preclude it from being attached to the sides of the vehicle until after exiting the aircraft. But it should be possible to have RPG armor bolted onto the front and rear of the vehicle. (Of course, this would not pose a problem for transportation by C-5 or C-17, as the larger cargo bays of these aircraft would permit all-around installation of RPG armor panels on the LAV III.)

FIREPOWER

Armament for the LAV III Infantry Carrier Vehicle (ICV) is a single ma-



The standard appliqué armor on the LAV III does not protect against hand-held antiarmor weapons like the RPG-7 — the primary threat in urban combat. The author argues for additional protection from kits that would withstand attack from RPG-type HEAT warheads (Photo: GM Defense)

chine gun, mounted on — and fired from — a Remote Weapons Station (RWS). The RWS will undoubtedly be a useful feature for engaging enemy personnel who are armed only with rifle-caliber weapons, but it is totally inadequate for neutralizing RPG gunners.

The U.S. should learn a lesson from the Israeli Defense Force (IDF), which has more experience in mechanized operations on the urban battleground

than any other contemporary army. IDF infantry vehicles typically mount three or four machine guns, thereby giving the crews the means to simultaneously engage multiple, widely spaced targets. This capability can be crucial to survivability in the urban environment, where RPG teams can be expected to make coordinated attacks on intruding armored vehicles. A vehicle crew that is armed with only a single machine gun cannot respond effectively to a threat of this nature.

The U.S. Army learned this lesson at least twice in past conflicts, but seems to have a short institutional memory on the subject, as it reverts to a solitary machine gun for ICV armament. During WWII, half-track armored personnel carriers were often equipped with one or two .30 caliber machine guns in addition to the standard .50 caliber Browning. Later, during the Vietnam War, the Armored Cavalry Assault Vehicle (ACAV) also was armed with a cupola-mounted "fifty" and a pintle-mounted "seven-



Installing additional M240 machine guns adjacent to the squad leader's hatch and both troop hatches would enable the ICV crew to give immediate return fire on multiple RPG teams. This technique has been successful in the Israelis' recent battles and was a common addition to the M113s in the Vietnam war. (Photo: FN Manufacturing Inc.)

Fuel-Air Explosives from Page 15

six-deuce” at each side of the cargo hatch.

The same concept should be applied to the LAV III infantry vehicle by installing a 7.62mm M240 machine gun adjacent to the squad leader’s hatch and each of the two troop hatches. Simple pintle mounts would be the easiest and least expensive method of installation, but would provide the smallest engagement arc. Elbow-type pintle mounts — such as were used on the ACAV — would allow a greater area to be covered by each machine gunner, and therefore would be preferred to the basic pintle mount. The optimum approach would be to install skate mounts like that surrounding the loader’s hatch on M1-series tanks, but this would require a redesign of the top rear of the ICV, adding to the cost and possibly causing a delay in fielding the LAV III.

SUMMARY

Considering the current emphasis on urban warfare, and the losses of men and machines to the ubiquitous RPG-7 in places like Somalia, Lebanon, and Chechnya, bolt-on armor that protects against handheld anti-armor weapons is absolutely vital. In addition to this “passive” protection, however, installing pintle-mounted 7.62mm machine guns would not only provide the means for “active” self-defense, but would also greatly increase the offensive capability of the ICV.

Incorporating these changes would substantially improve the effectiveness and survivability of the LAV III and IBCT personnel. Unfortunately, the record is not promising. Bolt-on armor was developed for the M113A3, but never fielded, and the multiple machine guns of the WWII half-track and the Vietnam-era ACAV were deleted in the aftermath of those conflicts. However, one can hope...

Stanley Crist served as a tank commander, tank platoon sergeant, training NCO, and scout section leader in the 3rd Battalion, 185th Armor. He has had numerous articles about armored fighting vehicle design published in *ARMOR* and other defense-related publications.

U.S. Central Command, those responsible for actions in the Middle East, admit that some fuel-air explosives were used during Desert Storm but will not say which ones.¹⁶ The Naval Air Warfare Center states that the U.S. Marine Corps asked for fuel-air weapons to clear minefields, but the center never confirmed that these weapons were actually used in Desert Storm.

Fuel-air explosives have raised the ire of some human rights groups, among them Human Rights Watch. This organization, based in New York, seeks to “protect people from inhumane conduct in wartime.”¹⁷ In February 2000, Human Rights Watch published a background paper on fuel-air explosives in which they condemn Russia for their use.

Their biggest complaint is that an army cannot control whom it kills when using fuel-air explosives. They also feel that these bombs are inhumane. In this paper, the Human Rights Watch cites a 1993 Defense Intelligence Agency report that describes the effects of a fuel-air explosive:

“Those near the ignition point are obliterated. Those at the fringe are likely to suffer many internal, and thus invisible injuries, including burst eardrums and crushed inner ear organs, severe concussions, ruptured lungs and internal organs, and possibly blindness.”¹⁸

Another Defense Intelligence Agency study suggests that the shock wave created by a fuel-air explosive would only cause minimal brain damage, leaving victims of this weapon to suffer for several seconds or minutes until they suffocate.¹⁹

The Campaign for Nuclear Disarmament is also opposed to fuel-air explosives, stating that these weapons “blur the distinction between low-yield nuclear weapons and conventional weaponry.”²⁰

“Based on the Russians’ practices in the war in Chechnya so far, we have no faith that they will use fuel-air explosives responsibly,” said Joost Hilterman, a spokesman for Human Rights Watch. “Their use against populated areas would violate international norms on indiscriminate attacks.”

The Russians have proved that use of fuel-air explosives is both practical and effective in warfare. These weapons cre-

ate problems for both mounted and dismounted forces due to their wide coverage. As technology increases, these weapons will become more powerful and more lethal, drawing the attention of armies, politicians and human rights groups alike.

Notes

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³“A ‘Crushing’ Victory: Fuel-Air Explosives and Grozny 2000,” Lester W. Grau and Timothy Smith, Foreign Military Studies Office, Fort Leavenworth, Kansas, August 2000.

⁴Ibid.

⁵Ibid.

⁶<http://www.wmd-nm.org/members/office/glossary/index.asp?where=f>

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¹⁰“A ‘Crushing’ Victory: Fuel-Air Explosives and Grozny 2000.”

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CPT Doug Huber, an Ohio State University graduate with a BA in Journalism, served as a platoon leader, line company XO and S5 civil affairs officer in Bosnia. A recent graduate of ACCC, he is currently attending CAS3. Huber is the author of *ARMOR*’s May-June 2001 cover story, “Mission to Boljevec.”

The Effectiveness of Artillery and the Maneuver Commander

by Colonel Bruce B. G. Clarke (Retired)

The recent controversy about the effectiveness of field artillery at the NTC is gaining extensive coverage and generating debate within the Field Artillery branch. But my experience suggests that the problem, and its solution, does not lie in the field artillery community but with maneuver brigade commanders. They are impatient in their execution and do not ensure that fires are integrated into maneuver plans at every level. I learned these lessons at the NTC school of hard knocks and would like to pass on my maneuver-oriented solution in terms of responsibilities for each echelon of maneuver command.

For artillery to be effective on the battlefield, rounds must arrive on the battlefield where the enemy is — not where he was — at the time that the request for fires was submitted. To do this, critical targets and decision points must be observed and the designated “trigger-pullers” must perform their duties. This creates the following requirements for commanders at every level.

The brigade commander must:

- Position his artillery to support his scheme of maneuver. With the speed of maneuver of modern teams and task forces, there is a possibility of outrunning one’s artillery. This means that firing units must be integrated into the maneuver scheme so that the tubes are positioned to fire at the critical places and times.

- Provide a clear explanation of his vision — how he sees the battle unfolding and where the artillery fits into that vision. This is directly tied to the position of the artillery and provides the focus for targeting.

- Designate his critical targets as part of the top-down fire-planning effort. In this process, the use of sequences of fires keyed to options can be very useful. We will use an example to highlight this approach.

- Position the brigade COLT to observe critical targets and assign subordinate units to observe the others.

- Tightly control the number of targets allowed. This is tied to the commander’s focus and vision of what he wants his artillery to accomplish.

The maneuver battalion commander must:

- Understand the brigade commander’s vision of the battle.

- Refine the brigade target list

- Designate his critical targets and assign primary and secondary responsibilities for executing those targets. Execution is tied to decision points, which are observed by battalion or brigade assets.

At the company level, the company commander must:

- Understand how his mission fits into the higher commander(s’) vision of the battle.

- Assign primary and secondary responsibilities for executing targets — observing decision/trigger points.

- Plan the maneuver of his fire support team (FIST) as he does a platoon, so the FIST can provide fire support in a timely and accurate manner.

- Be patient in execution, i.e., wait for the artillery to influence the battle. (When artillery rounds impact, so should long-range direct fires.)

During a 30-minute direct-fire battle, the direct support (DS) battalion can only fire four or five battalion four-round fire missions, for a total of 72 rounds per mission. (The reduction of the size of DS battalion has increased the number of rounds that each tube must shoot to bring effective fires on the target. For example, to get reasonable target effect on a Russian-type force of BMPs and T72s, 48 to 72 rounds are required.) The brigade and battalion commanders thus must ensure that those four or five missions are executed when and where they want them.

In this regard, a sequence of fires that integrates the fires of the DS artillery

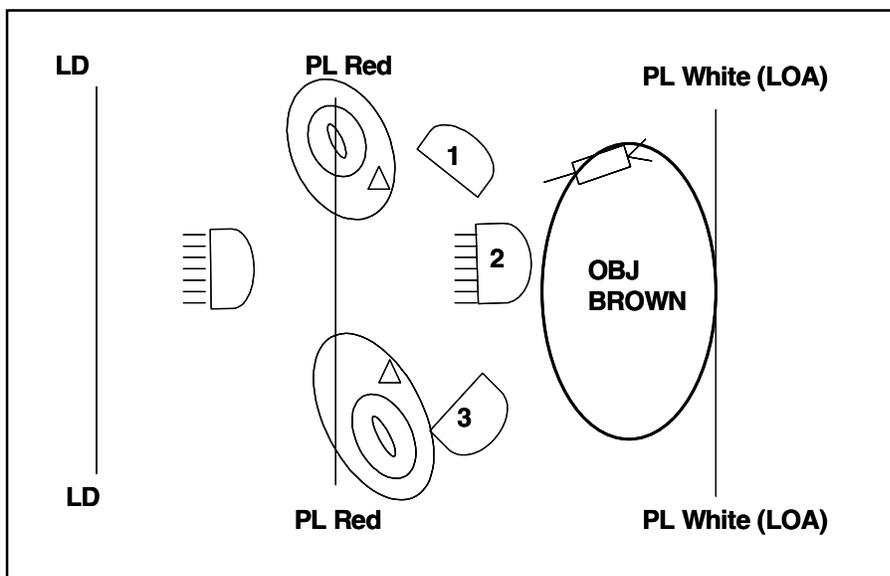


Figure 1. Typical Motorized Rifle Company Defense. A platoon-sized element in the security zone between the line of departure (LD) and phase line red (PL Red). The main defense has three motorized platoons and an anti-tank (AT) platoon defending the rear slope of a pass between PL Red and PL White with observation posts on the forward slopes of the hills.

battalion with the maneuver of supported forces is a key ingredient of success. Such a time-phased plan will ensure that the artillery tubes are positioned and available for those four or five missions.

A sequence of fires tied to each of the maneuver options also allows the maneuver commander to position and plan for fires of his mortar platoon to complement and reinforce the other fires. During periods other than the intense 30-minute close-in battle, the indirect fires would be planned on anticipated targets and then shifted based upon the situation. The intelligence preparation of the battlefield (IPB) is critical in the development of such a sequence — trigger points must be determined and included in the plan to ensure the fires arrive on target in a timely manner. Figure 1 illustrates a scenario for such a sequence of fires.

Given the enemy disposition in Figure 1 and the mission to seize an objective in the vicinity of the Limit of Advance (LOA), the brigade commander issues his intent. He wants to rapidly attack and destroy enemy elements in the security zone to protect friendly lines of communication and continue the attack to seize the objective, emphasizing speed and massing combat power on an enemy flank. He wants to avoid being sucked into a kill sack and forced to engage the entire force. This plan would enable the enemy's defeat in detail.

The brigade commander assigns this mission to a task force and builds the sequence of fires to support the scheme of maneuver and his intent.

The task force commander and his fire support officer (FSO) are given a top-down target list and a fire support execution matrix. The fire support execution matrix contains those targets the brigade commander considers crucial to the battle and tells the task force commander to assign observers to execute the targets. As he develops his plan, the task force commander includes the brigade-directed targets, assigns execution responsibilities, and sequences artillery and mortar fires with his mortar fires, direct fire, and maneuver.

In this situation, the task force commander plans an on-call artillery mission on the enemy platoon in the secu-

rity zone. This mission starts the sequence of fires shown in Figure 2.

If the platoon in the security zone was located on a planned target location, the time from the call for fire to rounds complete can be five minutes for three battalion volleys (72 rounds). If the planned location is inaccurate, the fire mission will take eight to ten minutes to complete. Winning the reconnaissance battle and developing accurate locations for targets in the sequence of fires can save three to five minutes per artillery fire mission. In a 30-minute battle, that can mean the difference between three and five battalion fire missions.

In the planned sequence of fires, the task force commander has decided to penetrate the enemy's defense on its right flank by integrating direct and indirect fire on the right flank platoon. At the same time, his mortars will fire on the other two platoons to fix them and isolate the right platoon.

The task force commander's sequence of fires includes specific targets that the brigade commander considers critical (or refined adjustments of the brigade targets) and targets that he and his company commanders develop to support their scheme of maneuver.

In units where the artillery fire is effective, company commanders position their FISTs on the battlefield to call for the preplanned targets that support their schemes of maneuver — not just have the FISTs follow them around the battlefield. This includes positioning them to execute the battalion or brigade commander's assigned targets. Successful company commanders plan to maneuver their FISTs in the same manner that they plan to maneuver their platoons — they develop a series of positions for the FIST to occupy to facilitate their mission.

Synchronization of Fire Support and Maneuver

The development of the brigade synchronization matrix and its supporting sequence of fires, maneuver plan, etc., allows for the synchronization to occur down to the platoon level. When such synchronization happens, mass is achieved and victory is assured.

An example of such a brigade-level synchronization plan is shown in Figures 3 and 4. Figure 3 shows the brigade deep attack on a motorized rifle regiment (MRR) on one of two avenues of approach. Deep fires were the responsibility of the brigade COLTs and

Indirect Fires Sequence of Fires			
Time	Target	Observer/Executer	Firing System
H + 5 min	Platoon in Security Zone	TM____	FA
H +13 min	OP	TM____	FA
H + 13 min	OP	TM____	Mortars
H + 21 min		TM____	Mortars, 50 % HE, 50 % smoke
H + 21 min	PLT Psn 1	TM____	FA
H + 23 min	PLT Psn 1	TM____	Mortars, 50% HE, 50 % smoke
H + 29 min	PLT Psn 1	TM____	FA
H +29 min	AT PLT	TM____	Mortars, 50% HE, 50 % smoke

Figure 2: Sequence of Fires. This table shows the on-call artillery mission the TF commander planned on the enemy platoon in the security zone (See Figure 1). In the operation synchronization matrix, the movement of the artillery is keyed to each phase of the battle (Figure 3). To satisfy the commander's intent, sufficient firing batteries/platoons must be in position and ready to fire during the crucial stage(s) of the battle.

EVENT/PHASE		Enemy COA 2	B1	Enemy Situation	B2	BDE Deep Battle, Phase II	B3	Battle Handover, Phase III	B4	TF Defense
Enemy Situation/Course of Action		Regt attacks w/2 MRBs up, 1 Reserve								
Friendly Decision Points ★		1 MRB on AA1			★ 1	EA BLAST				
Phase Lines (PL)		2 MRBs on AA2 or AA3			AA1 →	EA BURNT				
Named/targeted Areas of Interest (NAI/TAI)					AA2 →					
Objectives					AA3 →					
Estimated Time						H Hour to H+20		H+30 to H+40		
INTEL	Assets GSRs LP-Ops LRSP Patrols Scouts	Observer		NAls and TAls are the same for COA 1						
	Requests to DIV	CDR'S PIR		Same for COA 1						
MNVR	Considerations Deep Battle Security Close Battle Rear Area Reserve Counter Recon	TF 4-37		Release EN OPCON to 201 FSB				Defend in Sector NLT , Allow no penetration of PL Barrow Accept BHO. PL Billings		Defend in Sector PL Alaska to PL Barrow
		4-1 AVN						Conduct Screen PL Alaska to PL Montana with OH 58Ds x hours to y hours		
		201 FSB		Construct SP 208 w/EN						
		3-18 FA (DS) 2-637 FA (R)						3-18 FA DS 4-37, 2-637 fires not available to 4-37 2d Echelon BNW/CAS		R 3-18 FA
FIRES	TF Mortars									
	Priority of Fire			COLT, % 4-1 AVN		COLT, % 4-1 AVN, % TF 4-37		TF 4-37		4-37, % 201 FSB/BSA
	Target Groups/EAs				★	1, Dog, Cat, Moose, Bird, F10, F11, F12			★	4, F15
	FASCAM			% Valley of Death						
	CAS				★	5 EA Blast, Bake, Burnt H +20 2 ★		Immediate CAS to 4-37		
	ATK Helo									

Figure 3. Part of the brigade synchronization matrix. This matrix integrates fire support with maneuver during a BDE deep attack of a MRR on one or two avenues of approach. The COLTs were responsible for the deep fires and the TF for priority of fires forward of the FEBA. (The decision points are shown in Figure 4.) The matrix shown here and the one in Figure 4 clearly delineate target responsibilities, battle hand-off, and sequencing of fires to achieve the BDE commander's intent. The actual 3½-foot by 4-foot matrix includes sections for air defense, command and control, combat service support, and other BOS. In automated TOCs, much of this can be done using a computer workstation.

the aviation element. Forward of the forward edge of the battle area (FEBA) there was a battle hand-off line where the forward TF assumed priority of fires with specified targets to execute in its engagement area. This process for the artillery is shown in Figure 4. In this example, there were multiple sequences of fire developed. Each enemy course of action (COA) prompted a complete planning cycle. In this case, the enemy turned and the realization of that action prompted sequence B, Course of Action 2 to go into effect. This planning technique allows for multiple branches and sequels and the corresponding artillery fires to support them. The only limitation is the planning time for each branch and sequel. In some cases, such as the use of FASCAM in the example, you may be seeking to deny the enemy a course of action and force him to follow a course that you prefer.

The reader should note the use of decision/trigger points for the execution of specific targets in specific areas. Each of these trigger/decision points requires a sensor or observer to signal when the clock starts. Once a sequence starts, the enemy can be under continual fire until he changes, in an unforeseen manner, his activity.

With the fires orchestrated and organized in this way, the artillery commander is now free to plan the movement of his batteries and can deconflict firing areas with the brigade staff. Fire and movement are thus carefully linked.

The sequence of fires shown has extended the time of engagement and thus enemy casualties while ensuring accurate fires. Increasing the depth of the battlefield has increased the time to engage. The sequence of fires causes the fires to move with the anticipated

movement of the enemy, and the designated trigger pullers/observers means that if the enemy deviates a new course of action is immediately taken and fires are shifted accordingly.

In the rehearsal and brief-back portions of the preparation phase, the brigade commander can ensure that his intent is being followed by tracing the assignment of targets all the way down to the FIST team or platoon that is responsible for pulling the trigger on a specified target. This is easy to do if each level of command is using synchronization matrices for the assignment of responsibilities. In digital units, this may also be tracked through digital methods. AFAATDS, FBCB2 and other software/hardware improvements will facilitate the process discussed in this article.

In many cases, synchronization has been planned and artillery targets de-

Brigade Fire Support Execution Matrix

1. Commanders Intent for Fire Support:
 - a. Fire FASCAM in Valley of Death (4000) vicinity, and follow that up with a series to stop thrust there.
 - b. Plan series in southern corridor both north and south of hill 700 to attrit enemy in deep battle.
 - c. BHO to TF 4-37 at PL Billings. Mass both battalions PL Billings to PL Alaska.
 - d. COLT, OH58Ds deep to fight deep battle.
2. Fire Support Execution Matrix

Decision Points						
	Phase I Occupation	PL Montana Phase II BDE Deep Battle	PL Billings Phase III Battle Hand Off BB0017, BB0018, BB0016	PL Alaska TF Defense B18, B28	PL Barrow Phase IV Rear Battle	
TF 4-37						
4-1 AVN	OH 58D targets					→
COLTS		Dog, F10, Cat, F11, Mouse F12				
BDE		Immediate CAS in EA Blast, Burnt, Bake in (EN) w/COLT				
FPF, Priority Targets	COLT 3-Pri Targets	COLT 3-Pri Targets	TF 4-37, 3 Pri Tgts, 1 FPF	TF 4-37, 2 Pri Tgts, 2 FPF		BSA 2-Pri Tgts
Priority of Fires	COLT % 4-1 AVN	COLT % 4-1 AVN, % TF 4-37	TF4-37	TF 4-37, % BSA		BSA
FSCOOD Measures		CFL--PL Billings	CFL--PL Billings, % PL Billings	CFL--PL Alaska, % PL Barrow		CFL PL Barrow
BSA						

3. Coordinating Instructions:
 - a. BDE CFL PL Billings
 - b. Target allocations: BDE 35, TF 4-37-15, BSA-10
 - c. COLT positioned vicinity of 332983 under BDE control to observe Bicycle Lake Pass
 - d. Trigger for F10, F11, F12 is vicinity 357011

Legend:
 FPF--Final Protective Fires
 Pri Tgts--Priority Targets
 CFL--Coordinated Fire Line

Figure 4: Fire Support Execution Matrix which provides more detail than the BDE Synchronization matrix shown in Figure 3. This matrix shows the decision points for the TF's priority of fires forward of the FEBA.

veloped, but mass isn't achieved. This is usually because either discipline has broken down or maneuver commanders lose patience. Discipline breaks down when we let targets be fired upon that are not the ones that are **critical** to the commander's intent. The fire direction officer (FDO) and artillery battalion S3 are key in helping the FSOs and the fire support coordinator (FSCOOD) maintain such discipline.

Patience isn't practiced when the maneuver commander isn't willing to wait the five to seven minutes it takes to get artillery fires on the target and he hasn't built his sequence of fires to support his scheme of maneuver. He goes charging into a kill sack instead of waiting.

In either case, mass isn't achieved and victory escapes our grasp. Synchronization of fires and maneuver in our plans and ensuring that we have the patience and discipline to execute our plans is the key to effective artillery fire at the NTC and, ultimately, in combat. The burden for such an effort rests on the maneuver commander. He sets the intent and battlefield framework and provides the priorities. He is an integral part of the artillery's effectiveness.

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Legend

% = On Order AA = Assembly Area ALO = Air Liaison Officer BHO = Battle Hand Off BSA = Brigade Support Area CAS = Close Air Support Cdr's PIR = Commander's Priority of Intelligence Requirements DS = Direct Support EN = Engineer Unit	EW = Electronic Warfare FASCAM = Family of Scatterable Mines FSB = Fire Support Base GSRs = Ground Surveillance Radars LP/OPs = Listening/Observations Posts LRSD = Long-Range Surveillance Detachment OPCON = Under the Operation Control of R = Reinforcing SP=Strongpoint
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United Defense

Armored Cavalry Mortars: Operations and Myths

by First Lieutenant John M. Ives

The average mortar section in an armored cavalry troop is misunderstood and under-utilized. Myths and untold secrets surround the cavalry's only organic infantrymen and their elusive skills. Several Mortar Section Live Fire Exercises and a Cavalry Troop Mortar Section ARTEP put the myths to rest and revealed many secrets to this mortarman.

The basic workings of the 120mm mortar system and the M1064A3 Mortar Carrier lay directly in the hands of the mortarman themselves. However, the cavalry troop's leadership must understand what those systems can and cannot do to properly train their mortarman and succeed on the battlefield.

First, the basics. One must know round and fuze types, how the mortar section conducts troop operations, and training for the mortar section. Begin with: *FMs 23-90, 23-91, 7-90; ARTEP 7-90 MTP; and STP 7-11c14-SM-TG*. These texts should answer your questions and provide technical details. My article is a simplified list for use as a guideline and should in no way circumvent the manuals.

THE EQUIPMENT

The three basic rounds in the 120mm mortar family — high explosive, illumination, and white phosphorus — can produce several effects with the proper fuzes. Typically, each round weighs 33 pounds and is shorter than a tank's sabot round.

The High Explosive (HE), M933 or M934, is a four-charge mortar round with a kill radius of 60 to 75 meters, dependent on the terrain. The round can be stored vertically or horizontally in the mortar carrier.

The M930 Illumination (ILLUM) round can illuminate a 1,500m-diameter area for 60 seconds. When the timing is set for ground burst, ILLUM can mark a lane for close air support (CAS) missions and target reference points (TRP), given the heat of the round. In addition, the ILLUM round can counter enemy image intensification devices, thanks to its 1,000,000-candlepower brightness. (As of February 2001, the M930 is listed as XM930, still in developmental stages.)

The M929 White Phosphorus (WP) round remains the most misunderstood

mortar round. The WP round must be stored vertically or the liquid WP will coagulate on one side, thus making it fly like a wounded duck. WP liquefies at 100 degrees F. Even in cooler temperatures, the viscosity of the WP is such that it will ooze to one area if stored horizontally. Although the burst radius is much smaller than that of an HE round, WP can also cause external damage to enemy tanks and BMPs.

All rounds come with the M745 point detonation (PD) fuze already attached (except the M934 HE, which comes with the M734 multi-option fuze).

The M734 multi-option fuze has settings for PRX, NSB, DLY, and IMP. The PRX setting will burst three to thirteen feet from an object, and the NSB lowers the burst height to closer than three feet. PRX and NSB settings work well against foxholes, trench positions, and enemy dismounts in the prone position. Snow, water, ice and tree canopies affect the burst height of a PRX and NSB fuze. Delay setting bursts 0.05 seconds after impact, allowing the round to travel into the ground, bunker, or through a tree canopy before it bursts. Delay fuze settings work well

in dense vegetation, and are useful in creating casualties among dismounts, as the below-ground blast disperses shrapnel, rocks, and debris more effectively than the impact setting. All settings are changed by hand.

The M766 multi-time super quick fuze can be timed to burst 6 to 52 seconds into time of flight. This allows an air burst or an impact burst. With this fuze, a good crew, or an extremely lucky one, could take down a formation of enemy choppers. Finally, the M935 point detonation fuze can be set for impact or a 0.05-second delay.

The most important thing to remember about the fuze types and capabilities is that the special fuzes arrive separately from the rounds (except for the before-mentioned M934 HE). The unit must order them long before a deployment.

The M1064A3 120mm Mortar Carrier has a five-man crew consisting of a squad leader, gunner, assistant gunner, driver, and ammunition bearer. This vehicle, with a cruising speed of 40 mph and a 95-gallon fuel tank, has a range of 300 miles and can operate for more than three days in static positions without fuel resupply. You should know that the M1064A3's engine automatically shuts off (as if empty) if fuel readings fall below a quarter-tank; crews and mechanics usually know this information. The mortar carrier holds up to 69 of the 120mm mortar rounds; however, only 24 can be stored verti-

cally, so only 24 WP rounds can be stored on each track. In case of a war-time mission, according to veterans of Desert Storm, the HE and ILLUM rounds can be strapped, with their cases, to the sides and top of the vehicle. This increases the round count by at least twenty. Small arms fire should not detonate the rounds.

The M1064A3's M121 gun system can be dismounted from the vehicle if necessary, but the weight of the gun tube, 110 pounds, and the base plate, 136 pounds, are deterrents for dismounted operations. Still, crews must train for this possibility. The fast-paced tempo of cavalry missions does not lend itself to dismounted mortar operations. With a range of 200 to 7200 meters, the M121 has a rate of fire of 16 rounds for the first minute and a sustained rate of four rounds per minute. A safety lever is located at the base of the tube and the firing pin can be changed out and cleaned. Both devices are worth checking. When the gun is layed in (oriented along an azimuth with the use of an aiming circle), it has a max field of fire of 1,666 mils (approximately 90 degrees).

Do not neglect the aiming circle, mortar ballistic computer (MBC), and the M16 plotting board. The aiming circle will aid in properly and accurately laying in the guns. It is important to declinate the aiming circle often, depending on time, weather conditions, and distance moved. Often, leaders errone-

ously skip this tedious procedure during training.

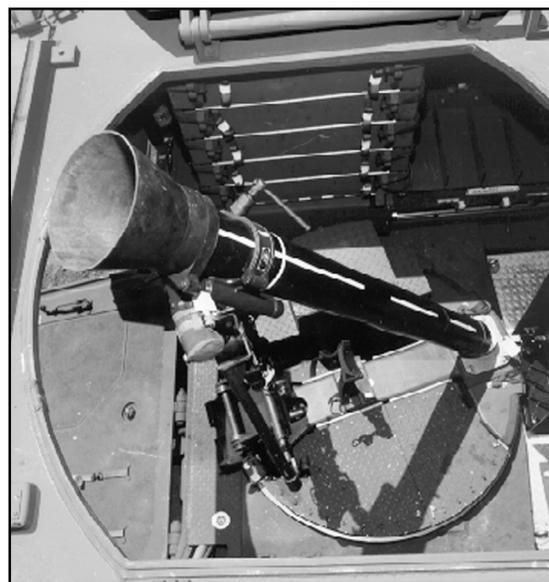
The M16 plotting board is the manual method of acquiring firing data. Although it has been replaced by the MBC, the plotting board should be used to verify the computer's data during live-fire exercises, and should be practiced during simulations.

The MBC is powered by lithium or mercury batteries, or can be attached to the vehicle batteries or the back of radio mounts in an emergency. The squad leader can either manually input the data into the MBC or the forward observer (FO) can send the information digitally with the digital messaging device (DMD).

The DMD transmits a digital call for fire directly to the MBC in either frequency hop or single channel mode. Using the digital option limits the mistakes sent during voice calls for fire and, after thorough training, can be completed twice as fast. The MBC and DMD communicate so long as the FO turns off the crypto-key on the DMD. The operation is simple and effective; however, it is a perishable skill. The FO's and the mortar men must practice this operation together to ensure both teams understand the equipment.

OPERATIONS

Mortar men speak their own language. "Direction of fire" for the mortars is the same as setting target reference points.



The M1064A3 120mm Mortar Carrier

Appendix A:

ROUNDS		
ITEM	DODIC	NSN
M933 HE	C623	1315-01-343-1941
M934 HE w/ M734 Fuze	C379	1315-01-335-5016
XM930 Illum	C625	Not Released
M929 WP	C624	1315-01-343-1940
FUZES		
ITEM	DODIC	NSN
M734 Multi-option	N288	1390-01-268-7283
M776 MTSQ	Not Released	0000-00-900-8079
M935 PD	N342	1390-01-268-9155
M935 PD	N342	1390-01-245-8954
TRAINING DEVICES		
ITEM	DODIC	NSN
M880 Training Round	C876	1315-01-216-7070
M80 Refurbishment Kit	C045	1315-01-219-3936

Direction of fire can be relayed to the mortar section in degrees, mils or through graphics. The mortars will translate the direction of fire into deflection. Deflection refers to the gun tube orientation with respect to the direction of fire. Deflection is set as 2800 or 3200 regardless of direction of fire. For example, the troop commander calls for the mortars to set with gun tube orientation northeast. The mortars will refer to the direction of fire as 0800 mils. When they reach the given mortar firing point (MFP), the tracks will face about, and set their guns to the direction of 0800. Internally, they will set this direction of fire as the center deflection of 2800. Again, this is only in relation to the gun tube orientation. All calls for fire will be translated into deflection by the mortar section.

For planning purposes, the deflection range fan is common and quite helpful. Simply use an overlay sheet; draw a range fan with a centerline, and left and right limits. The left and right limits should be 45 degrees from the centerline, and the max distance should be 7,200 meters. Keep the range fan handy during the missions as the commander determines the indirect fire coverage from each mortar firing position.

Mortar sections set in a position and prepare to fire through three techniques: hipshoot, deliberate, and hasty occupation. A hipshoot mission is used for immediate suppression calls for fire. When the mortar section is moving and receives a call for fire, they must stop, put the guns into action, and fire the first round in less than four minutes with a 20 mil accuracy (according to the ARTEP standard). This is the most utilized and abused mission during cavalry operations. Troops should not be satisfied with 20 mil accuracy when given the opportunity to set the mortars in a MFP — consider that 20 mils at 1000 meters is approximately 200 meters off a determined target. Once the immediate suppression mission is complete, the mortars will improve their position and accuracy with the aiming circle.

A HE and WP mixture for immediate suppression will break the enemy's spirit and provide excellent suppression. This mixture provides 90 percent suppression for up to a 65m diameter, 50 percent suppression up to a 125m

diameter and only 10 percent up to 200 meters.

Deliberate occupations are time-consuming and tedious. With the recon of the MFP, setting the aiming circle, and occupying the position, the section could spend over 45 minutes before set. A hasty occupation, on the other hand, does not perform a dismounted recon, but takes the position by force.

With the aiming circle, a hasty occupation of a mortar firing point gives the unit a 2 mil accuracy of fires and the mortar section is prepared to fire in less than eight minutes (according to the ARTEP). The troop commander must plan and place MFPs throughout the sector to ensure the hasty occupations can occur.

Mortar firing points are determined and cleared using eight steps. When the scouts and the mortars work together, this process can be completed during a zone reconnaissance or a movement to contact. The eight steps are:

1. Does the tactical situation call for a MFP in that area?
2. Can the mortars range the designated targets with the $\frac{1}{3}$ - $\frac{2}{3}$ Rule? One third of the mortars' range should extend beyond the designated target area.
3. Can the mortars cover the target area from that position?
4. Does the MFP offer cover and concealed routes in and out of the position?

5. Do any existing structures (natural or man-made) mask fires and is there overhead clearance? A hilltop could mask fires and tree limbs block overhead clearance. In training, have the scouts elevate their gun tubes to the mortar's minimum elevation and mark that position. When clearing a MFP, the scouts can elevate their guns to that marked position to ensure the mortar fires are not masked. A protractor is also useful.

6. Is the position's surface condition conducive to track vehicles?

7. From that position, can the mortars maintain radio contact with the TOC, FIST-V, and commander?

8. Are there multiple covered and concealed routes to and from the positions?

It is clear the scouts can clear all mortar firing points before the mortars begin to occupy, and aid in maintaining the optempo for the troop.

From some positions, mortar sections can perform their own calls for fire and conduct their missions through direct lay. In this situation, the mortars range their targets and set their directions of fire. This method is quite useful in defensive operations and in flat land areas.

After setting a desired MFP, the mortar section calls for a ballistic meteorological message (MET message). The MET message enables the mortar sec-

tion to compensate for all nonstandard conditions. It contains data on air temperature, air density, wind speed, and weight of propellant and rounds. The message is initiated by the Field Artillery Target Acquisition Battalion and is sent to the squadron/battalion fire support officer (FSO). Once received, the FSO disseminates the MET via FM communication to the mortar section sergeant, who, in turn, compiles the data on a Ballistic MET Message form (DA Form 3675). The mortar squad leader then inputs the data into the MBC or manually completes the data on a MET Data Correction Sheet for Mortars (DA Form 2601-1). With either the form or the MBC, the squad leader can update the firing equipment to meet the necessary changes and conditions that affect the mortar round's flight. The MET message is received with the initial registration of rounds, and a second message should be sent four hours later to compute differences and update the equipment. The messages can be sent for each position, but a standard area message sent daily by the FSO will suffice for cavalry operations.

During zone reconnaissance, MFP locations and displacement criteria are dependent on tempo. Naturally, tempo is dependent on terrain-oriented or enemy-oriented zone recons. A terrain-oriented zone recon allows several MFPs to be set throughout the sector and gives the mortars time to displace to the next position. This ensures planned coverage of danger areas.

Enemy-oriented zone recons move faster than terrain-oriented, and change the displacement criteria of the mortar sections. Mortar firing points should be placed to cover danger areas and dis-



Art by SFC Michael Munoz

“Should the troop choose the indoor option, the mortar section can continue to train on the mortar ballistic computer, the plotting board, basic map reading, .50 caliber PMI, and conduct of the Fire Direction Center (FDC) exam....”

placement criteria should be understood by the mortar section before missions begin. This is an excellent opportunity for the scouts to clear the MFPs through sector.

Movements to contact call for hip-shoots more readily, but hasty occupations are preferred. The troop commander must plan carefully when placing and displacing mortars. Moving the mortars, for example, as the lead scout section reaches the line of contact is not wise.

For defensive operations, the commander must ensure routes in and out of MFPs are readily available and several are identified. The movements can be rehearsed and timed by the mortar section prior to contact, and rounds can be cached at each point. For example, cache illumination rounds for TRPs and CAS lanes in the initial position, and WP and HE mix in the last position for the final protective fire

(FPF). Screen lines are performed in the same manner.

Cache points are simple and often overlooked. The unit can emplace any number of rounds at any number of points. Ensure the cache points are not obvious and camouflage is utilized. The mortar section prepares the rounds as soon as the cache point is verified and rounds are dropped. This will save time during the battle. Also, the mortars should prepare the points to be blown in place in case of emergency. This implies that C-4 and accompanying equipment must be supplied, and the mortar men must be trained in demolition.

Obstacles are often a source of contention, and breaching operations must be rehearsed. One step often considered late into the process is the “R” (reduce) in SOSR (suppress, obscure, secure, and reduce). Delay or impact fuze settings on HE rounds fragment concer-

tina wire, while a proximity fuze setting detonates mines with overpressurization. This reduction of the obstacle will aid in the breach before the breach force enters the enemy's kill sack. Naturally, mortar fire can also be used against possible enemy overwatch positions or as immediate and limited smoke on or around the obstacle.

The mortar smoke mission is by far the most misunderstood operation. From the scouts to the troop commander, a virtual hand wave is given in dealing with obscuration. The unit plans for 15 minutes of smoke, yet does not provide for it. Under the most favorable conditions (70 degrees F with a slight breeze), two WP rounds will cover a 100m by 40m area for 60 seconds.

Keep in mind, however, that WP rounds take 30 seconds to produce smoke after impact. Adding even a 10-mph breeze will double or triple the number of rounds for the same time and area. For example, 15 minutes of smoke in 50-degree temperature with a crosswind of 20 mph would require over 80 rounds. Given the space for WP rounds on a mortar carrier (24 vertically), this mission would be impossible to accomplish without a cache or immediate resupply.

TRAINING

Moving the rounds for any defensive or offensive operation is quite difficult. An LMTV holds approximately 100 rounds and a HEMTT holds approximately 300. A good technique is to provide each mortar section with a HEMTT or LMTV during training exercises. Also, practice the time it takes to upload and download rounds from a HEMTT, break down the rounds at a cache point, and move the HEMTT to and from the field trains for more rounds. This will provide realism in training and will change how the troop and the support platoon do business.

Other training techniques for the mortar section are conducted indoors, in the motor pool, or just outside the gates of the motor pool. Should the troop choose the indoor option, the mortar section can continue to train on the mortar ballistic computer, the plotting board, basic map reading, .50 caliber PMI, and conduct of the Fire Direction Center (FDC) exam. In the motor pool, the mortar sections can practice laying in the guns, placing the guns into ac-

tion, non-moving hipshoots, gunner's exams, dismounting the gun system, and aiming circle operations. Set the aiming poles in coffee cans filled with cement or sand. Sand in the coffee cans better simulates properly setting the poles, as the soldier must ensure the poles are leaning at exactly the perfect angle. Just outside the motor pool gates, the mortar section can enjoy a variety of operations, including deliberate and hasty occupations, hipshoots, all the training mentioned above, and M880 subcaliber rounds.

The M880 subcaliber training round is used in conjunction with the 81mm subcaliber insert. With ranges from 47 to 458 meters, and the fact it uses a very low powered 20 gauge shotgun shell (with no pellets), the M880 can be used almost anywhere. The round provides a flash, bang, and smoke signature on impact and is fired using the same equipment as a regular live fire. The rounds cost much less than 120mm rounds and misfires are handled easily with the use of a "boom box" and a hammer. The biggest complaint with the M880 is that the crews must refurbish their own rounds after firing. When all rounds are expended, the crews walk down range and recover the M880 body and fins. The refurbish kits contain all materials necessary to refire the M880 bodies, and if the body and fins are still serviceable, the refurb kit can be added in about 5 to 10 minutes per round. With over 100 M880 bodies and refurb kits, this could take several hours to complete. Nevertheless, after completing a few refurbis, the time will decrease as the crews develop confidence and proficiency.

For the cavalry troop leaders, it is important to become familiarized with the basics of the mortar sections. The leaders should get involved with the gunner's and FDC exams. Keep in mind that these exams are the mortar equivalent of the Tank Crew Gunnery Skills Test (TCGST). Just like the TCGST, the crews must be qualified before a live-fire exercise. Troop commanders and scouts should understand how to choose and clear mortar firing points. This helps secure the positions and the mortars will perform hasty occupations more readily. The mutual support is a simple circle; the scouts support the mortars so the mortars can support the scouts.

Supply should have the list of fuzes and rounds necessary to perform the missions. (Appendix A lists some fuzes and rounds.) The troop must remember that the "neat" things mortars can do are dependent on the fuzes available. In addition, plan in advance for smoke missions or the troopers will have a false sense of realism from the training.

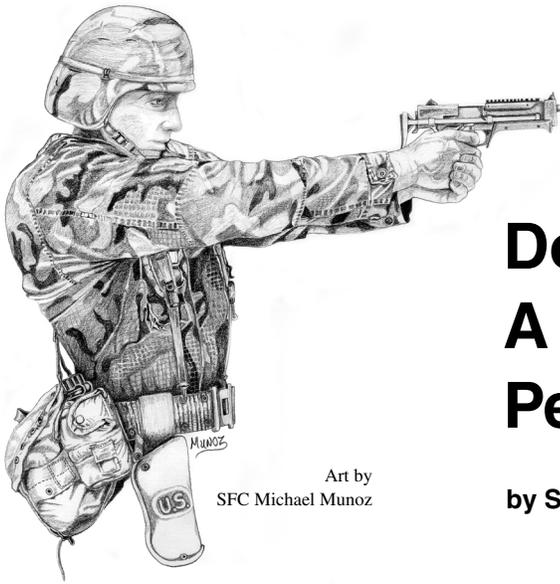
For the FOs, TCs, and BCs, perform calls for fire in training while observing the mortars. This shows exactly how much goes into a mission and how long it can take. Push the training a step further and have the mortars perform a hipshoot for the leadership of the troop, as this will be an eye-opening experience.

For the mortar section, do not accept the four-minute ARTEP standard for a hip shoot. A trained section can fire an immediate suppression mission in less than two minutes. Remember that the reason behind immediate suppression is trouble that was not expected, and four minutes is ridiculously long to wait for support. Also, do not accept the eight-minute ARTEP standard for a hasty occupation. As soon as the first vehicle stops, the section should take no longer than six minutes to secure the position by force, erect the aiming circle, lay in the guns, and fire the first mission. Train religiously on these tasks.

CONCLUSION

Remember the importance of the mortars. They are the troop's only organic indirect fire element, and as an integral member, should be trained to the troop standard. Understanding the support mortars provide during all operations builds a more succinct unit. Plan for their resupply, and do not settle for the hand-wave method of smoke operations. Use mortarmen, but use them correctly. Realism in training, no matter how painful in practice, will save lives on the battlefield.

1LT John Ives was commissioned in 1997 from New Mexico State University. He served as tank and mortar platoon leader in 1-72 AR, Camp Casey, Korea, and as a tank platoon leader, scout platoon leader, and troop XO in 1/3 ACR at Ft. Carson, Colo. Currently, he attends the Captain's Career Course.



Art by
SFC Michael Munoz

Do Armor Crewmen Need A More Effective Personal Defense Weapon?

by Stanley C. Crist

Armored vehicle crewmen, as well as many other military personnel, have a legitimate requirement for a personal defense weapon (PDW). For most of the 20th century, the PDW issued by the majority of the world's armies has been the semi-automatic pistol. The U.S. military has also followed this practice, initially with the .45 caliber M1911 Colt, and currently with the 9mm M9 Beretta.

Unfortunately, few pistol shooters can consistently hit targets at any distance much greater than point blank range, particularly when under stress. This effect has been observed by the author in civilian "combat" handgun matches, wherein only a small percentage of competitors were able to obtain multiple hits on targets at distances over 25 meters. It can also be seen in police shootings; law enforcement officers, who generally benefit from more range time than military personnel, nevertheless miss with about two of every three shots fired at a suspect! The primary reason that a handgun delivers so little combat effectiveness is a direct result of the poor stability afforded by the "firing platform." When holding a pistol in typical shooting stances, it is very easy to experience unwanted movement about the wrist, elbow, and shoulder joints. As can be seen in the switch from .45 caliber to 9mm, this problem can't be solved merely by a reduction in caliber.

A well-designed shoulder stock can make a decided difference, giving the

personal defense weapon a degree of firing stability approaching that of a rifle. During the First World War, some European service pistols were fitted with detachable shoulder stocks, but always with less than optimum results.

Detachable stocks do provide some improvement in the ability to achieve



The author's concept of the ideal personal defense weapon would be compact, lightweight, and have a high degree of commonality with the M9 Beretta. The artist's conception shown here has the telescoping stock in the retracted position.

Art by SGT Benjamin S. Ormand

hits with a pistol, but their design and construction is such that they tend to be difficult and time-consuming to affix to the weapon, especially when the shooter is under stress. A proper PDW should be built with an integral folding or telescoping stock that is configured for rapid and easy deployment.

Two such weapons are the .32 caliber Czech M61 Skorpion and the Polish PM63, which fires the 9mm Makarov round. The M61 was designed with a folding stock, while the PM63 stock telescopes. The compact size and light weight of these submachine guns enable them to be carried in a holster, a prime PDW requirement. Because of these traits, the M61 and the PM63 are the only "true" PDWs to be adopted by any of the world's armed forces. However, the combat effectiveness of both

weapons is hampered by their under-powered ammunition, which cannot penetrate modern body armor. But even 9mm NATO ball can be stopped by the soft body armor currently proliferating around the globe.

Because of the obvious limitations of conventional pistol ammunition, some

small arms manufacturers have developed pistols and submachine guns that fire small-caliber, high-velocity (SCHV) rounds. The diminutive bullets of the Belgian 5.7 x 28mm and German 4.6 x 30mm cartridges can easily punch through NATO-standard, titanium/Kevlar armor at distances of 150 meters or more.

There are two characteristics of the small-caliber weapons that may prevent their adoption on a large scale, however. One of these aspects — the possibly minimal stopping power of the featherweight projectiles — is the subject of an ongoing debate among forensic scientists.

The other drawback is the fact that the SCHV cartridges are much longer than the 9mm NATO round, thereby making



Penetration capability of current service pistols could be greatly increased by switching from standard 9mm ball ammo (left) to a hard-core, very high-velocity 9mm round (center), or a “necked-down” cartridge with reduced-diameter, lightweight bullet (right). Use of the latter would necessitate a barrel change, but should be compatible with 9mm magazines if the cartridge case is properly designed.

it impossible to convert existing 9mm weapons to the newer calibers.

Since most of the world's military forces have substantial investments in 9mm service pistols, adopting an SCHV personal defense weapon would either complicate the logistical equation or cause premature (and wasteful) disposal of the 9mm handguns before the end of their useful service life. And, while there is a definite requirement for a true PDW to arm some military personnel, there will almost certainly continue to be a need for a conventional handgun as the desired armament for other individuals.

The main advantages of the 4.6 x 30mm and 5.7 x 28mm cartridges are superior penetration and minimal recoil. But it is also quite feasible to produce 9mm loadings that will defeat Kevlar and similar materials, thereby increasing the combat potential of the M9 pistol. As a matter of fact, the Swedish company that developed the XM993 and XM995 armor-piercing, rifle/machine gun ammunition also created a 9mm “High Performance” (HP) round.

Although it slices through soft body armor like the proverbial hot knife through butter, the 9mm HP load has curiously not been adopted by the U.S. Army. Speculation in the popular press attributes this decision to the fear expressed by some legislators that military 9mm Kevlar-defeating ammunition might find its way into civilian hands. The rationale is that since 9mm handguns are readily available to criminals, this would pose a threat to law enforcement officers.

If this is, indeed, the case, there is another way to increase the penetration capability of the current sidearm, while minimizing the potential misuse by the criminal element.

This option is to use an improved cartridge that can feed from existing 9mm magazines, which would allow current 9mm weapons to continue to be utilized with perhaps no more than a change of barrels. There would be minimal impact on logistics, as existing stocks of 9mm ammunition could be consumed in training, to be gradually replaced with the high performance rounds. A ban on the manufacture and sale to civilians of ammunition (and, perhaps, barrels) in the new caliber should effectively eliminate the danger to police, while permitting the military to have more effective handgun ammunition.

The proposed cartridge would be similar in appearance to the 7.65 x 21mm round for which the famed Luger pistol originally was chambered, except the case would be sized for a bullet of different diameter to preclude firing in weapons chambered for the 7.65 Luger cartridge. An 8mm projectile would likely deliver the most stopping power, but a bullet of 7mm or smaller diameter would produce the best penetration and flattest trajectory. It should be possible to propel such a small-caliber, steel-core bullet at velocities well in excess of 2000 feet per second, thereby assuring easy penetration of the NATO titanium/Kevlar body armor.

Having covered the development of improved performance ammunition for the service pistol, the next issue that needs to be addressed is the design of a more effective personal defense weapon. To reduce the impact on logistics and training, the PDW should have the highest possible degree of commonality and interchangeability with the M9. At the very least, it should use the same magazines, and it would be very desirable to have the controls — trigger, safety, slide stop, and magazine release — operate the same as on the Beretta.

Probably the PDW should be made to function only semi-automatically, because of the relatively small magazine capacity and the fact that such compact, lightweight weapons are all but uncontrollable when fired in full-auto mode. At most, it might have two-shot burst capability, but only if it were demonstrated to provide a substantial improvement in hit probability. In that event, consideration should also be given to issuing the 20-round magazines manufactured for the Beretta M93R machine pistol (Note: these larger-capacity magazines will also fit the M9).

Barrel length of the PDW would have to be increased to at least six inches in order to have enough area ahead of the trigger guard for the supporting hand to grasp, and a tang would project downward at the forward end of the weapon to keep the shooter's fingers from slipping in front of the muzzle. A longer barrel will coincidentally increase velocity and reduce muzzle flash by allowing more complete combustion of the propellant prior to bullet exit.

A rapidly-deployable, telescoping stock would enable the weapon to be aimed and fired from the shoulder with good accuracy. If the situation warranted, the PDW could also be drawn from its holster and (with the stock in the retracted position) fired like the service pistol, especially if the Beretta's double-action trigger mechanism were retained.

Because this PDW concept is based on the M9 pistol, with which it is intended to share many components and design features, development time and expense should be minimal. Best of all, it should be able to meet all of the mission requirements regarding weight, holster compatibility, shoulder stock, magazine capacity, and armor penetration, making this almost the ideal personal defense weapon.

Stanley Crist served as a tank commander, tank platoon sergeant, training NCO, and scout section leader in the 3rd Battalion, 185th Armor. He has had numerous articles about armored fighting vehicle design published in *ARMOR* and other defense-related publications. He currently works as a consultant and writer, specializing in the testing and evaluation of small arms and ammunition.

OPERATION WESERÜBUNG

Inter-service Cooperation And Use of Combined Arms Led to German Success in Norway

“Not only bold, but one of the sauciest undertakings in the history of modern warfare.”¹

- Adolf Hitler

by Major Michael A. Boden

During the first three months of 1940, when the Second World War on other fronts was relatively quiet, German Chancellor and Führer Adolf Hitler ordered planning to begin for an invasion of Norway, Operation *Weserübung*. He came to this decision based on three overriding considerations: the German need to guarantee access to natural resources found in Scandinavia, the necessity of protection for Germany's "northern flank" during any future operations in the north, and the desire to continue the "siege of Britain," closing British access to the North Sea.² These operations offer many unique insights concerning military operations on both sides. This campaign was the first truly "joint" operation of the war, for both Germany and Great Britain. The Germans, in particular, relied on close cooperation between naval, air, and land forces in order to achieve their objectives. The sometimes strained relationship between these three elements led to a number of crises in command. Fortunately for the Germans, however, energetic leadership at all levels overcame these problems. Combat in the far north provided a new arena for military operations, which few had seen before. Finally, the nature of the terrain and sea lines of communications challenged the German logistical tail in ways foreseen but never practiced.

Of particular interest in the campaign was the Germans' use of combined arms warfare in their conduct of tactical maneuvers in the far north. This campaign represents an interesting window to glimpse the early methodology of fighting with small units — seldom larger than battalion size and often in an *ad hoc* constituency — to achieve limited objectives. By examining and evaluating the application and devel-

opment of combined arms operations during Operation *Weserübung*, the military professional gains insight into a fascinating but little-studied campaign in World War II, where soldiers found solutions to unique problems seldom faced during mechanized warfare in the years prior to 1940.

Although a lesser-known campaign, the German invasion of Norway saw the first use of paratroopers in combat, the first sinking of a warship by aircraft, and the loss of enough German warships to cripple its fleet for the rest of the war. The paratroopers were used to seize critical airfields around Oslo and Stavanger while 10,000 German troops hidden in merchant ships landed at Oslo, Bergen, Kristiansand, Trondheim, and Narvik. The German successes on the first day were tempered by the loss of the cruisers *Blucher* and *Karlsruhe*, and another cruiser, the *Konigsberg*, fell victim the following day to British naval aircraft. At the strategic level, this loss of three of the German Navy's eight cruisers (along with the loss of ten of her twenty destroyers) during the Norwegian campaign prevented Germany's fleet from interfering with the evacuation of Allied troops from Dunkirk two months later.

The Norwegian campaign itself consisted of four different realms of activity. On April 9, 1940, Germany began the actual conquest of Denmark and Norway, and by the 13th had occupied all of its initial objectives. In response to the invasion, the Allied powers, primarily Britain and France, with a small Polish contingent, countered this German move by conducting landings in Norway to oppose the German effort. By the 3rd of May, however, German

forces had defeated all of these landings, except for the one farthest north, at Narvik. From April 24 until May 26, the Allies conducted a slow, methodical effort to dislodge the Germans from this position. In the end, this effort failed, not so much because of German resistance (the Allies had a six-to-one advantage in manpower by the end of May) but rather because of the German invasion of France, which had occurred on May 10. From that point on, the Allied effort needed to be shifted to the fight in France. The final aspect of the campaign was the naval campaign, which saw the Germans achieve a Pyrrhic victory. The Germans retained the ability to position forces where needed, and to maintain logistical supply by sea until the necessary air bases were established, but at the cost of over half of Germany's overall surface fleet.

There were three particular instances where the German advantage in the application of combined arms proved of unique interest in the campaign. First, during the preparations for the campaign in general, when German commander General Nikolaus von Falkenhorst made a conscious effort to dedicate the necessary troops and equipment to the campaign, while the Allies took no such action. Second, during the German link-up effort between Trondheim and Oslo when German efforts proved superior, both qualitatively and practically, to their counterparts. It was here where the German preponderance in available combined arms units proved decisive for their ultimate success in the campaign. And third, during the fighting above the Arctic Circle at Narvik, where the Allies employed armor of their own against the German defenses with mixed results.

During the initial planning for the campaign, the Germans proved far more adept at using their available resources and units to prepare for the coming campaign. True, the German planning figures were constantly revised by the senior leadership of the *Oberkommando des Heeres* (OKH, the German Army High Command) and the *Oberkommando der Wehrmacht* (OKW, the German Armed Forces High Command). But in all of these revisions, one constant factor remained the idea that the forces would consist of different types of units that would effectively operate together. For instance, during the first attempt to create the force structure for the operation, in early February, 1940, naval Captain Theodor Kranke proposed an effort consisting of one airborne division, one mountain division, one motorized rifle brigade, and six infantry regiments. On top of this, the effort would be aided by significant bomber and fighter support.³

Four weeks later, when Hitler's directive finalized the troop dispositions, the force structure had changed somewhat, but still contained substantial elements of the major ground branches of service. The operation would include five infantry divisions, one mountain division, four batteries of 10 cm and two batteries of 15 cm guns, one tank detachment (*Panzerabteilung 40*) consisting of between 40 and 50 Mark I and II tanks, two companies of railway troops, a communications battalion, and three parachute companies.⁴ For the simultaneous invasion of Denmark, the Germans employed two infantry divisions, one motorized rifle brigade, and two separate companies of tanks.⁵ Finally, the operation called for the early seizure of different airfields in the country in order to provide land-based air support to German operations, emphasizing the importance of air power in this operation.⁶

To counter this, the Allies projected very little in the way of mechanized forces. Even though the British began their planning for the operation later than the Germans, their plans reflected very modest consideration to the necessary force structure that could prove successful against the German contingent. The British expeditionary force for Norway contained no anti-aircraft or anti-tank guns. No British aircraft accompanied the troops to Scandinavia.⁷ In addition, Norway's standing army was also short of such equipment, with no anti-aircraft guns or armored

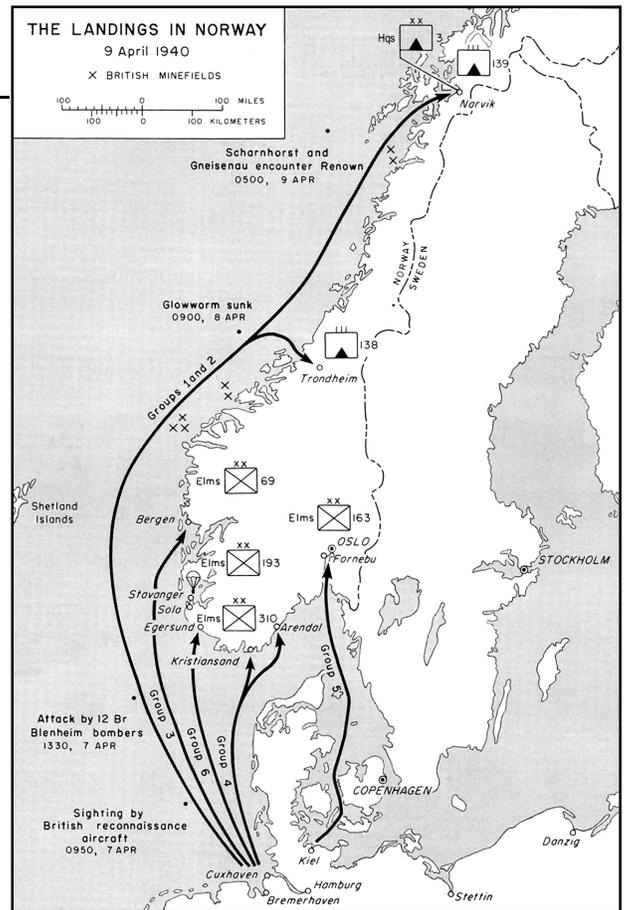
vehicles. The Norwegian air force was minuscule, including little more than one hundred planes, many of them caught on the ground without fuel in the surprise of the invasion.⁸

The Germans initiated the fighting with the objective of taking as many of Norway's main population centers as possible during the first days of the operation, then linking their forces in the following weeks.⁹ In the first few days of the operation, this approach proved very successful. German forces seized all of the main centers of resistance within the first few days of *Weserübung*. In Denmark, resistance to the German advance lasted less than three hours, subdued primarily by the actions of the armored and airborne troops.¹⁰ In many of the early airborne landings in Norway itself, such as at Stavanger and Oslo, German paratroop units backed up by air power and infantry battalions brought in by the *Luftwaffe* achieved early success.¹¹

Following this initial seizure, the German units developed their plans to link up. The one location where particularly hard fighting occurred was the mountainous terrain between Trondheim, on the North Sea, and Oslo. It was in this vicinity that the British expeditionary 148th and 15th Brigades and Norwegian 2nd Division (between 5,000 and 6,000 men) operated against a German advance of two divisions (roughly twice as large as the Allied force). Here, the Germans developed loose tactical procedures that proved quite effective at using all available assets in order to defeat the Allied detachments. The British realized they were outnumbered and out-equipped by their adversaries, and therefore decided against a pitched battle. Instead, they attempted to delay the advance as much as possible and tie the Germans down in the mountains until an Allied effort could be brought against Trondheim, or even Oslo.¹² The fighting in such conditions developed into a very consistent pattern:

"...the Norwegians based their defense on a series of roadblocks and barricades supported by flanking fire from the heights. The German answer, which proved highly effective, was to employ reinforced infantry spearheads organized in order of march as follows: one or two tanks, two trucks carrying engineers and equipment, an infantry company with heavy weapons organized into assault detachments, a platoon of artillery, a relief infantry company, relief engineers and artillery. In action the technique was to bring a roadblock under heavy frontal fire while ski troops attempted to work their way around the defenders' flanks."¹³

For the most part, these tactics worked successfully. The Germans, recognizing this success, made a determined effort to push their assets into this drive as it progressed, mostly to the north out of Oslo.¹⁴ They also discovered that Norwegian and British anti-tank defenses were ineffective against armor. At Tretten, on April 23, the British established a viable defensive position, but could man it with no more than two infantry companies armed with nothing heavier than four medium machine guns and one mortar. When the German tanks appeared, the British had nothing that could penetrate their ar-





German armor employed in Norway was similar to these tanks photographed during the earlier invasion of Poland. Here, a Pzkw I, foreground, acts as a command tank for the Pzkw IIs in the background. Both light tanks, they were armed with machine guns and in the case of the Pzkw II, a 20mm automatic cannon.

mor, and the position quickly fell.¹⁵ The terrain certainly did not support swift, mounted operations, but even in battles where the British were able to knock out a German tank or two, the proper German application of the other combined arms proved overwhelming. Two days later, at Kvam, after the Germans lost two tanks and an armored car in an assault, the combined effects of aircraft strafing and bombing attacks, artillery bombardment, and machine-gun fire again caused the position to fall.¹⁶ The British battalion commander, Major Cass, commented on the engagement after the campaign:

“First came three tanks and about 50 lightly-equipped infantry. Behind came more infantry on foot, motorcyclists, machine guns mounted in sidecars and towed guns. Behind again came motor vehicle after motor vehicle — lorries [trucks] full of infantry, wireless trucks, tanks, tracked carriers, guns, and many others. It was a target that gunners would dream about — three-quarters of a mile of confined road, crammed with troops and vehicles, all clearly visible from the observation post. Just one battery of 25-pounders could have blown the enemy off the road, but the nearest approach to artillery was the little anti-tank guns. All that could be done was to wait until the enemy came within rifle-shot.”¹⁷

The one small, tactical success the British attained during this fighting withdrawal occurred at Otta on the April 28, where German air and artillery attacks failed to dislodge the British defenders, at the cost of three tanks. But by that time, however, the final orders for retirement had been issued,

and the British retreated to the north unhindered.¹⁸ On May 1, converging German forces established contact between advancing elements from Trondheim and Oslo. Fittingly, the unit effecting the link-up was one of the *ad hoc* combined arms formations, Group Fischer, consisting of three infantry battalions, two artillery battalions, one engineer battalion, two motorized companies, one motorized machine gun company, and two platoons of tanks.¹⁹

The conditions were reversed to some extent in the far north, at Narvik. The Narvik operation, however, demonstrated that while the possession of a proper force mix acts as a great combat multiplier, the proper understanding of how to use such a force is critical for maximum success. At the height of the fighting at Narvik, in late May, the Allies had a manpower advantage against the Germans by approximately a factor of six (24,000 to 4,000). As further combat multipliers, the Allies also possessed superior naval gunfire support and had a section of ten light French tanks. The Germans could counter this with a fair amount of air support, as well as one battery of artillery.²⁰

The French operations with tanks met with mixed success. In their first employment, at the landing at Bjerkvik, on May 12, five of the French tanks made it ashore and began “frisking around like young puppies, firing all the time.”²¹ With the aid of the tanks, the French advanced and captured the towns of Bjerkvik and Elvegaard, destroyed a number of machine gun positions, and captured a significant quantity of supplies and material. This marked the high point of Allied com-

bined arms during the campaign, as the tanks specifically were cited for their effectiveness against the German positions. Additionally, the operation uncovered a number of challenges in the way that tanks, as well as other combat units, conducted amphibious operations. Depending on the type of ship that carried the tanks, and the subsequent offloading capabilities, some of the tanks were unloaded quickly, while others were unloaded far behind schedule.²² Regardless of some of these problems, however, the fact remained that the Allies achieved success in the first landing of troops under fire in the war.²³

The next attempt, the landings at Narvik on May 28, was far less noteworthy and did not achieve as clear a victory. While the Allies certainly did achieve success, little of it can be credited to a balance of forces. The Allied landing, conducted against a tremendously outnumbered defending force, had the support of large amounts of French and Norwegian artillery and naval gunfire, which proved effective. The two tanks involved in the landing never got off the beach (whether put out of action by mines or by the terrain is uncertain) and played no role in the fight.²⁴ Ten days later the Allied forces left Narvik, failing to defeat the German defenders. The German success in France made the operations in the far north obsolete and not worth the effort.

The employment of combined arms and structuring of forces in the Norwegian campaign had some impact on the future development of both German and Allied forces during the remainder of the war. On the German side, Operation *Weserübung* represented the first time that all branches of the military participated in a single operation; an operation of this type had not been contemplated previously.²⁵ While at the higher levels of command, this led to problems of coordination, German leaders at the tactical level proved adept at being able to shape the force structure in order to achieve the best possible results, through the use not only of army forces, but also of *Luftwaffe* and naval assets. The German army used similar *ad hoc* unit tailoring frequently and with much success throughout the war.²⁶ Additionally, the campaign demonstrated to the Germans, as well as to the British, that under certain conditions superior air power could defeat superior naval power.²⁷

On the Allied side, many other lessons from the Norwegian campaign figured prominently in future operations. The campaign, consisting mainly of small unit actions such as those discussed above, demonstrated a number of shortcomings that sobered the attitude of the British high command. These shortcomings included deficiencies in armor, artillery, automatic weapons, signaling equipment, maps, arctic training, and amphibious operations.²⁸

When the British, in particular, went into battle given these deficiencies, there were frequent cases of improper employment and ineffective troop organization, leading to dispersion of forces in the face of a far stronger enemy. As one observer commented, the campaign demonstrated to the British the “folly of sending [a] purely infantry force to fight against a force of all arms.”²⁹

Taken together, these observations well support Hitler’s claim, cited above, that this was a campaign that was “not only bold, but one of the sauciest undertakings in the history of modern warfare.”³⁰

Notes

¹Earl F. Ziemke, *The German Northern Theater of Operations, 1940-1945*, (Washington, D.C.: Department of the Army Pamphlet, 1959), 109.

²Ibid., 4-7.

³Ibid., 15.

⁴J.L. Moulton, *A Study of Warfare in Three Dimensions: The Norwegian Campaign of 1940*, (Athens, Ohio: The Ohio University Press, 1967), 62; and Ziemke, 33. The 3d Mountain Division had seen combat in Poland, all others were new to combat.

⁵Ziemke, 35. The tanks were Mark I and Mark II.

⁶Gerhard L. Weinberg, *A World At Arms: A Global History of World War II*, (Cambridge: Cambridge University Press, 1994), 117.

⁷Carl Joachim Hambro, *I Saw It Happen in Norway*, (New York: Appleton-Century, 1940), 80.

⁸Ibid., 161, 173.

⁹Ziemke, 27.

¹⁰Ibid., 59.

¹¹Ibid., 52, 49.

¹²Ibid., 69.

¹³Ibid., 72-3.

¹⁴Ibid., 70.

¹⁵T.K. Derry, *The Campaign in Norway*, (London: Her Majesty’s Stationery Office, 1952), 112.

¹⁶Moulton, 195-6; Derry, 121.

¹⁷Moulton, 195.

¹⁸Derry, 127-8.

¹⁹Ziemke, 74-5.

²⁰Derry, 197-8; Ziemke, 88, 92, 46. Much of the German heavy weaponry was lost on the seaward passage.

²¹Moulton, 199.

²²Derry, 198-9.

²³Moulton, 225.

²⁴Moulton, 225-8; Derry, 210-1.

²⁵Ziemke, 14.

²⁶See the German defense of Sicily, particularly the activities of *Kampfgruppen Schmalz*, and the German defense of Berlin for later examples of this force tailoring.

²⁷Ziemke, 111.

²⁸Derry, 240-2.

²⁹Moulton, 201.

³⁰Ziemke, 109.

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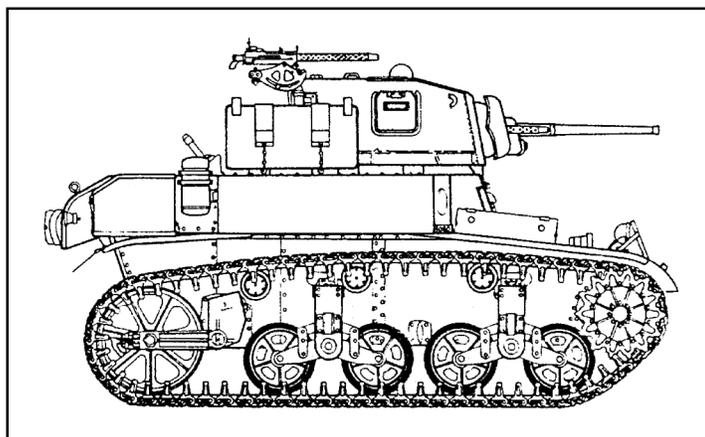
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Rare Stuart Light Tank Discovered in Haiti Jungle Will Go to Army Museum in Europe

An M3A1 Stuart light tank, trailing 60 years of history, recently made its second voyage to Europe, this time to the museum of the 1st Armored Division, which employed it in combat during WWII.

The tank was discovered in 1994 in a jungle clearing near a military camp in Haiti. Although severely rusted, the tank was essentially complete, although the breechblock of the tank had been removed and some road wheels were missing. Apparently, the M3A1 had been part of "Baby Doc" Duvalier's army, the Haitian Defense Force. It was parked near the Haitian Army's *Camp de Application* and was found by a U.S. Special Forces team. Jim Speraw, a Center for Military History museum specialist, identified the tank and realized that it was unusual.

This tank and several others were acquired from Haiti for use in U.S. military museums and were held at the CMH's Artifact Clearing House branch at Anniston, Alabama. Originally, the M3A1 was to be displayed by a Minnesota reserve unit, but was diverted to the 1st Armored Division museum in Baumholder, Germany because this model had played an important part in the division's history, according to Speraw. When the 1st Armored invaded North Africa in 1942, its M3A1s were victorious in combat against Vichy French tanks near Oran, Algeria, but as the war progressed, the tank's thin armor and inadequate gun power relegated it to scouting duties.



The particular history of the 1st AD's vehicle indicates that it was transferred from U.S. stocks to a European country after the war and was later purchased by Haiti.

Before its return trip across the Atlantic, the tank was reconditioned in Italy by the Ferrari Motor Car Company, most famous as a builder of some of the world's fastest, sleekest performance cars.

Daniel Peterson, director of the 1st AD Museum, said the tank will be completely restored to its original 1942 configuration and painted to represent a tank of Co. B, 1st Armored Regiment, 1st AD. This distinctive paint scheme

included yellow bands and stars and a large American flag. The flags were included in 1942 in the hopes that Vichy French forces in North Africa would not fire on Americans, but when they did, they were destroyed. The French lost 14 E35 light tanks in the engagement near Oran.

Three days later, the French troops surrendered and the French joined the Allies.

The Military Traffic Management Command moved the rusted tank from the States to Antwerp, Belgium, where it was transferred to a river barge by the 838th Transportation Battalion, for onward shipment to Baumholder.

A total of 3,427 of these tanks were built, and 2,433 of them were given to allies, including the British and the Chinese fighting the Japanese.

Contributors to this article included John Randt, Mike Bellafaire, John Slee, Martin Weteling and 1LT David Key of the MTMC, with photos by Karel Philipse and Wolfgang Scherer.



Back to the Basics

Maintaining a Training Focus Amid Current Distractions and Deployments Is a Leadership Challenge in Itself

by Captain Mike Henderson

“Keep it simple, because simple is hard enough.” - CPT Eastman, Commander, A/4-37 Armor 1993

In the Army of the 21st century, one subject seems to be at the forefront of discussions from private to President of the United States. That subject is operational tempo or OPTEMPO, a subject hotly debated among politicians and soldiers alike. The Army’s leadership is working to determine ways to better compensate troops in order to improve retention and recruiting, so OPTEMPO is on everyone’s mind. However, leaders at the company level and below feel that authority and discipline are being sacrificed for retention and recruitment, and that Better Opportunities for Single Soldiers has taken a more prominent role than basic soldier discipline and training.

This article’s purpose is not to solve OPTEMPO issues or to advocate a closed society that only deploys its military in the event of total war. Rather, I hope to offer food for thought on how we, as an Army, should get back to the basics. In this time of frequent deployments, low operational budgets, and recruiting challenges, it is time to get back to the basic fundamentals of soldiering.

In my short ten years in the Army, I’ve served in three TO&E units, in Korea, at Fort Riley, and at Fort Hood. Each unit did some things well and other things not so well. One problem each unit shared was training distracters, which turned into excuses not to conduct training or to train on a much-reduced scale. Of the three units that I served in, I worked for five different battalion commanders, with five different leadership styles. Each had his strengths and weaknesses, but the commanders I felt were most effective were the ones who emphasized training and



Art by
SFC Michael Munoz

“Hold small unit leaders accountable when soldiers fail to qualify, while recognizing those leaders whose squads and crews exceed the standards....”

reinforced this with a constant command presence at training. Consequently, those who were present for training were the ones who best reduced the impact of outside training distracters.

A basketball coach once told me that a team should conduct as many drills as possible handling the ball; it’s a philosophy that I subscribe to. If you command a tank company, your soldiers should spend as much time on a tank as possible, mastering the automotive system, the digital system, and the fire control system. If you command an infantry company, your soldiers should

master their assigned weapon and the equipment associated with that weapon. This philosophy is not earth-shattering, but if you ask a few soldiers and leaders if they spend enough time doing what they signed up to do, I’m sure many would answer “no.”

I offer the following suggestions, none original, all learned from past leaders. These are the most effective unit training techniques that I took away from the units in which I’ve served. I’ve broken them down into random categories where I think they fit and provide a benefit.

“...We do not have enough time to attempt to get fancy. If we master the basics, execute violently, and kill what we shoot at, then we’ll be successful....”

Basic Soldier Discipline

1. Conduct drill and ceremony training for 30 minutes weekly right before sergeant’s time (because we are soldiers and this is a great method to develop junior leaders).

2. Conduct guard mount when applicable (i.e. motor pool guard, EPA detail, AHA guard, or when pulling post red cycle duties). The leader can assign one soldier more than the tasking requires and reward the sharpest soldier with a day-off and/or a battalion coin.

3. Conduct daily in-ranks inspections, again with recognition of the best soldier in the group.

4. Conduct semi-annual Class-A inspections, followed by payday activities, but re-inspect those who don’t meet the standard.

5. When soldiers realize that they will be recognized for meeting or exceeding tough standards, they become warriors of excellence instead of mediocrity, and junior leaders feel that they are making significant contributions to the unit. When excellence is the norm, it becomes infectious throughout the entire organization and the unit polices itself at the lowest level.

War-Fighting Skills/Readiness

1. Roll a platoon no-notice during command maintenance. Issue a five-paragraph operations order and task them to conduct maintenance and MOS training in the field for a day. Supervise and perform spot-checks, but let the platoon execute with some autonomy.

2. Ensure soldiers master their weapons when they go to the range, instead of familiarizing to check the QTB block. This means that leaders are present and concurrent training is well-planned and supervised. Hold small unit leaders accountable when soldiers fail to qualify, while recognizing those leaders whose squads and crews exceed the standards.

3. CTT training is frequently an after-thought but important. Brigades and battalions must make a conscious effort to plan resources and protect this vital training. CTT is another opportunity for junior leaders to excel. The most en-

joyable times that I had in command were the days when NCOs were training soldiers in the fundamental skills of being soldiers and tankers.

Lane Training

Lane training should focus, especially at the platoon level, on the basic battle drills and the seven forms of contact. We do not have enough time to attempt to get fancy. If we master the basics, execute violently, and kill what we shoot at, then we’ll be successful.

The chain of command must be the evaluators of lane training, and leadership at all levels must be held to high standards of performance. All units will make tactical mistakes, but some tasks must be executed to standard all the time. For example, units must LD on time, must execute assembly area procedures correctly, and must be ready to move at stand-to. These tasks are based on discipline and there should be consequences when they are not done to standard.

TACSOP Revision

How many times have you as a tank platoon leader or tank company commander been asked by an O/C at a combat training center for a copy of your standard operating procedures? How many times has your answer been that it is currently “under revision”? How many times as a leader have you thought to yourself, “Man, I’d better get the SOP rewritten or just plain written before we begin our NTC train-up”?

I’m sure that 90 percent of the Armored Force can answer yes to at least one of the three previous questions. Now ask yourself, why? Wouldn’t a uniform tank platoon and company TACSOP, Army-wide, make more sense than someone spending valuable time to rewrite or create a new TACSOP, therefore reducing the confusion when task organization takes effect across task force and perhaps brigade and division boundaries?

Who will the proponent be? No one, these documents already exist. Remember the small green platoon and company SOPs that were handed out during the Basic Course? Those should be standard across the board, as should

the scout platoon SOP. The only document we need to create is something for the medium-weight platoons and companies.

The information published in *FKSM 17-15-3* is doctrinally sound. Perhaps a few items require revision, i.e., from my copy (Feb 91), the CSS portion, in reference to ammo, the changes to up-graded equipment like IVIS log-on procedures, and load plans for the M1A2. As we enter the new operational environment, we’ll have to make some additions/deletions to *FKSM 17-15-3*, but they should be minimal. Operating standards for Stability and Support Operations (SASO) should be added, and tasks such as running hasty checkpoints, vehicle and personnel search, and reaction to a mine strike should be included in an SASO annex to the SOP. Unit commanders should not rewrite or create new TACSOPs; it’s a waste of time. Why force platoons and companies to learn a new SOP when AOB and ANCOC use *FKSM 17-15-3* as the standard training document?

I don’t mean to lecture; I’m as guilty as the next person of failing to make the most of my time as a commander, but as many will agree, you really don’t know how to be a commander until you pass the guidon to your successor. I merely want to advocate to the force that, in this time of change, we can still maintain our fighting edge and tough discipline in spite of the high OP-TEMPO, red cycles, and periodic lack of funds. The training opportunities are out there, but we as leaders must concentrate hard to find those openings, and our senior leaders must protect us from any outside influences because even the simple things are hard.

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Chasing the Mythical Commander's Week

by Captain Chris L. Connolly

"What are you guys doing for your Commander's Week?" one company commander asks a group of other COs.

"Yeah, right," comes the cynical response from another seasoned commander. "You know how it is around here. Something always comes up at the last minute that will tube your training." Four heads all nod in agreement.

"I hear you," agrees the first commander. "I've planned a commander's week three times in the last year and have yet to actually execute one."

One of the more common complaints from a tank company commander, past or present, is the lack of control over the training calendar. With so many events dictated from higher that require support from the company, the plate becomes too heavy for a company commander to plan and resource his own training event.

In addition, training dollars are tied to OPTEMPO miles and too often it is easier to just let the tanks sit and wait for a battalion- or brigade-level event before anything rolls. When you add in tank services and red cycle support (and here on Fort Hood that can sometimes wipe out two to three *consecutive* months), many company commanders, myself included, throw up our hands in frustration at our inability to plan and resource training the way we were taught in the advanced course.

The FORSCOM commander's direction that all company commanders be afforded the opportunity to conduct a week's worth of training each fiscal quarter merely exacerbates the problem, creating a dilemma for brigade and battalion S3s.

As it is, tank companies in the armor community struggle to accomplish this directive. The primary reason is that current doctrine for training the force, *FM 25-100*, "does not compute" in today's training calendars. Instead of selecting a task to train from the METL, cross-walking it, and then trying to squeeze it into the calendar, company commanders must now start with what days are even available for

training and plug in "pre-packaged" crew-level training events that capture what is important for a tank crewman or crew to know.

To combat this, two changes need to be made:

- Higher headquarters needs to understand the limitations and constraints at company level
- Company commanders have to break the conventional wisdom of using *FM 25-100* as the basis for planning training

How can this be accomplished? Well, as stated, some of the help must come from higher headquarters. When every division- and brigade-level commander and staff must have his Warfighter Exercise, the inevitable new equipment test (like FBCB2, TUAUV, or BCIS), the obligatory CTC rotation, and the myriad of organizational days, training holidays, and taboo weekend training, what is left on the calendar is often slim pickings for the company commander's own training. Factor in gunneries, tank services, and block leave, and there is little wonder that our NCOs are frustrated about their own lack of input on the training schedule! Even a company commander can count on fewer than 14 white days ANNUALLY (come look at my 2000-2001 calendar)! Therefore, division and brigade planners must be careful of what is placed on the calendar and the far-reaching implications that it will have as far down as the company level.

A typical 5-day work week is not as it seems. Monday is command maintenance, a battalion event. Thursday is supposed to be Sergeant's Time and Family Time (go home at 1500). Friday at 1200 everyone starts to clean up the motor pool. In a perfect world, this leaves you Tuesday, Wednesday, and a partial Friday for company-directed training; and some of that should be spent preparing for Sergeant's Time. When one starts applying red cycle support, barracks maintenance, tank parts that need to be installed, the many meetings and "voluntary lunches" that find their way into the week, it is no

wonder that 18 company commanders in one room all laughed at the FORSCOM IG when he asked if we were conducting Commander's Week Training and Sergeant's Time. We need help from higher at policing the calendar, and we haven't been getting it.

To be fair, the other half of the solution is up to the company commander. Granted, opportunity is limited, but we must re-look how we plan our training. Conventional wisdom (*FM 25-100*) has training being planned based on a T, P, U assessment of a unit's METL. Commanders then select the task(s) to focus their training on. The selected METL task is then cross-walked down to the individual level and forms the basis for company-directed training.

In reality, today's unit training calendars rarely support this method at the company level. Too often, the only way to train platoon tasks or evaluate crew collective tasks are within battalion training events, such as gunnery or platoon lanes. National Training Center OCs stress that their environment is really an opportunity for commanders to assess what needs to be trained at home station and how to do it better. Unfortunately, the "hows" often do not take into consideration the training calendars handed down from division through battalion. Besides, right or wrong, most units approach an NTC rotation as an *end state*, not as a step within a continuous cycle of sustainment training. Once the rotation is over, frequently within three months, units turn over almost 50 percent, commanders change out, and the organization starts all over towards preparing for DRB or the next rotation 18-24 months away.

What a typical tank company needs is not the cumbersome METL crosswalk model. A company commander doctrinally does not train his own METL tasks or evaluate the training of his platoons; this is accomplished at battalion and brigade level. Instead, the company commander must simplify his training needs by focusing on what he is able to resource and evaluate and what will, ultimately, make him suc-

successful on the battlefield. So let's start at the bottom: As commanders, we often stress to our platoon sergeants and tank commanders to focus on the 20-25 individual tasks that are essential for trained individual tankers. In fact, if these 20-25 specific tasks are all captured in routine training events that typically populate a training calendar, you might have a short list like the following:

1. Weapons Qualification (M9/M4/M16)
2. Vehicle PMCS
3. TCGST
4. Driver's Training
5. Combat Lifesaver Course
6. NBC/CTT
7. Physical Fitness
8. Deployment Readiness

I think that most will agree that if PFC Smith has received training in these areas, he is an asset to the tank crew even if he receives no additional crew- or platoon-level training. Individual training must be second nature to a company. All a commander should need to do is identify the timeframe during the calendar year when he wants these accomplished. By specifying to the company that this quarter's focus is individual training, NCOs should be free to run with that guidance. Any available "white day" becomes an opportunity for a platoon to zero M4s, do driver's training, TCGST, or other individual training captured within an event.

We should also look at ammunition and range management. Companies are held virtually hostage by agencies that control ammunition. I must forecast ammunition one year out for a range that I am unable to lock down until five weeks out. NCOs should be allowed to forecast and plan individual small arms qualifications for their crews and platoons, not beg with CVC in hand for 100 rounds of 9mm to qualify three soldiers. The calendar today is far too cluttered to effectively execute company-level small arms qualification. Turn this and other individual training over to first-line NCOs.

Often, a unit is in the middle of a red cycle. Does it make this difficult? Assuredly. But remember that this is *individual training*, and one sergeant and two enlisted soldiers can accomplish M9 qualification or zero their M4s in 2-

3 hours. Too often, units look for the "AIT" set-piece approach to individual training, run by senior NCOs and officers. Hold those SGTs and SSGs accountable for individual stuff. Just afford them the time to do it, even if it is one crew at a time.

These simple building blocks, planned, resourced, and executed by first-line NCOs will assist in allowing the officers to direct their planning elsewhere... towards crew- and platoon-level events three to six months in advance.

I have thought long and hard about crew-level tasks. What I have discovered within my own company is that if a tank crew can do four to five basic things, it will be successful on the battlefield. Whatever the case may be, all a company commander should have to do is maneuver his platoons to a point on the battlefield where they can successfully maneuver their tanks to positions where the tank commander either wins or loses the crew fight. In numerous platoon and company operations, both here at Fort Hood and at the NTC, I have come to believe that, ultimately, a tank company wins or loses on the quality and skill of tank crews, not on the prowess of its platoon and company officers.

So what do your tank crews need to know to be successful on the battlefield? Perhaps it looks like this:

- Tank crew prep for combat (maintenance and equipment readiness)
- Tank crew gunnery (Tables IV-VIII, UCOFT, target acquisition)
- Tank crew maneuver (reaction drills and navigation)
- Casualty evacuation
- Alternate crew events (peacekeeping, STAB OPS, etc.)

Not only are these five "events" relatively simple to package into 3-5 day training event models such as crew STX lanes, but a quick cross-walk will show that these crew-level tasks captured in an event will support virtually any METL that a company develops. Preparation, shoot, move/communicate, and saving lives will ensure that our tank commanders and crews are better trained than the enemy's. It makes it much easier for a commander to maneuver forces knowing that his tank crews have all their (well-maintained!) equipment, can move quickly and kill

at 3000+ meters, and if necessary, reduce casualties incurred by injury. The capper is that these events can form the basis for a company's own TACSOP because they can be revisited quite often. Let's face it: the only things that belong in a TACSOP are those drills that a unit can reasonably expect to train time and again. The only time I saw a platoon attempt to "punch left" was at NTC. A complex platoon in-stride obstacle breach "play" may be out of place in a TACSOP when the platoon has only been able to run the play once in the last 18 months, one NTC rotation ago, and two platoon leaders in the past. What is "standard" about that play? Might as well carry *FM 17-15* around and save the time it took to put your own cool-looking SOP together.

And really, the company commander does not need to expend much energy with planning platoon or company training. Above crew level, the tank company is only *executing* battalion and brigade events. This is because external assessment is necessary at platoon and company level and, essentially, battalion and brigade commanders have the same philosophy regarding platoons and tank companies: Having well-trained platoons and platoon leaders means that they can maneuver companies with confidence, knowing that lethal platoons will carry the battle. Their staff plans and resources the events and provides external assessors. The company commander executes on the ground, but it is training managed at a higher level. These managed training events might boil down to these common three:

- Platoon prep for combat (PCIs, Platoon PMCS University)
- Platoon battle runs (A Table XII that is more LFX than just a gunnery table)
- Platoon maneuver (battle drills, TACSOP drills)

Platoon lanes and Table XII battle runs will always find their way onto the calendar. And for every NTC train-up, brigade runs the show, bringing it all together with company lanes and task force ARTEP-level training.

Now that the company commander has a short list of pre-planned event models that capture the essential individual and crew skills, how does he plan his training for the year? First, he has to know toward what goal he is

training. Is it an upcoming NTC rotation, which will invariably have platoon-through-task force lanes already built into the train-up, or is it a DRB focus in which stability operations and deployment-specific skills must be exercised at the crew level at some point? Second, and most difficult, he has to know what the training calendar can support from quarter to quarter. Here is a real-world example:

1st Brigade, 4th ID (M) assumes DRB on 1 November 2001. 3-66 AR is tagged as the first DRF 1 unit. Backing up 13 months, company commanders begin to look at where higher HQ have placed events on the calendar and then plan their own training to support the short-term higher event without losing sight of the long-term goal; in this case, DRB.

For FY01, 1st QTR (Oct-Dec), the commander knows he is in a maintenance-intensive period that includes tank MWOs and tank services. His focus becomes individual training, such as weapons qualification and TCGST, with perhaps a round of CCTT for leader command and control training. This is planned, resourced, and executed at the NCO level. Available "white days" are automatically given to platoon sergeants for weapons qualification, drivers training, CLS, and TCGST. December 15 is the completion date. NCOs now exercise their planning skills to incorporate the maintenance requirements and the individual training requirements. The commander begins focus on 2nd QTR training and conducts OPDs with the officers in preparation for 2nd QTR events.

For FY01, 2nd QTR (Jan-Mar) the battalion has scheduled gunnery in February (Crew Event #2) and platoon lanes in March (Platoon Event #2). Although the battalion is Division Red for January, the company commander plans a prepackaged crew-level event in conjunction with an OPFOR tasking in order to support these upcoming battalion events; in this case, a week in the field training tank crew maneuver (Crew Event #3) and crew preparation for combat (Crew Event #1). The company was fortunate to participate in another battalion's training event, which allowed it to get out of division red cycle support.

For FY01, 3rd QTR (Apr-Jun), the brigade assumes corps red cycle for

two months and also must accomplish tank services. (Don't ask me how we got into that predicament... go ask the G3. In my opinion, armor battalions should schedule tank services before **anything else** is placed upon the calendar, including NTC and DRB. For tankers, maintenance should be king of the training calendar). After several meetings of cursing, the commanders realize that they have little choice but to focus on individual events until June, when the corps red cycle ends.

Once again, NCOs must take the lead here, planning and executing this training to allow the commander to plan 3-6 months out. This is extremely tough, so the commanders direct NCOs to support red cycle tasks first and tank services second. Incredibly, and without dropping a single red tasking, NCOs complete at least some CLS training and weapons qualification while the commander and his platoon leaders work OPD skills and begin constructing the next crew-level training events. Since the battalion has Level I gunnery (Platoon Event #3) scheduled at the end of June, the commander can plan another crew-level event at the end of this quarter, specifically, another round of prepackaged lane training in order to sustain crew proficiencies in the basic skills (Crew Events #1, 3-4).

Finally, for the 4th QTR (Jul-Sep), after recovering from Tank Table XII, the commander can shift focus to DRB specific training. A day of stability operations training conducted by station (Alternate Crew Event), some rail and pallet loading training; NBC certification — even CTT. By the end of the 4th QTR, the commander is back to sustaining individual training and finishing the maintenance requirements necessary for DRB.

Is it sexy? Not really... but since most company commanders bounce in and out of command between 12-18 months, it seems prudent to have these event models already prepared for the next guy to refine and place within the training calendar.

For a battalion, 12 months towards DRB will have included the following **platoon** events:

- Two tank crew gunnery qualifications (February/July)
- Two platoon lanes (March/August)
- One DEPEX (June)

For the company, you have trained the following **crew** events:

- Three crew STX lanes (January/June/August)

For the noncommissioned officers, you have trained the following **individual** events:

- Sergeant's Time (year-round)
- Physical fitness (year-round)
- Deployment readiness (year-round)
- Two TCGST/driver's training (December/May)
- One CTT/NBC training (August)
- Deployment specific training (August)
- Continuous small-arms qualification, CLS, PMCS (year-round)

Further, the individual training is planned, resourced, and executed by the NCOs within the company, the crew events are planned and resourced by the company officers and executed by the NCOs, and the platoon events are planned and resourced by battalion and executed by the commander and his platoon leaders.

Is this a solution for every tank company? Perhaps not. But the principles behind putting it together remain surprisingly the same. All units must train to get somewhere, be it DRB, CTC, or something else... even in 4th ID, where "something else" had been the norm for too long! Instead of constructing an event from the METL and then trying to squeeze it into the calendar, commanders must start at the calendar first and then choose from a kit bag of "prepackaged" training events that can be supported by the cluttered calendar of today's over-tasked army.

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Breaking the Reconnaissance Code

by Captain Eric B. Shaw

Recent articles about the optimum design for cavalry vehicles — big or small, wheeled or tracked, heavily armed or stealthy — are fine questions, but for today's scouts who must fight with what they have, irrelevant ones, this author's emphasis is on the functions of scouting. — Ed.

Scouting is an art form that is developed and honed into a finely tuned instrument over a period of time. Also, I believe that the most obvious is being overlooked. We are asking ourselves the wrong question. "What vehicle design and make-up does a scout need to accomplish his mission?"

As leaders, I think we should be asking ourselves how can we get more out of the scout platoon as it is currently designed with its organic equipment.

Presently, our scouting techniques and methods are very good. The platforms that carry our scouts into battle are some of the best in the world. While we are not in dire need of a new scout vehicle, we are in dire need of our leaders being properly trained to employ the present vehicles in an austere environment. Over the past 15 years, the armor community has fought within itself to decide what is best, the Bradley-based Cavalry Fighting Vehicle (CFV) or the High Mobility Multipurpose Wheel Vehicle (HMMWV). As of today, we are no closer to answering this riddle than we were ten years ago, prior to Desert Storm. As we did in Desert Storm, we will do the same for the next big conflict — fight with what we've got. More than likely, the design for a new scout vehicle will not be approved prior to the next war. Therefore, let's not hinder ourselves by discussing the design flaws and inadequacies of our present platforms and ask instead how we can better accomplish our mission with the tools at hand.

Looking at ARTEP 17-57-10-MTP, Mission Training Plan For The Scout Platoon, the missions of the HMMWV and CFV scout platoons are the same. Depth, frontages, duration of observation posts, and other collective tasks are the same. The expectations of a 19D, Skill Level 1 through Skill Level 4, remains the same no matter what type vehicle he is assigned. So why do scouts

in HMMWVs have trouble meeting their reconnaissance requirements at the National Training Center while scouts mounted in CFVs tend to do a lot better, and vice versa, at the Combat Maneuver Training Center in Hohenfels, Germany? It all comes down to three areas: training, terrain, and time.

Terrain. A scout platoon's mission, enemy focus, troops available for the operation, and time to complete all necessary tasks are the same. The terrain is the only element of METT-T that has a significant impact on the outcome of a scout platoon's mission. While assigned to the 1st Battalion, 4th Infantry Regiment (OPFOR) in Hohenfels, Germany as a scout platoon leader, I saw first-hand how the terrain impacted on wheeled and tracked reconnaissance vehicles.

HMMWV scout platoons were able to maneuver through the heavily vegetated areas. They could move along small trails very rapidly and stay off the main tank trails. With their winches, HMMWVs could self-recover and continue the mission. This allowed the HMMWV scouts the opportunity to maneuver closer to their assigned objective.

CFVs, on the other hand, would remain mired until another like vehicle recovered them or until they died. Bradley scouts could not conduct adequate reconnaissance within the maneuver box and would die before the main battle began. The CFV was too large to get too far off the main tank trails; scouts would remain mounted on the vehicle, bump into an obstacle and die, or stumble around throughout the night looking for a bypass. With our great ability to turn night into day, the ideal time to conduct reconnaissance is at night. Thermal capabilities gives the CFV a distinct advantage over the HMMWV, but this advantage is neutralized by the vehicle's noise. As a scout on an OP, I did not need to see a CFV at night but only listen for its roar as it struggled to traverse the wooded terrain of Germany. Bottom line: in heavily vegetated terrain, the CFV scout has difficulty conducting mounted reconnaissance.

In a totally different environment (NTC), the tables are turned; the Brad-

ley scouts are very adept at conducting reconnaissance and security operations. The open terrain at the National Training Center is more user-friendly to CFVs than the more confined terrain of Germany. At the NTC, and in similar terrain, the mounted cavalry scout with his 42-ton monster is more likely to survive than his counterpart in the HMMWV. The desert offers limited areas for scouts to hide their vehicles. In the desert, HMMWV scouts spend more time running from the OPFOR than conducting reconnaissance and security operations. Because of the desert's limited concealment, vehicle survivability is highly essential. The thin skin of the scout HMMWV makes it a lucrative target of opportunity for the OPFOR. The CFV, on the other hand, has the ability to take a hit, return effective fire, and continue the mission, so the CFV performs better as a desert environment scout platform.

Training. After comparing the performance of the two vehicles designed for identical missions, training levels become a factor. BLUFOR scouts tend to die early and often at the Combat Training Centers. The reason I emphasize BLUFOR is because OPFOR scouts tend to survive on the battlefield. We all know that they live in that environment and know all the best places to hide. That's the advantage of playing in your own backyard. I doubt the United States Army will fight a conventional war in Pinyon Canyon or on any other piece of real estate within our borders anytime in the near future. So let's move on to what we do know. The next time scouts are deployed into combat will more than likely be in a foreign country and very few of the scouts will have any combat experience. Fighting in someone else's hometown is our business.

The one critical component that separates a dead scout from a live breathing one is **technique**. OPFOR and BLUFOR scouts are trained at the same school. They are all 19Ds and their missions are the same, reconnaissance and security. So why do OPFOR scouts seem to perform their missions so much more effectively? The answer to this is simple, *they are afraid to die*. The OPFOR scout is outgunned and his night-fighting capability is limited. So as an

OPFOR scout, he is forced to use skills learned at the Armor Center. Instead of using his platform as a reconnaissance vehicle, it is used more as a battle chariot. The OPFOR uses the vehicle to get him to the desired location, which is normally out of listening range of the BLUFOR, where he then dismounts and begins his reconnaissance. Our BLUFOR scouts tend to ride their vehicles to their death. Our scouts have PLGRs, improved thermal sights, better weapon systems, and a myriad of intelligence support from higher. What they lack is the will to wage war and do their job the proper way. They become creatures of comfort. Instead of dismounting and calling the vehicle forward after the bend in road is cleared, our scouts would prefer to drive around the bend only to discover a BMP at the ready.

Training and repetition is what makes the OPFOR so good. Each rotation for the OPFOR scouts at the CTCs is another opportunity to hone their already sharpened skills. This is a huge advantage that our BLUFOR scouts only get once a year, or twice if they are lucky. While stationed at CMTC as a scout platoon leader for the OPFOR, everything was kept very simple. There was never anything fancy about the way we conducted business in the field. The goal was to sneak, peek, report, and not be seen. I think we can all agree that, in a nutshell, that is what all scouts should do. With the assistance of the battalion commander and his staff, the majority of our scout platoons are highly trained. The skills that will assist the platoon in surviving at the CTCs and in combat will rely heavily on the platoon leader and the ability of the senior NCOs to effectively teach and train the proper techniques of reconnaissance.

Time. As we all know, conducting reconnaissance is a slow and methodical process. Scouts must be provided the time to accomplish their mission. Many of our scouts die prior to the main body crossing the line of departure because we, as leaders, did not provide them with enough time to accomplish their mission. In order to provide the necessary time leaders must have a good understanding of what a reconnaissance or security mission requires. A good scout will tell you that he can clear a zone at a rate of one kilometer per hour, which is good walking speed. An injustice is served when the zone is 5km wide and 10km deep and the platoon has only 4 hours to complete the task. The platoon leader is forced into a situation that decreases the chance of

Scout Training Plan

The following 10-day training plan is a simple guideline that will help leaders focus on the essential elements needed on the battlefield. This training plan can be conducted in any sequence. Simplicity is the key.

DAY ONE: Map reading

Training should initially focus on basic map reading skills, then progress to more advanced skills, i.e., orienteering and polar plots.

DAY TWO: Land Navigation

Training should focus on both mounted and dismounted navigational skills with day and night iteration.

DAY THREE: Patrol Techniques

Training should focus on two- and three-man buddy team techniques. Training should conclude with scouts conducting dismounted recon of an objective (night).

DAY FOUR: Radio Procedures

Training should focus on proper radio net procedures, SOI usage, secure net operations as well as frequency hopping.

DAY FIVE: Buddy Aid

Training should focus on immediate buddy aid that scouts may need to perform under limited supervision (sprains, small cuts, insect bites, dehydration, MEDEVAC procedures, marking LZs).

DAY SIX: Observation Posts

The focus should be on identifying and establishing proper OP positions. Scouts should understand the importance of NFAs.

DAY SEVEN: Call for Fire

This training event works well when combined with mortar or artillery live fire exercises. Scouts learn to call for and adjust fire on enemy targets.

DAY EIGHT through TEN: AA procedures, TLP, maintenance, load plans, weapons qualification, and retraining.

These three days can be used in a variety of ways. The first seven days focused primarily on dismounted operations and procedures, the last three training days are focused more on platoon-level tasks.

* Each day should conclude with a test of the material covered and time should be planned to retrain personnel.

the platoon's survival. Many commanders say that the side that wins the recon/counterrecon fight will win the battle the next day. Nine times out of ten this is true. So, if the success or failure of the recon effort determines the fight, commanders may want to focus more attention and assets on reconnaissance and security operations.

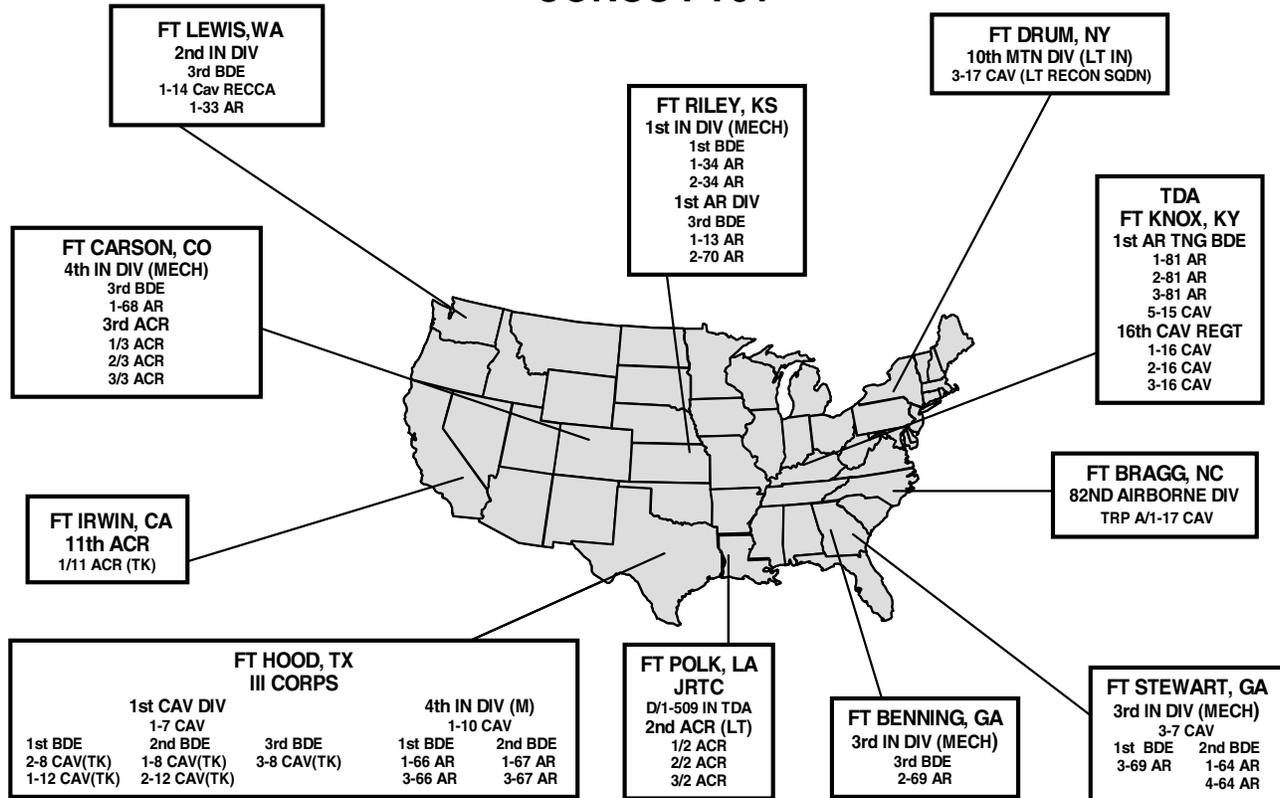
In conclusion, scouts are combat multipliers that we treasure dearly. They are also men we send into battle to determine the enemy's disposition. They are the young lieutenants, old platoon sergeants, and fiery young soldiers who try to do the best job they can each and every time they cross the LD. As leaders, we must be aware that they cannot accomplish their mission by themselves. It takes a team effort to prove to the world class OPFOR, and the world

itself, that our scouts are the best at what they do.

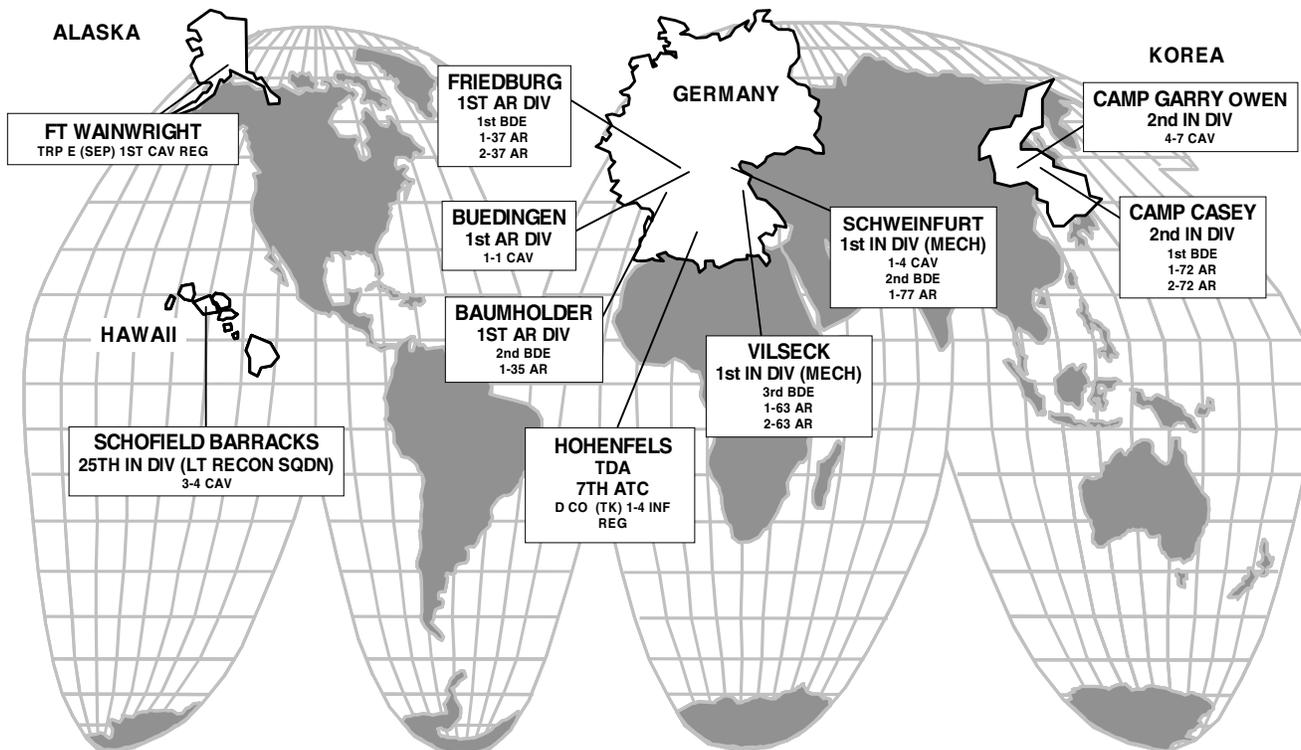
CPT Eric Shaw is a plans and exercise officer for First United States Army at Fort Gillem, Ga. A 1990 graduate of Fort Valley State University, he has attended AOB, JMOC, SPLC, AOAC, and CAS3, and holds an M.S. degree in health services from Central Michigan University. Previous assignments include tank and scout platoon leader and XO with 1st Battalion, 4th IN (OPFOR), Hohenfels, Germany; commander, C Company, 2/12 Cav, 1CD at Fort Hood, Texas; and senior armor trainer for the 4th Brigade, 87 Infantry Division (EX).

10 Division Armor/Cavalry Geographical Locations

CONUS FY01



OCONUS FY01



Active Component Units

Source: Office, Chief of Armor, Armor Proponency Division

<u>V CORPS</u>	<u>Unit</u>	<u>Location/APO/ZIP</u>	<u>DSN</u>	<u>Equipment</u>	<u>CDR</u>	<u>CSM</u>
1 AD	1 BDE	Friedberg, GE 09074	324-3821		COL M.S. Tucker	CSM Lucero
	2-37 AR	Friedberg, GE 09074	324-3238	M1A1/HMMWV	LTC G.F. Seiferth	CSM Smith
	1-37 AR	Friedberg, GE 09074	324-3140	M1A1/HMMWV	LTC T.S. James Jr.	CSM Kennedy
	2 BDE	Baumholder, GE 09034	485-7493	(IN CSL)	COL J. Johnson	CSM Doucet
	1-35 AR	Baumholder, GE 09034	485-6368	M1A1/HMMWV	LTC R.E. Douglass	CSM Taylor
	1-1 CAV	Buedingen, GE 09076	321-4884	M1A1/M3A2	LTC M.A. Bills	CSM Cooke
	DIV CAV			3 GND X 2 AIR		
	2 BDE	Schweinfurt, GE 09226	353-8728/8679	(IN CSL)	COL P.J. Palmer	CSM Beam
	1-77 AR	Schweinfurt, GE 09226	353-8648	M1A1/HMMWV	LTC W.H. Hedges	CSM Fourhman
	3 BDE	Vilseck, GE 09112	476-2791		COL P.A. Henry	CSM McLane
1-63 AR	Vilseck, GE 09112	476-2527	M1A1/HMMWV	LTC P.T. Warren	CSM Peters	
2-63 AR	Vilseck, GE 09112	476-2748	M1A1/HMMWV	LTC S. MacFarland	CSM Houston	
1-4 CAV	Schweinfurt, GE 09226	353-8602	M1A1/M3A2	LTC J.H. Chevallier	CSM Rose	
DIV CAV			3 GND X 2 AIR			
8TH ARMY	1 BDE	Camp Casey, Korea 96224	730-2770		COL J.E. Martz	CSM Tong
	1-72 AR	Camp Casey, Korea 96224	730-4998	M1A1/HMMWV	LTC C.E. Queen	CSM Zettlemoyer
	2-72 AR	Camp Casey, Korea 96224	730-2229	M1A1/HMMWV	LTC R.R. Naething	CSM Keithley
	4-7 CAV	Camp Garry Owen, Korea 96224	734-2862	M1A1/M3A2	LTC W.V. Hill III	CSM Brown
	DIV CAV			3 GND X 2 AIR		
PACOM	3-4 CAV	Schofield Bks, HI 96857	315-456-9340	HMMWV	LTC T.J. Hansen	CSM Bennett
	LT RECON SQDN			1 GND X 2 AIR	(AV CSL)	
25 ID	3 BDE	Ft. Lewis, WA 98433	357-3709		COL S.L. Bailey	CSM Story
	1-14 RECCA Sqdn	Ft. Lewis, WA 98433	357-8532/7494	M1A1/HMMWV	LTC J.E. Cashwell	CSM Rilling
	1-33 AR	Ft. Lewis, WA 98433	357-3733	M1A1/HMMWV	LTC E.C. Audino	CSM Egan
	TRP E/1 CAV	Ft. Wainwright, AK 99703-6154	(317) 353-9655	HMMWV	CPT J.A. Coulon	SFC Gifford
DIV CAV						
I CORPS	LT RECON SQDN					

<u>III CORPS</u>	<u>Unit</u>	<u>Location/APO/ZIP</u>	<u>DSN</u>	<u>Equipment</u>	<u>CDR</u>	<u>CSM</u>
1 ID (M)	1 BDE	Ft. Riley, KS 66442	856-4014		COL J.M. Milano	CSM Finerson
	1-34 AR	Ft. Riley, KS 66442	856-5616	M1A1/HMMWV	LTC B. Howard	CSM Noble
	2-34 AR	Ft. Riley, KS 66442	856-9068	M1A1/HMMWV	LTC G.A. Brinegar	CSM Colangelo
	3 BDE	Ft. Riley, KS 66442	856-5014		COL J.B. Musser	CSM Hopkins
	1-13 AR	Ft. Riley, KS 66442	856-4511	M1A1/HMMWV	LTC M.P. Wadsworth	CSM Pring
	2-70 AR	Ft. Riley, KS 66442	856-5028	M1A1/HMMWV	LTC J.D. Ingram	CSM Skidmore
	1 BDE	Ft. Hood, TX 76546	737-0831		COL M.A. Ryan	CSM Hernandez
	1-12 CAV	Ft. Hood, TX 76546	737-0823	M1A2/HMMWV	LTC R.W. Forrester	CSM Lawrence
	2-8 CAV	Ft. Hood, TX 76546	737-3516	M1A2/HMMWV	LTC J.W. Davis	CSM N. Roberson
	2 BDE	Ft. Hood, TX 76546	737-6560/0702		COL M.R. French	CSM Ciotola
1 CD	1-8 CAV	Ft. Hood, TX 76546	737-0431	M1A2/HMMWV	LTC M.S. Bell	CSM Lee
	2-12 CAV	Ft. Hood, TX 76546	737-0683	M1A2/HMMWV	LTC J.F. Pasquarrette	CSM Rocha
	3 BDE	Ft. Hood, TX 76546	737-7092/3930	(IN CSL)	COL K.R. Wendel	CSM Boyink
	3-8 CAV	Ft. Hood, TX 76546	737-1968/1552	M1A2/HMMWV	LTC J.G. Singleton	CSM Small
	1-7 CAV	Ft. Hood, TX 76546	737-2811/9063	M1A2/M3A1	LTC P.E. Funk II	CSM Lightsey
	DIV CAV			3 GND X 3 AIR		
	1 BDE	Ft. Hood, TX 76546	738-2886/2840/8434		COL D.M. Campbell Jr.	CSM Wilson
	1-66 AR	Ft. Hood, TX 76546	737-3794/3837	M1A1/HMMWV	LTC B.T. Roberts	CSM Moody
	3-66 AR	Ft. Hood, TX 76546	737-3468/3456	M1A1/HMMWV	LTC L.A. Jackson	CSM Kaufman
	2 BDE	Ft. Hood, TX 76546	738-7502/2166		COL D.E. Rogers	CSM Bosley
1-67 AR	Ft. Hood, TX 76546	738-2083/5988	M1A2 SEP/HMMWV	LTC R. Valdivia	CSM Barnett	
4 ID (M)	3-67 AR	Ft. Hood, TX 76546	738-7096/5905	M1A2 SEP/HMMWV	LTC M.A. Young	CSM D. Roberson
	1-10 CAV	Ft. Hood, TX 76546	738-7797	M1A2 SEP/M3A2	LTC T.D. Martin	CSM List
	DIV CAV			3 GND X 2 AIR		
	3 BDE	Ft. Carson, CO 80913	691-5132/6755	(IN CSL)	COL C. Tucker	CSM Fuss
	1-68 AR	Ft. Carson, CO 80913	691-4567	M1A1/HMMWV	LTC R.G. Piscal	CSM Garrett
	3 ACR	Ft. Carson, CO 80913	691-6445		COL A.W. Harriman	CSM Hartzell
	1/3 ACR	Ft. Carson, CO 80913	691-5159	M1A1/M3A2	LTC W.T. Dolan	CSM Sweeney
	2/3 ACR	Ft. Carson, CO 80913	691-2952	M1A1/M3A2	LTC T.L. Green	CSM Caldwell
	3/3 ACR	Ft. Carson, CO 80913	691-8862	M1A1/M3A2	LTC W.D. Turner	CSM Thompson
18 ABN CORPS	1 BDE	Ft. Stewart, GA 31313	870-8655	(IN CSL)	COL V.K. Brooks	CSM Dunn
	3-69 AR	Ft. Stewart, GA 31313	870-4595	M1A1/HMMWV	LTC D.J. Bishop	CSM Hood
	2 BDE	Ft. Stewart, GA 31313	870-7663		COL D.G. Perkins	CSM Smith
	1-64 AR	Ft. Stewart, GA 31314	870-7643	M1A1/HMMWV	LTC D.B. Hain	CSM Barnello
	4-64 AR	Ft. Stewart, GA 31313	870-7690	M1A1/HMMWV	LTC P.D. deCamp	CSM Cockrell
	3-7 CAV	Ft. Stewart, GA 31313	870-7420	M1A1/M3A2	LTC T.R. Ferrell	CSM Frazier
	DIV CAV			3 GND X 2 AIR		
	3 BDE	Ft. Benning, GA 31905	784-4111	(IN CSL)	COL D.B. Allyn	CSM Kellman
	2-69 AR	Ft. Benning, GA 31905	784-2211	M1A1/HMMWV	LTC P.C. Bayer Jr.	CSM Fite

<u>Unit</u>	<u>Location/APO/ZIP</u>	<u>DSN</u>	<u>Equipment</u>	<u>CDR</u>	<u>CSM</u>
2 ACR	Ft. Polk, LA 71459	863-2060/0509		COL T.A. Wolff	CSM Gainey
	Ft. Polk, LA 71459	863-2502	HMMWV	LTC T.F. Lynch III	SGM Morris
	Ft. Polk, LA 71459	863-8206	HMMWV	LTC J.R. Armstrong	CSM Waters
	Ft. Polk, LA 71459	863-0884	HMMWV	LTC J.F. Sartiano Jr.	CSM Johnrow
82 AB DIV	TRP A/1-17 CAV	239-2930	HMMWV	CPT F. Park	1SG Morris
10 MTN DIV(LT)	Ft. Drum, NY 13602	341-9052	HMMWV 1 GND X 2 AIR	LTC T.A. Balish (AV CSL)	CSM Blackwood
<u>FORSCOM</u>					
JRTC	Ft. Polk, LA 71459	863-0467/0470	M551	CPT Bauguess (IN CSL)	1SG Reed
11 ACR	Ft. Irwin, CA 92310-5068	470-3499		COL H.M. Davis	CSM S. Flood
	Ft. Irwin, CA 92310-5068	470-3706		LTC T.A. Norton	CSM Noble
<u>TRADOC</u>					
1 ATB	Ft. Knox, KY 40121	464-6843		COL J.L. Ballantyne IV	CSM Green
	Ft. Knox, KY 40121	464-6345	M1	LTC M.D. Needham	CSM Washington
	Ft. Knox, KY 40121	464-2645	M1	LTC L.J. Verbiest	CSM Wilson
	Ft. Knox, KY 40121	464-1313		LTC S.J. Eden	CSM Davis
	Ft. Knox, KY 40121	464-8226	M3	LTC C.E. Honore Jr.	CSM Hester
16 CAV	Ft. Knox, KY 40121	464-7848		COL J.F. Antal	CSM Doan
	Ft. Knox, KY 40121	464-7965	(VEH. SPT.)	LTC M.W. Alexander	CSM Ashley
	Ft. Knox, KY 40121	464-6654	(AOB/SPLC)	LTC D.L. Bartlett	CSM Colter
	Ft. Knox, KY 40121	464-5855	(AOAC/CLC)	LTC E.S. Glascock	CSM Davis
			(PCC/BMOC)		

Marine Corps Tank Battalions

Source: U.S. Marine Corps Detachment – Fort Knox

<u>Unit</u>	<u>Parent Unit</u>	<u>Location</u>	<u>Phone/DSN</u>	<u>CDR</u>
1st Tank Battalion	1st Marine Div	MCAGCC, Box 788260, 29 Palms, CA 92277	957-6793	LtCol J.J. Bryant
2d Tank Battalion	2d Marine Div	Box 20091, Camp Lejeune, NC 28542	751-1851	LtCol M. Oehl
4th Tank Battalion (Reserve)	4th Marine Div	9955 Pomerabo Rd., San Diego, CA 92145-5295	577-8109	LtCol S.L. Dickey I&I LtCol R.M. Hanson
8th Tank Battalion (Reserve)	4th Marine Div	439 Paul Rd., Rochester, NY 14624-4790	(716) 247-3330	LtCol M.F. Campbell I&I LtCol J.F. Ahern
Marine Detachment Fort Knox		Garry Owen Regt. Rd., Bldg 2372, Fort Knox, KY 40121	464-5950	LtCol E.T. Dunlap

Army National Guard Units

Source: Office of the Special Assistant to the Commanding General (ARNG), Fort Knox

Divisional Brigades

	<u>Brigade</u>	<u>Division</u>	<u>Location</u>	<u>Phone</u>	<u>Fax</u>	<u>Commander</u>	<u>CSM/OPS SIM</u>	
1st Army	2nd Bde	28th ID	125 Goodridge Lane Washington, PA 15301-0020	(724) 223-4570	(724) 223-4426	COL M. Neeper	CSM T. Honkus	
	55th Bde	28th ID	900 Adams Ave. Scranton, PA 18510-1004	(570) 963-4558	(570) 963-3139	COL J. Gronski	CSM V. Conti	
	56th Bde	28th ID	2700 Southampton Rd. Philadelphia, PA 19154-1299	(215) 560-6010	(215) 560-6036	COL P. Catlin	CSM R. Curran	
	1st Bde	34th ID	107 E. Chestnut St. Stillwater, MN 55082-5115	(651) 297-4355	(651) 297-4453	COL N. Ostapenko	CSM S. Rannenburg	
	37th Bde	38th ID	5999 Airport Dr. NW N. Canton, OH 44720-1483	(614) 336-6040	(614) 336-6066	COL M. Kambic	CSM D. Thomas	
	46th Bde	38th ID	1200 44th St. SW Wyoming, MI 49509-4399	(616) 249-2741	(616) 249-2740	COL J. Leatherman	CSM J. Shiply	
	3rd Bde	42nd ID	27 Masten Ave. Buffalo, NY 14204-1097	(716) 884-2713	(716) 885-1439	COL A. Soeder	CSM R. Wishman	
	50th Bde	42nd ID	Bldg 3654, Florida & Saylor Pond Rd. Ft. Dix, NJ 08640	(609) 562-0608	(609) 562-0625	COL W. Finck	CSM R. Trainor	
	86th Bde	42nd ID	363 Fisher Rd. Montpelier, VT 05602-8904	(802) 828-2987	(802) 223-4936	COL E. O'Neill	CSM D. Labarron	
	5th Army	149th Bde	35th ID	2729 Crittenden Dr. Louisville, KY 40209-1199	(502) 637-1250	(502) 607-2650	COL A. Abel	CSM J. Carpenter
		2nd Bde	40th ID	7401 Mesa College Dr. San Diego, CA 92111-4997	(619) 573-7002	(619) 573-7019	COL J. Harrel	CSM R. Delaney
		3rd Bde	40th ID	240 N. 2nd St. San Jose, CA 95112-4017	(408) 277-9960	(408) 277-1902	COL K. Jones	CSM B. Mehninger
2nd Bde		49th AD	5104 Sandage Ave. Ft. Worth, TX 76115-3799	(817) 923-1010	(817) 924-7018	COL J. Johnson	CSM R. Brownlee	
3rd Bde		49th AD	1775 California Crossings Dallas, TX 75220-7098	(972) 556-0350	(972) 401-0610	COL D. Owens	CSM B. Hendry	
36th Bde		49th AD	15150 Westheimer Parkway Houston, TX 77062-1600	(281) 558-1742 ext. 3811	(281) 558-6206	COL E. Spurgin	CSM H. Rigsby III	

Separate Brigades

	<u>Brigade</u>	<u>Associated Div/Corps</u>	<u>Location</u>	<u>Phone</u>	<u>Fax</u>	<u>Commander</u>	<u>CSM/OPS SM</u>
1st Army	30th IN Bde (M) (eSB)	24th ID, XVIII Corps	101 Armory Dr. Clinton, NC 28328-9730	(910) 251-7227	(910) 251-7245	BG D. Hickman	CSM L. Morgan
	31st AR Bde		P.O. Box 210368 Montgomery, AL 36121	(334) 274-4283	(334) 274-4297	BG G. Quick	CSM J. Haney
	48th IN Bde (M) (eSB)	24th ID, XVIII Corps	P.O. Box 4848 Macon, GA 31208-4848	DSN 468-3319	(912) 751-6202	BG R. Rigdon	CSM W. Kegley
	155th AR Bde (eSB)	III Corps	P.O. BOX 2057 Tupelo, MS 38803-2057	(662) 891-9705	(662) 891-9701	COL(P) C. Woods	CSM G. Cowley
	218th IN Bde (M) (eSB)	24th ID, XVIII Corps	P.O. Box Drawer 280 Newberry, SC 29108-0280	DSN 583-1620	(803) 806-2040	COL L. Newton	CSM J. Sexton
5th Army	278th ACR (eSB)	V Corps	POB 10167, 3330 Southerland Ave. Knoxville, TN 37939-0167	DSN 921-3201	(865) 582-3208	COL M. Haston	CSM J. Pippin
	81st IN Bde (M) (eSB)	I Corps	1601 W. Armory Way Seattle, WA 98119-8175	(206) 378-6512	(206) 378-6599	BG R. Read	CSM A. Ohler
	116th Cav Bde (eSB)	I Corps	4650 Wellsworth St. Boise, ID 83705-8175	DSN 422-4659	DSN 422-4667	BG J. Cozine	CSM J. Reeves
	256th IN Bde (M) (eSB)	V Corps	1806 Surrey St. Lafayette, LA 70508-2016	DSN 863-1207	(318) 262-1422	BG J. Bascilica	CSM Hemphill

Units by State

<u>ST</u>	<u>Unit</u>	<u>Parent Unit</u>	<u>Address</u>	<u>Phone</u>	<u>Fax</u>	<u>Commander</u>	<u>CSM/OPS SM</u>
AL	1-131 AR	31st SAB	2301 US 231 S. Ozark, AL 36360-9470	(334) 774-8075	(334) 774-2858	LTC D. Speigner	CSM J. Haney
AL	E/31 CAV	31st SAB	P.O. Box 3 Sylacauga, AL 35150-0003	(256) 245-7551	(256) 245-8722	CPT J. McLaughn	1SG G. Vincent
AL	1-152 AR	31st SAB	5323 Airport Rd. Gadsden, AL 35904	(256) 442-8899	(256) 442-4966	LTC B. Blankinship	CSM H. McKinley
AR	E/151 CAV	39th SIB (L)	591 HWY 243 Marianna, AR 72360-9604	(870) 295-3355	(501) 212-7858	CPT D. Neugebauer	1SG G. Bradshaw
CA	1-185 AR	81st SIB (M)	266 E. 3rd St. San Bernardino, CA 92410-4897	(909) 383-4534	(909) 884-7753	LTC K. Lochner	CSM R. Reynolds
CA	2-185 AR	2nd Bde, 40th ID	7401 Mesa College Dr. San Diego, CA 92111-4997	(858) 573-7011	(858) 573-7040	LTC C. Schaubelt	CSM R. Pond
CA	1-149 AR	3rd Bde, 40th ID	140 Colonel Durham St. Seaside, CA 93955-7300	(831) 393-8407	(831) 393-8406	LTC C. Bradfield	CSM W. Clark
CA	1-18 CAV	40th ID	950 N. Cucamonga Ontario, CA 91764-2999	(909) 983-5998	(909) 983-1174	LTC A. Gutierrez	CSM M. Syzeek
FL	E/153 CAV	53rd SIB (L)	900-1 SW 20th St. Ocala, FL 34474-3517	(352) 732-1210	(352) 732-1211	CPT R.H. Cophart	1SG N. Melin

ST	Unit	Parent Unit	Address	Phone	Fax	Commander	CSM/OPS SM
GA	E/108 CAV	48th SIB (M)	1015 S. Hill St. Griffin, GA 30223-4858	(770) 229-3281	(770) 229-3282	CPT A.L. Wright	1SG D. Knowles
GA	1-108 AR	48th SIB (M)	P.O. Box 36 Calhoun, GA 30703-0036	(706) 624-1340	(706) 624-1341	LTC Roberts	CSM M. Thomas
IA	1-113 CAV	34th ID	3200 2nd Mech Dr. Sioux City, IA 51111-1348	(712) 252-4347	(712) 252-4348	MAJ T. Orr	CSM McCarty
ID	2-116 CAV	116th SAB	1069 Frontier Rd. Twin Falls, ID 83301-3371	(208) 422-7000	(208) 422-7411	LTC G. Thomas	CSM W. Nuttall
IN	E/238 CAV	76th SIB (L)	500 E. Spring St. Bluffton, IN 46714-3738	(219) 824-3328	(219) 824-3199	CPT M.T. Fichus	1SG R. Spade
KS	1-635 AR	2nd Bde, 40th ID	1709 S. Airport Rd. Manhattan, KS 66503-9795	(785) 539-0241	(785) 539-3487	LTC J. Andrew II	CSM J. Romans
KY	2-123 AR	149th Bde, 35th ID	920 Morgantown Rd. Bowling Green, KY 42101	(270) 338-8922	(270) 607-2250	MAJ S. Campbell	CSM R. Bogle
LA	1-156 AR	256th SIB (M)	400 E. Stoner Ave. Shreveport, LA 71101-4241	(318) 676-7614/ 7613	(318) 676-7616	LTC R. Johnson	CSM J. Mays
LA	A/108 CAV	256th SIB (M)	500 Fairgrounds Rd. Natchitoches, LA 71457	(318) 357-3195	(318) 357-3195	CPT C. White	1SG E. Relfford
MD	1-158 CAV	29th ID (L)	18 Willow St. Annapolis, MD 21401-3113	(410) 974-7400	(410) 974-7304	LTC P.A. Burke	CSM O'Connel
MI	1-126 AR	46th IN Bde, 38th ID	1200 44th St. SW Wyoming, MI 49509	(616) 249-2756	(616) 249-2740	LTC M. Nevin	CSM L. Ott
MIN	1-94 AR	1st Bde, 34th ID	4015 Airpark Blvd. Duluth, MN 55811-5793	(218) 723-4769/ 4756	(218) 723-4876	LTC M. Hoberg	CSM D. Jullin
MIN	1-194 AR	1st Bde, 34th ID	1115 Wright St. Brainerd, MN 56401	(218) 828-2392	(218) 828-2524	LTC R. Sackett	CSM D. Hanson
MS	A/98 CAV	155th SAB	2310 Hwy 15 S. Louisville, MS 39339-2310	(662) 773-5331	(662) 773-8583	CPT J. Cade	1SG Hollingsworth
MS	1-198 AR	155th SAB	P.O. Box 158 Amory, MS 38821-0158	(662) 256-3741	(662) 256-5066	LTC Journey	CSM K. Rogers
MS	2-198 AR	155th SAB	P.O. Box 278 Senatobia, MS 38668-0278	(662) 562-4494	(662) 562-4232	LTC R. Bolden	CSM G. Davis
MT	E/163 CAV	11th ACR	P.O. Box 4789 Helena, MT 59604-4789	(406) 841-3655	(406) 841-3658	1LT Westfall	1SG R. Kuiken
NC	E/196 CAV	30th SIB (M)	P.O. Box 265 Elizabethtown, NC 28337-0265	(910) 862-3242	(910) 862-3407	CPT L. Fedd	1SG J. White
NC	1-252 AR	30th SIB (M)	P.O. Box 64158 Fayetteville, NC 28306-0158	(910) 484-1849	(910) 484-5132	LTC C. Torrence	CSM A. McMillan
NE	1-167 CAV	35th ID	2400 NW 24th St. Lincoln, NE 68524-1892	(402) 471-7468	(402) 471-7229	LTC M. Melvin	CSM M. Jimerson
NJ	5-117 CAV	42nd ID	2560 S. Delsea Dr. Vineland, NJ 08360-7093	(609) 696-6702	(609) 696-6798	LTC S. Hines	CSM D. Kenna

ST	Unit	Parent Unit	Address	Phone	Fax	Unit Commander	CSM/OPS SM
NJ	2-102 AR	50th Bde, 42nd ID	550 Rt. 57 Port Murray, NJ 07865-9482	(908) 689-1068/ 1355	(908) 689-0403	LTC F. Duifer	CSM W. Kryscnski
NV	1-221 CAV	11th ACR	6400 N. Range Rd. Las Vegas, NV 89115	(702) 632-0505	(702) 632-0540	LTC Spitze	CSM H. House
NY	E/101 CAV	27th SIB (L)	300 Main St. Geneva, NY 14456-2698	(315) 789-0134	(315) 789-0229	CPT J. Richardson	1SG Steenberge
NY	1-101 CAV	3rd Bde, 42nd ID	321 Manor Rd. Staten Island, NY 10314-2498	(718) 442-8728	(718) 442-8607	LTC M. Costagliola	CSM F. Gillmore
NY	1-127 AR	3rd Bde, 42nd ID	27 Masten Ave. Buffalo, NY 14204-1097	(716) 884-3337	(716) 885-1439	MAJ(P) C. Pfeiffer	CSM W. Hines
OH	1-107 CAV	37th Bde, 38th ID	4630 Allen Rd. Stow, OH 44224-1038	(614) 336-6778	(614) 336-3782	MAJ J. Perry Jr.	CSM Whatmoughy
OH	1-147 AR	37th Bde, 38th ID	68 Shady Brook Dr. Cincinnati, OH 45216	(513) 761-2030	(614) 336-6586	MAJ R. Green	CSM L. Shank
OH	2-107 CAV	38th ID	2555 Countyline Rd. Kettering, OH 45430-1506	(614) 336-6064	(614) 336-6648	LTC R. Recchiuti	CSM D. Cain
OK	E/145 CAV	45th SIB (L)	319 E. Polk McAlester, OK 74501	(918) 423-0973	NA	CPT M. Harsha	1SG B. Schultz
OR	G/82 CAV	116th SAB	822 W. Highland Ave. Redmond, OR 97756	(541) 548-3213	(541) 548-1456	CPT E. Tanguy	CSM L. Stone
OR	3-116 AR	116th SAB	404 12th St. Lagrande, OR 97850-2802	(541) 963-4221	(541) 963-7865	LTC B. Keibler	CSM J. Brooks
OR	F/82 CAV	29th SIB (L)	350 W. Maple Lebanon, OR 97355-1936	(541) 451-5758	(541) 451-7602	CPT M. Wolfe	CSM L. Stone
OR	E/82 CAV	41st SIB (L)	1630 Park Ave. Woodburn, OR 97071-3333	(503) 982-1811	(503) 981-8523	CPT K. Pons	CSM L. Stone
PA	1-104 CAV	28th ID	5350 Ogontz Ave. Philadelphia, PA 19141-1693	(215) 329-2622	(215) 560-4169	LTC A. Gray	CSM M. Moretz
PA	1-103 AR	2nd Bde, 28th ID	565 Walters Ave. Johnstown, PA 15904-1298	(814) 533-2443	(814) 533-2611	LTC R. Sembower	CSM T. Wieczorek
PA	2-103 AR	55th Bde, 28th ID	900 Adams Ave. Scranton, PA 18510-1004	(570) 963-4644	(570) 963-3121	LTC R. Stankinas	CSM R. Schimelfenig
PA	3-103 AR	55th Bde, 28th ID	P.O. Box 291 Lewisburg, PA 17837-0291	(570) 523-3468	(570) 522-0560	MAJ(P) A. Schafer	CSM M. Dougherty
PR	E/192 CAV	92nd SIB (L)	PO Box 1152, Camp Santiago Salinas, PR 00751	(809) 824-0573	NA	CPT C. Noubert	
SC	B/202 CAV	218th SIB (M)	P.O. Box 1006 Beaufort, SC 29901-1006	(843) 524-4929	(843) 524-0720	CPT D. Mixon	CSM J. Sexton
SC	1-263 AR	218th SIB (M)	1018 Gilchrist Rd. Mullins, SC 29574-9317	(843) 464-8158	(843) 806-1036	LTC C. Murff	CSM J. Wiggins
TN	1/278 ACS	278th ACR	413 County Rd. 554 Athens, TN 37303-6420	(423) 744-2807	(423) 744-8304	LTC W. Honeycutt	CSM R. Goode

<u>ST</u>	<u>Unit</u>	<u>Parent Unit</u>	<u>Address</u>	<u>Phone</u>	<u>Fax</u>	<u>Unit Commander</u>	<u>CSM/OPS SM</u>
TN	2/278 ACS	278th ACR	4401 W. Stone Dr. Kingsport, TN 37660	(423) 247-2278	(423) 247-2399	LTC D. Adams	CSM N. Aldridge
TN	3/278 ACS	278th ACR	P.O. Box 2189 Cookeville, TN 38502-2189	(931) 432-4117	(931) 432-6252	LTC J. Gentry	CSM J. Kyle
TX	1-112th AR	3rd Bde, 49th AD	700 N. Spring Creek Pkwy. Wylie, TX 75098-6083	(972) 442-4679	(972) 442-4858	LTC M. Campsey	CSM R. Godfrey
TX	2-112th AR	2nd Bde, 49th AD	2101 Cobb Park Dr. Ft. Worth, TX 76105-2185	(817) 531-8737	(817) 531-3463	LTC C. Mitchell	CSM K. Boyer
TX	3-112th AR	2nd Bde, 49th AD	5601 FM 45 S Brownwood, TX 76801-9734	(915) 646-0159/ 8221	(915) 646-0340	LTC J. Thatcher	CSM D. Bunnell
TX	4-112th AR	36th Bde, 49th AD	1700 E. 25th St. Bryan, TX 77802-1305	(979) 822-9059	(979) 823-2995	LTC M. Alayon	CSM E. Chambliss
TX	5-112th AR	3rd Bde, 49th AD	2109 Warren Dr. Marshall, TX 75672-5512	(903) 938-4613	(903) 935-2428	LTC W. Meehan	CSM J. Ray
TX	1-124th CAV	49th AD	2120 N. New Rd. Waco, TX 76707-1098	(254) 776-1402/ 1821	(254) 776-5829	LTC J. Whitaker	CSM D. Swinson III
VT	1-172 AR	86th Bde, 42nd ID	St Armory, Fairfield St. St. Albans, VT 05478-1727	(802) 524-7904	(802) 524-7906	LTC M. Chesney	SGM M. Larose
VT	2-172 AR	86th Bde, 42nd ID	15 West St. Rutland, VT 05701	(802) 786-8800	(802) 786-8017	LTC P. Fagan	CSM K. White
WA	E/303 CAV	81st SIB (M)	622 4th Ave. SE Puyallup, WA 98372-3301	(253) 840-4670	(253) 840-4587	CPT D. Palmer	1SG C. Ulrich
WA	1-303 AR	81st SIB (M)	24410 Military Rd. Kent, WA 98032-4110	(253) 945-1831	(253) 945-1800	MAJ G. Abbot	CSM K. May
WV	1-150 AR	56th Bde, 28th ID	Bluewell Rural Station Bluefield, WV 24701	(304) 589-3361	(304) 623-6143	LTC C. Hicks	CSM B. Reed

TASS ARMOR BATTALIONS

Region

A	1st AR Bn, 254 Regt	P.O. Box 277 Sea Girt, NJ 08750-0277	(732) 974-5995	(732) 974-5975	LTC W. Walsh	CSM Dulfer
B	1st AR Bn, 166 Regt	Bldg 10-12 Ft. Indiantown Gap, PA 17003-5002	(717) 861-8240	DSN 491-2496	LTC P. Heron	CSM Heckel
C	1st AR Bn, 218 Regt	5411 Leesburg Rd. Eastover, SC 29044-9732	(803) 806-2401	(803) 806-2332	LTC R. Haggard	NA
D	1st AR Bn, 117 Regt	Bldg 638, Vol Tng Site Smyrna, TN 37167	(615) 355-3708/ 3640	(615) 355-3719	LTC J. Pippin Jr.	MSG R. Smith
E	1st AR Bn, 145 Regt	8208 S. Perimeter Rd. Columbus, OH 43217-5930	(614) 336-6443	(614) 336-6447	LTC D. Allen	MSG S. Mitcham
F	1st AR Bn, 131 Regt	P.O. Box 5218 Austin, TX 78763-5218	DSN 954-5158	(512) 406-6973	LTC B. Rankin	CSM L. Wesch
G	1st AR Bn, 204 Regt	5050 S. Junker St. Boise, ID 83705-8150	(208) 422-4850	(208) 422-4860	LTC B. Kelley	CSM D. Lerner

REVIEWS

Leadership: The Warrior's Art edited by Christopher Kolenda, Army War College Foundation Press, Carlisle, Pa., 2001, 437 pages, \$19.95 (softcover), ISBN 0-9709682-1-3.

"Personal experience [of leadership]," observes volume editor Major Christopher Kolenda in echoing the sentiments of General George S. Patton, Jr., military theorist Captain B.H. Liddell Hart, and others, "therefore, must be augmented by the records of others and synthesized by the insights of history, philosophy, and theory." To be sure, the purpose of this superb anthology, *Leadership: The Warrior's Art* — based upon the experience and insight of others — is to provide guidance and insight for aspiring or practicing military leaders to better understand their roles and responsibilities and become more effective.

This interesting volume consists of 19 mainly previously unpublished essays on various aspects of leadership written largely by former military figures (ranging in rank from major to retired full general) and civilian faculty members of the West Point departments of History, Social Sciences, and Behavioral Science and Leadership. As such, from a theoretical and academic — and in many cases a practical — perspective, the authors are experts in their fields and of their essay subjects. The study begins with a short foreword by retired General Barry R. McCaffrey, in which he places the essays within the overall context of leadership development, followed by an insightful introduction by Lieutenant General Walter F. Ulmer, Jr., U.S. Army (Ret.).

This anthology consists of three sections: "Ancient and Modern Concepts of Leadership," "Historical Case Studies," and "Contemporary Experiences and Reflections on Leadership." The first section (five essays) provides the foundation for the book by enumerating definitions, concepts, and theories of leadership. The essence of leadership, suggests Kolenda, is "to inspire the spirit and act of following regardless of external circumstances." The attributes and characteristics of leaders are further examined, as is the complex issue of evaluating leader effectiveness. Building unit cohesion, and the implications for doing so in the contemporary U.S. Army, and the role and importance of discipline in developing initiative, are also covered in the first section.

Section II, Historical Case Studies, consists of seven essays. These articles highlight the leadership and character of Alexander the Great and Frederick the Great; American military leader competence in World War I and an anatomy of "heroism under fire" in the Second World War; the ethical dilemma faced by General Curtis E. LeMay in the fire bombing of Japan; and perceptions of German Army unit excellence and of Soviet Army tactical initiatives. Whether one agrees with their respective conclusions or not, all of

these historical essays are well-written and interesting.

Seven essays are in Section III, Contemporary Experiences and Reflections on Leadership. This is perhaps the most relevant section of the study. Noteworthy in this section are "Charisma" by retired Brigadier General John C. "Doc" Bahnsen, and Colonel Robert W. Cone's "Battle Focused Training." These essays stress positive aspects of leader selection, training, and development, and the inculcation of the warrior spirit. It would have been perhaps even more worthwhile to read of realistic and honest solutions to the current *malaise* in the U.S. Army, the result of a lack of training and maintenance funds; frequent deployments on peacekeeping-type missions; rampant officer "ticket-punching" and blatant careerism; the prevailing (and destructive) "zero defects" environment; and a deterioration of professional ethics and of a sense of duty and responsibility.

Leadership: The Warrior's Art, living up to McCaffrey's commentary in the book's Foreword, provides "an enormous contribution to understanding how organizations can produce extraordinary success by building teams capable of heroic behavior." This interesting, thought-provoking, and intellectually challenging anthology is highly recommended to military and civilian readers — and especially to the Army's current senior officers as a reminder of the characteristics of and the need for genuine leadership in the Army today.

HAROLD E. RAUGH, JR.
LTC, USA (Ret.)

Lifting the Fog of War by Admiral Bill Owens with Ed Offley; Farrar, Straus and Giroux, New York, 2000, 263 pages, \$25.00 (hardcover).

Reflecting on Clausewitz's "fog of war," Admiral Owens wrestles with the uncertainty of the battlefield. To emerge from the "fog," he proposes a transformation in the way in which our military wages war. He argues that advances in space-based systems, communications, and computers are capable of giving commanders a real-time picture of the battlefield reducing, if not eliminating, uncertainty. *Lifting the Fog of War* embraces high technology to transform the military into a faster, lighter, and smarter force responsive to securing our national interests and transforming the way in which it wages war. This mantra reflects post-Cold War realities in which U.S. troops will fight swift regional skirmishes rather than set battles with heavy equipment.

Based on his service as Vice-Chairman of the Joint Chiefs of Staff, Admiral Owens offers uncanny insight to the inner world of service parochialism. He contends that the Department of Defense (DoD) is inefficient and archaic. He argues that the unified approach to weapons acquisition and force structure fails to preclude a defense trans-

formation removed from service parochialism. Moreover, ingrained in "jointness" is a bureaucratic resistance that has thwarted efforts to launch a Revolution in Military Affairs. Therefore, Admiral Owens calls for a transformation of the DoD.

Two shortcomings exist in Admiral Owens' argument. First, Admiral Owens maintains the assumption that technology and weapon systems can replace manpower. On the contrary, sustained or a possibly increased manpower will be necessary to maintain the information technology infrastructure and do the dirty work to clean up what the precision weapons missed. Second, he urges the DoD to cut back its reliance on defense contractors and form open relationships with "high-tech" companies. Moreover, the high-tech companies would build a satellite surveillance network to help the military meet the future threats. Unfortunately, it is hard to overlook that this argument might owe something to his position in a satellite corporation.

The book's stated aim is clear and seemingly non-controversial. Despite this, *Lifting the Fog of War* equates to views contrary to the establishment. However, in perspective, the 4th ID's recent digitized rotation at the NTC might have validated many of Admiral Owens' arguments for advanced technologies. Despite any criticism, this book is far-sighted and belongs on the bookshelf of "out-of-the-box" thinkers.

JOHN P.J. DE ROSA
1LT, Armor
1-185th Armor
Apple Valley, Calif.

America and Guerrilla Warfare by Anthony James Joes, University Press of Kentucky, Lexington, Ky., 2000, 418 pages, \$30.00 (cloth).

The arrival of this book comes at a propitious time, as we review our military strategies and needs for the 21st century. The possibility of American involvement in future guerrilla conflicts seems high, as long as we remain committed to the idea of peacekeeping, and Anthony James Joes has reached a surprising conclusion: Americans have generally enjoyed great success in this form of mission.

I say surprising because, for many American officers, steeped in the history of the Vietnam War, guerrilla warfare is anathema and to be avoided if possible. However, Joes, professor of international politics and director of the international relations program at St. Joseph's University, has examined nine guerrilla conflicts in which Americans played a leading and largely successful role, stretching from the American Revolution to the Soviet-Afghan war of the 1980s. His comparative analysis of American actions in these guerrilla wars picks out common threads and reaches this conclusion.

Joes' study examines the origins of each of these guerrilla conflicts, why Americans be-

came involved, and how they participated. While he expresses concern about being too quick to derive "lessons" from this study of history, Joes nonetheless finds that Americans have been generally successful in both the conduct of guerrilla war (given examples during the American Revolution and the American Civil War) and the combating of guerrilla movements (citing the examples of the Philippines, Nicaragua, Greece, El Salvador, and Afghanistan). In fact, he concludes that in the majority of these latter cases, American interests were successfully served without the direct involvement of American forces. Joes argues that the great exception was in Vietnam where U.S. interests were finally defeated, although not by the guerrilla war, but by American abandonment of its South Vietnamese ally, which in turn allowed the success of a massive North Vietnamese Army invasion.

Beyond the standard conclusion about carefully choosing to combat guerrilla movements only when that is in the national interest and can be defended to American public opinion, Joes argues that real victory in guerrilla war requires not just a military victory, but "an enduring peace." Joes' prescription for achieving this kind of peace is to limit bloodshed, to offer a peaceful alternative to the insurgency, and above all, by displaying rectitude in carrying out the counter-guerrilla campaign. To the extent that American counter-guerrilla warfare has been successful, as illustrated by these historical examples, Joes argues that it was because American policy generally followed such a course.

Joes' argument may stir up controversy and debate, but his ideas are thought-provoking. Well researched and well written, *America and Guerrilla Warfare* provides new insights into guerrilla conflict and how it should be fought, by reminding us of our own past success in this form of warfare. Professional officers and military historians alike will find this an engaging book, well worth their time.

STEVEN C. GRAVLIN
LTC, Armor (Ret.)

Devil Dogs – Fighting Marines of World War I by George B. Clark, Presidio Press, Inc., Novato, Calif., 1999 (2nd Edition printed in 2000), 463 pages, \$24.95.

The contributions of the United States Marines in the First World War have never been, to my knowledge, fully addressed by any author. Aside from some short works or reviews on the actions of the Corps in the Great War, perhaps most specifically at the battles of Belleau Wood and Chateau Thierry, a full-scale, in-depth study has never been attempted or accomplished.

Mr. Clark attempts to fill this void with *Devil Dogs*. His efforts to produce a complete study of the Marine brigades in France have filled a long overdue gap in Marine history. The author has published previously on Ma-

rine Corps history and is a former Marine himself, who quite evidently takes great pride in his association with the Corps. On an interesting note, Clark also owns and operates a bookstore specializing in military history.

The book does an excellent job in covering the history of the Corps, taking the reader from recruitment and training to deployment, conflict, the occupation of Germany and then demobilization. Clark ably shows how the Marines, although resented by General Pershing and the Army, which did not want a "second ground force," succeeded in making major contributions to the efforts of the American Expeditionary Forces. Most of the book is devoted to Belleau Wood, but Clark also provides excellent reviews and analyses of Verdun, Soissons, the Marbache Sector, the Meuse River Campaign, and Blanc Mont.

Unfortunately, Clark comes across sometimes as a bit wordy and he has a tendency to overwhelm the reader with details. At times I felt I was reviewing an AAR rather than a historical treatise. However, Clark eventually catches his stride with his story, using a very conversational style that is both unusual and refreshing. He is very open and candid in his assessments of leadership and ability. Of particular note is his extensive research utilizing every resource conceivable and available, especially diaries and personal accounts, to produce his book. He makes excellent use of maps, charts and graphics, as well as a good photographic section.

I found *Devil Dogs* to be a fascinating book and well worth the time to struggle through the occasional slow spots. For those interested in the First World War or the role of the Marines in that conflict, I'd not hesitate to recommend reading this work.

STEVE PATARCITY
Staff Training Officer
99th Regional Support Command

DIEN BIEN PHU: The Epic Battle America Forgot by Howard R. Simpson, Brassey's Inc., Washington D.C., 1996, paperback, \$17.95 online.

Howard Simpson, in an authentic voice gained through experience at Dien Bien Phu as a U.S. Information Agency correspondent, writes this volume on the French defeat by the Viet Minh at Dien Bien Phu. While possessing a genuine flair for involving the reader in the action, the author is also to be commended for his meticulous research, including thorough interviews with surviving participants in the battle.

This book describes the events from the time when the first French forces were securing the isolated valley to the bitter defeat brought on by so many mistakes and failures of judgment. As the situation grows more desperate, and as it becomes clear that all will inevitably be lost, the reader's irritation mounts into a maddening frustration with the French leadership and their failure to either

adequately support or extricate the defenders from a clearly untenable situation. It is a testament to the skill of the author that his work can produce such strong feelings so many years after the event.

Most importantly, this text offers more than a tale of imperial collapse. It is a well-written treatise that portrays in stark detail the many strategic and tactical failures at Dien Bien Phu. Most regrettably, less than a decade after a cease-fire was finally signed in Geneva, U.S. and allied forces were fighting, dying, and relearning the awful lessons of the French experience in Indochina. Simpson offers a brilliant and tragic story that serves as both a lively introduction to the serious student of this battle and a gripping narrative of a lonely garrison under siege. A must-read for any serious student of low-intensity conflict.

SGT MICHAEL A. ROSS, USMCR
World Basic Information Library
Foreign Military Studies Office
Ft. Leavenworth, Kan.

Tides of War, A Novel of Alcibiades and the Peloponnesian War by Steven Pressfield, New York, Doubleday, 2000, 429 pages, \$24.95 (hardcover).

Most of us might have only heard of Alcibiades from a line in the movie, "Patton." George C. Scott, speaking of Sicily, said that old Alcibiades knew Syracuse was the key to the island, and old Alcibiades always went for the jugular. Alcibiades was much more than that, as Steven Pressfield relates.

This is a work of historical fiction, but a book of power, leadership, and brave men. Pressfield drew from Thucydides' *History of the Peloponnesian War* for the setting of this story. This war between a land power, Sparta, and a sea power, Athens, provides the backdrop for a well-written novel of intrigue, a primer on leadership, and a thought-provoking look at a democracy waging war, a war that Athenian democracy lost.

Told as a story related from a grandfather to grandson, the story recounts the adventures of the man who killed Alcibiades. This is a powerful story as the assassin Polemides recounts the tale of the rise, fall, rise, and death of Alcibiades. Pressfield skillfully weaves all the characters of ancient Greece into the story, Socrates, Lysander, and Pericles. The war is fought on land in Greece and Sicily, on sea across the Mediterranean, and in the councils of both Sparta and Athens.

The story paints vivid word pictures of the infantryman's war on land, and the marine's war at sea. It is brutish and described as such. But Pressfield also tells a tale of a real leader of men.

Alcibiades is asked, "How does one lead free men?" He responds, "By being better than they, by being better and thus commanding their emulation. A commander's role is to model *arete*, excellence, before his

men. They will be compelled by their own nature to emulate it." Pressfield shows a commander who leads by example throughout his book. There are lessons of tactics, operational art, and even strategy in this book — all told through the eyes of the man who killed Alcibiades.

If you look for parallels between ancient days and today, you will find them. There are discussions of democracy and its need to tear down its leaders when they do not produce victory, or are too good, thus prompting the search for flaws. There are discussions of the role of the military and the use of force by a democracy.

The highest praise I reserve for a book is that it made me think, as well as educating and entertaining me. Take time after duty hours, find your favorite chair at home, and read of leaders and intrigue in ancient Greece. This is a timeless story of soldiers, honor, and duty.

COL KEVIN C.M. BENSON
U.S. Army War College Fellow
MIT Security Studies Program
Cambridge, Mass.

Jeff Davis's Own: Cavalry, Comanches, and the Battle for the Texas Frontier by James R. Arnold, John Wiley & Sons, New York, 2000, 377 pages, \$30.00.

When Texas joined the Union in 1845, the United States gained a new state more than six times the size of Ohio and larger than France. Protecting the population of this vast new acquisition was added to the tasks of the already overstretched U.S. Army. As Secretary of War, Jefferson Davis wrote in 1853, the duty of repressing the hostilities among the Indian tribes and protecting frontier settlements from Indian depredations was the most difficult task the Army faced, and nowhere was it more difficult than in Texas.

At the time, there were only three mounted regiments in the Army: the 1st and 2nd Dragoons and the Regiment of Mounted Riflemen. In 1855, Congress finally authorized the creation of two additional mounted regiments, the 1st Cavalry Regiment and the 2nd Cavalry Regiment. Although both regiments were organized at about the same time, the 1st at Ft. Leavenworth and the 2nd at Jefferson Barracks, Secretary Davis paid particular attention to the staffing and equipping of the 2nd. With its hand-picked personnel, its thoroughbred horses, and the best of everything available, it soon became known as "Jeff Davis's Own" or "Jeff Davis's Pet." In *Jeff Davis's Own*, author Arnold recounts the story of the regiment from its formation to its evacuation from Texas at the start of the Civil War, as well as the regiment's first fighting in the war.

Cavalry was considered to be a new branch, probably Davis's handiwork to allow him to disregard branch seniority in selecting officers for the new regiments. Thus, he was

able to pick officers and appoint them to the senior levels of the regiment without regard to their current ranks. Appointed as colonel and regimental commander was Major Albert Sydney Johnston, once called by Zachary Taylor as "the best soldier he ever commanded," but also a close personal friend of Davis. As lieutenant colonel and second in command, Davis chose an engineer, West Point superintendent Robert E. Lee. The roster of officers included individuals who would gain senior rank and fame in the Civil War years: Majors William J. Hardee and George H. Thomas, Captains Earl Van Dorn and Edmund Kirby Smith, and Lieutenants John B. Hood and Fitzhugh Lee. Twenty of the 34 officers of the regiment were West Point graduates.

The regiment left Jefferson Barracks in October 1855 and arrived in Texas in December to begin its arduous frontier service. Until the Civil War, the principal enemy would be the Comanches. Told by the Mexicans that the whites could not be trusted, and already experienced in seeing white encroachment on their land, the Comanches violently resisted the pressure to move farther and farther west. They were superb riders and highly skilled with bow and arrow and lance. Raiding was a way of life with them and they ranged from Indian Territory (now Oklahoma) to Mexico, seizing horses and killing the unwary.

Never before had the Americans faced a foe such as this. A Comanche had no permanent abode and moved his family and belongings in minutes. Widely dispersed warrior bands could harry a long stretch of frontier and escape with impunity. The 2nd Cavalry soon found that most patrols that set out to pursue a hostile band found themselves outdistanced and on another fruitless mission. Yet occasionally, perseverance paid off, and the Indians could be brought to bay. The author describes in detail each of the regiment's major successes, as well as recounting the drudgery of uneventful routine patrols.

A great value of this book is the insight the author brings to describing the Texas environment: the relationship between civilians, the Army and the Texas Rangers, and the transition of the Indians as they were gradually worn down by the relentless pressure of the encroaching civilization. This book is much more than just the story of the 2nd Cavalry. It presents the reader with a knowledgeable analysis of the total Texas frontier and its inhabitants.

When Texas seceded and the Army's commanding general in the area gave up the Army's assets, the regiment was in a difficult position. That the regiment was withdrawn successfully was due in no small part to the skills of Lieutenant Colonel Lee. The regiment was soon in Virginia. It was redesignated the 5th Cavalry when all the mounted regiments were designated cavalry and all were numbered according to their dates of establishment. The regimental narrative closes with a recounting of service in the Penin-

sula Campaign. An appendix reminds the reader that the regiment has continued to serve, in the Pacific in World War II, in Korea, and in Vietnam. The appendix also includes a summary of the later careers of many of the officers who served in Texas.

This book is well-written and, more importantly, covers a period of frontier service that has not received the coverage it should have. Anyone interested in cavalry service in the West will find this book of great interest. In addition, 5th Cavalrymen of today will learn much of their regiment's early days.

PHILIP L. BOLTÉ
BG, USA, Ret.
West Union, S.C.

Day of Deceit: The Truth About FDR and Pearl Harbor by Robert B. Stinnett, Simon & Schuster, New York, 2000, 260 pages, with 126 pages of detailed notes and a 12-page index, \$16.00.

This is a stunning, sobering, compelling, and disturbing book. When many are still arguing about our questionable entry into the Vietnam debacle, it comes somewhat as a shock to learn that one of our country's greatest presidents, Franklin Roosevelt, deliberately maneuvered the United States into World War II.

Not without reason. Germany had overrun The Netherlands, Belgium, Denmark, Norway, France, and North Africa. Italy had allied itself, however uneasily, with Germany, and the German-Italian Axis had signed a mutual assistance pact with Japan. Japan, in turn, was expanding rapidly into China. Russia, having taken over much of Poland as well as Latvia, Estonia, and Lithuania, was cautiously exploring Romania and Bulgaria while keeping up a pretense of friendship with Germany. By mid-1940, Hitler had decided to invade England. Roosevelt faced a terrible dilemma.

He was convinced that, should England fall, the future of the United States would be gravely endangered. Yet there were strong isolationist feelings in America where 88 percent of the population felt we should not become embroiled in a European war. Roosevelt was desperate to find ways to help England, but had campaigned on the promise that, "Your boys are not going to be sent into any foreign wars." Even so, he had observed to his staff that "if somebody attacks us, then it isn't a foreign war, is it?"

Enter a young Navy officer, LCDR Arthur McCollum from the Office of Naval Intelligence. In October 1940, he wrote a memo that would have a crucial impact. He proposed eight actions that would incite the Japanese to attack both the United States forces in Hawaii and the British and Dutch bases in the Pacific. Every one of these actions was implemented, some within days. Action D was to send a division of heavy cruisers to the Orient. Roosevelt personally directed this provocative action, saying "I just want them to keep popping up here and

there and keep the Japs guessing. I don't mind losing one or two cruisers, but do not take a chance on losing five or six." Admiral Richardson, CINC U.S. Fleet, objected to placing his ships in harm's way to provoke a Japanese attack. So he was relieved!

This book tells in overwhelming detail the various steps taken deliberately by the President and his closest advisors to agitate the Japanese while simultaneously limiting information provided to the Army and Navy commanders in Hawaii on the Japanese reactions. The detail is staggering, the disclosures disturbing. There seems to be no question that the President knew the attack was coming; only the exact timing and size of the attacking forces were unknown!

How has this information just now surfaced? Stinnett used the Freedom of Information Act to force the disclosure of much of it, an Act that was not available in previous attempts to investigate the Pearl Harbor disaster. (The author even dedicated the book to Congressman John Moss who wrote that Act.) Stinnett does not attempt to justify the morality of Roosevelt's decision and notes that this book "does not diminish Franklin Delano Roosevelt's magnificent contributions to the American people. His legacy should not be tarnished by the truth." Who he really blames are the security types who have under various guises kept this information from the public for over 50 years, far beyond any wartime — or peacetime — security needs.

To someone like this reviewer, who still remembers that tragic Sunday and who believed for years that our intelligence was simply faulty, this book comes as a bitter revelation of political exigency. To younger readers who are still arguing over the Vietnam affair or our entry into a hundred other political turmoils, this should be a real eye-opener. You want to believe we're always the guys in white hats? Go back and read Clausewitz and Machiavelli!

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Battle Stations: Decisive Weapons of the Second World War by Taylor Downing and Andrew Johnston, Pen and Sword Books Limited, Leo Cooper, 2000, 239 pages, \$29.95.

Battle Stations: Decisive Weapons of the Second World War is an entertaining survey of four decisive weapons: the Spitfire, the C-47 transport plane, the Sherman tank, and the DUKW amphibious truck. It is a companion to the History Channel's "Battle Stations" documentary series (available on VHS at HistoryChannel.com, \$59.95). I received my book the week the series aired and was able to compare the two.

I found book and series informative, interesting, and well organized. However the book and the documentary each provided details not found in the other. The book adequately stands apart from the documentary, a test

for any companion book. It provides backgrounds of each system, reasons they were designed, how they were designed, fateful decisions regarding their manufacture and employment, and the subsequent results. I found the authors' choice of "decisive" weapons curious, but they adequately plead their case.

The book appears historically accurate. Disappointingly, the authors excluded endnotes and bibliography. They included a useful index divided by system. Arranged throughout are informative sidebar insets relevant to the background of the subject. *Battle Stations* is written from a British point of view. It is just objective enough to glean a fair, relevant critique of history's mistakes and triumphs if taken with a pinch of salt.

The book contains 203 black and white photos arrayed to support the text. Twenty-four color photos extracted from action sequences shot for the television series are included in the back. The sequences involved re-enactors in appropriate uniforms employing equipment wonderfully preserved by dedicated collectors.

Armored warriors may find interest in the Sherman tank chapter. It illustrates the British and American militaries' willful negligence of crew safety in favor of mass production. Strategic planners relied on sheer numbers to defeat the German Army on the grand scale, overlooking the impact on allied crews at the tank-versus-tank level. This bears close scrutiny given the current drive to lighten the Armored Force.

I recommend the book and the videos to those in the acquisition field. Both offer a substantial independent or seminar study on the acquisition of modern military equipment. *Battle Stations* is not a vital addition to everyone's professional library. However, it provides interesting insights into the development and employment of military technology. Some lessons are worth review given today's Transitional Army.

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Combat Operations: Stemming the Tide, May 1965-October 1966 by Dr. John M. Carland, Center of Military History (<http://www.army.mil/cmh-pg/>), Washington, D.C., 2000, 410 pages; \$43.00 (cloth), \$36.00 (paper).

This book is the eighth in a series published by the Center of Military History on the topic of U.S. Army participation in the Vietnam War. In order for this volume to be viewed as a successful addition to the historiography already in existence, Dr. Carland faced three tasks: first, he had to set the overall historical setting without appearing to pass judgment; second, he had to tell the story of the development of U.S. combat operations in this theater to an audience which is, in many cases, intimately familiar with the actions

themselves; and lastly, he had to accomplish his first two tasks in a manner that created in his readers a desire for future volumes in the series. I am pleased to report that Dr. Carland's work succeeds in all three areas.

With regard to the first challenge, this book begins with a review of the geopolitical situation that ultimately resulted in the escalation of U.S. involvement. The first two chapters serve as a platform for describing the historical setting against which subsequent combat operations are set. The discussion of the political environment is quite satisfactory without overwhelming the reader with either superfluous details or biased opinion. The story of the deployment of the first two U.S. brigades (the 173rd Airborne Brigade, followed by the 2nd Brigade of the 1st Infantry Division) transitions smoothly to a brief description of the deployments of the 1st Cavalry Division and the remainder of the 1st Infantry Division. The reader needs this background in order to fully appreciate some of the challenges faced by these "early-entry" forces. With the historic setting complete, the author embarks on what is, in my opinion, the greatest of his challenges: the discussion of the early combat operations from May 1965 to October 1966.

It must be difficult for an historian to describe actions that occurred in the not too distant past to an audience that in many cases actually participated in the events under review. The temptation to embellish the events to somehow lend credibility must be strong, but in my opinion Dr. Carland resisted that temptation and presents the reader with a balanced and historically accurate account of these early combat operations. The reader will find sections that flow smoothly one into another, all the while keeping in touch with the overall theme of the work itself. Readers familiar with more detailed singular accounts of specific actions (the story of LZ X-Ray, for example) will find the author's treatment of certain combat actions more than adequate without attempting to replace those works which serve as authoritative references. For those readers who are not yet familiar with the specifics of some of the early Vietnam War combat actions, this work will serve as an excellent introduction. The storytelling is all the richer for the inclusion of numerous photos and illustrations.

Dr. Carland succeeds with regard to the third task because this volume is well-written, extremely well-documented (the footnotes and bibliography alone make this work a worthwhile addition to any military historian's collection), and told without a hint of bias. The work will appeal to both amateur as well as professional military historians; the former because of the manner in which the story of combat operations is told, and the latter because of the detailed research conducted by the author. I recommend this book as a "must-have" addition to your library of works on the Vietnam War.

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Stealth Recon Vehicle With “Melted Look” Is Introduced at Mideast Arms Show

A firm in Belarus, one of the republics of the former Soviet Union, has introduced a new, 27-ton tracked reconnaissance vehicle designed with stealth characteristics. The Stalker 2T was introduced at the Abu Dhabi arms show earlier this year, drawing attention because of its unusual appearance.

Although manufactured from welded armor steel, the turret of the Stalker has rounded edges and a dull surface coating said to help defeat radar and infrared detection. At either side of the turret are retractable missile launchers for antitank and anti-aircraft defense, employing the SA-18 or SA-16 SAMs and the AT-6 “Spiral” AT missile, which can employ either HEAT or thermobaric warheads (see article on thermobaric weapons elsewhere in this issue). The main armament is a stabilized 30mm cannon, teamed with a 7.62mm coaxial machine gun and 30mm automatic grenade launcher.

The fire control system includes day/night thermal imaging and a laser rangefinder. An NBC defensive system protects the crew of three and laser detectors automatically trigger smoke-screen protection. A diesel engine and hydro-mechanical transmission propel the vehicle and a hydro-pneumatic suspension system allows the driver to adjust the ground clearance from six inches to about 24 inches.



The 2T Stalker, from Belarus, weighs in at 27 tons.

The vehicle commander and gunner are situated in the turret, each with day/night sights on the turret roof.

Those attending the IDEX 2001 show in Abu Dhabi were impressed with the vehicle’s appearance, its cross-country capabilities, and its 100km/hr top speed. It was also shown at a time when there is little new in the armored vehicle market.

The chassis is apparently derived from the 2S6 Tunguska gun-missile anti-aircraft system, which is also manufactured by the Belarus-Minotor Service Unitary Enterprise. The firm said that the Belarus Army is acquiring the first 30 production vehicles.



Below, the turret detail shows the pair of missile launchers in the raised position. One launcher is for anti-aircraft missiles, the other for antitank missiles, both Russian weapons.

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