ARMOR

Armor in Low-intensity Conflicts *See Page 6*

January-February 2002

Saddle Up... Tonight We Ride

"*The test of a good religion is whether you can joke about it.*" — G.K. Chesterton

Chesterton supplies an excellent touchstone, a telling one. An institution, organization, or person that cannot tolerate humor, or lacks a sense of humor, is often revealed as insecure or unsure. For the most part, reader comments on Rex Awesome's "just plain stupid things" in the last issue were favorable. Many readers identified with one or two items from Rex's list and a couple suggested additional items. But a select few took umbrage; one stated that a professional journal is no place for humor. I disagree. There is a place for humor in a professional journal, and when you look further into the pages of this issue you'll find we are blessed with some great examples via "Murphy's Laws of Armor" and the accompanying cartoons by SFC Mark Baker.

As my ride nears completion, with both the Army and the magazine, it's appropriate to share some thoughts on the future of this 114-year-old journal and the balance that must be maintained to ensure its survival. Three forces battle for *ARMOR's* soul: the editorial staff, senior leadership, and readers and contributors. For the magazine to succeed and accomplish its mission, "Providing the Chief of Armor with a forum to communicate with the mounted force and provide that force with a professional journal to discuss all manner of issues concerning mounted war fighting," a delicate balance must be achieved and maintained between these three interest groups. Each group of these stockholders endeavors to pull the journal in their direction. As long as the groups exert roughly the same amount of force in opposing directions, the ship sails smoothly; however, if one force pulls too hard or ceases to pull, the ship's course is altered, perhaps fatally. Thus one should discover material in every issue that represents or challenges each group's agenda or viewpoint. Input to the journal via letters, articles, and reviews should represent opposing viewpoints and originate from a variety of sources.

"*The word, even the most contradictory word, preserves contact — it is silence which isolates.*" — Thomas Mann. Some question the need for a professional dialogue or debate; why foster or facilitate divergent views, they ask? *ARMOR's raison d´être* is clearly stated: "...not to reinforce official positions, or to act as a command information conduit, but to surface controversy and debate among professionals in the force." Debate and discussion are hallmarks of the mounted force's evolution. Failure to engage in a professional discussion impacts the branch's ability to evolve and could result in a stagnant force relegated to the sidelines. Ours is a history of evolution and change, change that reflects the ever-changing nature of warfare and technology. True, this debate and transformation has often been painful, producing rancor, but certainly the end result warrants the pain and effort expended.

No leader relishes having his agenda criticized, especially in an institution like the Army, and certainly, some of the criticism will be off the mark. But if the leader is thin-skinned and prone to squelch discussion, he loses the value of those points that *are* valid. Discussion dries up; stagnation sets in, and in the minds of the led, the most important deadline becomes the leader's ETS. We have been fortunate, most of the time, in having a free hand to publish controversial points of view. In the rare case, or cases, when a viewpoint has been muzzled or suppressed, both readers and leaders have suffered. In one case a few years ago, a particularly visible controversy about an *ARMOR* article blew up into a censorship flap. In the year that followed, *ARMOR* submissions dropped from 150 articles a year to about 100, and one can infer that the submissions we got that year were probably not the most opinionated or controversial. We all took casualties in that fight.

So let's keep our minds open and relish the opportunity the Army journals offer. You owe us, as professionals, the value of your opinions. We owe you a hearing.

— D2

ARMOR

The Professional Development Bulletin of the Armor Branch PB 17-02-1

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ARTICLE SUBMISSIONS: To improve speed and accuracy in editing, manuscripts should be originals or clear copies, either typed or printed out double-spaced, with a 3½-inch disk in Microsoft Word, WordPerfect, WordStar, Rich Text Format, or ASCII (please indicate wordprocessing format on disk or cover letter). Tape captions to any illustrations or photos submitted. Additionally, we accept articles as e-mail or attachments at:

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When sending articles via email, please include a complete mailing address and daytime phone number.

SUBMISSION POLICY NOTE: Due to the limited space per issue, we will not print articles that have been submitted to, and accepted for publication by, other Army journals. Please submit your article to only one Army journal at a time.

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UNIT DISTRIBUTION: To report unit free distribution delivery problems or changes of unit address, phone DSN 464-2249; commercial: (502) 624-2249. Requests to be added to the free distribution list should be in the form of a letter or email to the Editor-in-Chief.

EDITORIAL MAILING ADDRESS: *ARMOR,* ATTN: ATZK-ARM, Bldg 1109A Sixth Avenue, Room 371, Fort Knox, KY 40121-5210.

ARMOR MAGAZINE ONLINE: Visit the *ARMOR* magazine website at *www.knox.army.mil/armormag.*

ARMOR HOTLINE — DSN 464-TANK: The Armor Hotline is a 24-hour service to provide assistance with questions concerning doctrine, training, organizations, and equipment of the Armor Force.

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LETTERS

Real Readiness Depends On Stabilizing Soldiers in Units

Dear Sir:

I found CPT Henderson's article about training focus to be insightful and practical (Nov-Dec '01). The need to focus training on a limited number of tasks, to use battle drills and, in general, to keep things simple in this high-OPTEMPO world are all right on target. I would suggest, however, that until the Army fixes the personnel turbulence problem in our tactical units, efforts such as those advocated by CPT Henderson will have only limited utility.

As a tanker who has led armor units from platoon to battalion and served as an observer-controller at the CMTC, I have seen at close hand the terrible effect of personnel turnover on unit readiness. Here is just one example: All tankers know well the hoops we go through to stabilize tank crews for a gunnery density only to see PLDC, BNCOC, ANCOC, and/or the must-fill-it-now general's aide job screw it up. Then immediately upon return from gunnery, what happens to the unit? Roger — we emasculate it with the summer PCS cycle, other reassignments, and changes of command just so we can start over for the next training event.

History teaches us, and we know what works — individuals training together over a long period of time develop not just their individual task proficiency but also their expertise as a smoothly functioning team. All of us have at one time or another served in a unit that has deployed for a peacekeeping mission, performed an Intrinsic Action rotation or conducted a CTC rotation. We know the benefits of training a stable team for 3 to 6 months and then "fighting" with that team. Anyone who has been lucky enough to be in a unit where large numbers of unit leaders have been together through more than one of these kinds of missions has experienced those magical qualities we call cohesion and teamwork. The tremendous increase in battlefield prowess that is possible under these conditions is significant and obvious. We know what right looks like; we just can't get there from here.

Until the Army can find a way to stabilize soldiers in tactical units in a way that takes into account their training and deployment schedules, armor leaders will struggle merely to maintain a minimal level of readiness. In effect, the Army currently trains individuals who happen to be assigned to particular units. The good of the soldiers [i.e., his career] is more important than the unit's readiness to fight. Until we reverse this logic by training units, not just individuals, we will never be ready to fight and win on short notice.

LTC TIMOTHY R. REESE
U.S. Army War College

An Author Responds Regarding Kubinka Museum Article

Dear Sir:

I'd like to thank Steve Zaloga for his comments about my article, "The Secret Museum at Kubinka" (*ARMOR*, September-October 2001). Since he has visited the museum and written about the vehicles in the collection, his viewpoint is a valuable one. I do, however disagree with his comments concerning a "lack of interest" in the post-war U.S. vehicles in the collection. On the contrary, descriptions and photo confirmation of U.S. vehicles in former Soviet hands are not only very rare, but are very interesting to those unable to visit collections like the one at Kubinka.

While the U.S. vehicles themselves are obviously well known, the interest lies in which vehicles are included and how they got to Kubinka. In fact, the small number of books that have been published dealing with the vehicles at Kubinka normally include very limited information about the U.S. vehicles, or they avoid the subject entirely. While the former Soviet vehicles at Kubinka provide important information about the hardware of our former enemy, the non-Soviet/Russian vehicles in the collection provide valuable insights into what that same former enemy considered to be important.

JIM WARFORD

Along with the Digital Gee-Whiz, Let's Keep Our Paper Manuals

Dear Sir:

I recently completed your November-December magazine and was encouraged by CSM Christian's article on the incorporation of electronic manuals in the 19-series Advanced Noncommissioned Officer Courses. It appears that we are taking positive steps to keep up with trends in civilian education. However, as a line unit user of many of the same publications, I am appalled at the consequences of the Army's "less-paper" policies. To completely replace mass publication of hard copies, particularly of field manuals and technical manuals, is simply wrongheaded. In recent months, it has become impossible to procure previously common manuals such as 19-series STPs; *FM 17-95, Cavalry Operations*; *FM 22-5, Drill and Ceremonies*; or even TMs for our M40/M42 protective masks. Although some publications are out of circulation for regular revision, frequently the new versions are released only in electronic format or "on-line." I was astonished to learn that the new *FM 17-12, Tank Gunnery* will be available almost exclusively over the internet.

It's a nice idea, and I am sure it saves many training dollars. Still, there is no laptop computer on a tank or scout platoon's list of basic issue items. As yet, no TACLAN (Tactical Local Area Network) has materialized on the screen line. Our often-abused mechanics must now master the task of keeping the FRH (Flame Resistant Hydraulic fluid) off one last finger to save the computer mouse pad. Sure, we could print out the needed pages on the unit's single stuttering ink jet, but we'll have to predict the needed pages in advance. Probably more than 300 pages will require another $30 ink cartridge and more than 5,000 pages a new printer. Shifting the cost to the unit budget is neither fair nor efficient in terms of printing costs. Let's not even explore the rumor that the Army wishes to dispose of paper maps. I can see it now, the entire troop leadership gathered in the commander's turret for the operations order...

I am not a Luddite. There is merit in the plan to convert many manuals to electronic format, and I find that I prefer ETMs (Electronic Technical Manuals) *for certain purposes.* Nevertheless, hard copies (to include maps!) furnished by a centralized publications system remain a vital need at the pointy end. As my gunner put it: "Sir, I've never dragged a monitor into the can with me. People might wonder."

1LT JOSEPH BERG
A/1-7 Cav

TOW-HMMWV's Thermal Sight Works Fine for Light Cavalry

Dear Sir:

Just finished reading the November-December issue, and I felt compelled to write in response to the article, "Breaking the Reconnaissance Code," by CPT Eric Shaw. Overall, CPT Shaw's article was very informative, particularly his scout training plan. However, CPT Shaw makes some assertions in his article that need closer scrutiny. He writes about how the CFV has a distinct advantage over the HMMWV because of its thermal capabilities. This comment is true only if the HMMWV isn't equipped with a TOW, a weapon system common to all scout platoons in a light cavalry troop. Having been in two light cavalry troops, the TOW was a tool utilized numerous times to gather information on mounted and dismounted enemy assets at the Joint Readiness Training Center and other training areas.

The other point I'd like to discuss is CPT Shaw's point that OPFOR scouts are more effective than their BLUFOR counterparts because, "...they are afraid to die." He then writes that BLUFOR scouts, "...lack...the will to wage war and do their job the proper way." I couldn't disagree more. Having seen the OPFOR scouts from both a BLUFOR and OC perspective, they are successful because they know how to "play the game."

From covering their MILES head halos with the front flap of the boonie caps to using rifle sights to using Vaseline on their torso sensors, the OPFOR are good because they train on the same ground month after month and year after year. They have the opportunity to create and hone field SOPs because they spend two weeks out of every month implementing them. They face the same scenarios month after month. Most BLUFOR units don't have the ability to spend that much time in the field. While this might sound like whining to some, my only point is that the OPFOR have several advantages to begin with and that is the main reason they have success.

A true test of a unit's proficiency would be to take them and a unit from a CTC and have them fight on a neutral piece of ground. While this isn't very realistic, we as leaders must be careful not to fall prey to the idea that training center units are that much better tactically than their counterparts.

T.J. JOHNSON
CPT, Armor
Fort Knox, Ky.

**Tankers Lose MOS Skills
When Deployed in IBCT Units**

Dear Sir:

The article "Medium Gun System Platoons" by 2LT Brian P. Hurley (*ARMOR,* Sep-Oct '01, page 7) is fascinating in what it reveals about the organization. Let me begin by commending the author for a clear and concise report. He is obviously proud of his unit and its performance, and rightfully so. The MGS platoons are evidently performing well and satisfying their infantry leaders. And that's exactly the problem.

A soldier spends most of his career training for the short, brief experience spent in battle.

Correction

On page 10 of the November-December 2001 issue, we incorrectly identified the officer at the far right of the photo as MAJ Robert Grow. The officer at the far right facing the camera is the future MG E. N. Harmon.

Success in combined arms operation presupposes skillful proficiency among the various participants. It's wonderful when resources permit realistic combined arms training, but this is obviously not the case at Fort Lewis as tankers lose their MOS skills while being retrained as dismounted infantry.

I do not wish to dwell on tactics, but some of the items mentioned in the article are plainly wrong. Using the sole MGS to breach barbed wire with a grappling hook while the infantry platoon's squad IAVs are standing by makes no sense. Neither does dismounting the MGS NCOs to lead infantry squads.

In 1978-79, I was a tank platoon leader at Fort Lewis. My platoon habitually supported a mechanized infantry company. We were frequently misused, and over time performed similar ill-conceived tasks and reorganizations to those discussed in the article and encountered most of the very same problems. [One time, I was actually told to dismount my platoon and assault a MOUT facility on foot (20 men with .45 cal pistols and 10 M3 "grease guns" between us). It was supposed to be "good training," but I flatly refused and common sense prevailed.] At least we had a parent company and battalion commander to protect us and fall back on for training, maintenance, and support.

Another problem with a three-MGS platoon is rank structure. Assuming an autoloader in the MGS (meaning a three-man crew), we are creating 9-man platoons. This is ludicrous and won't last. We need to either make the platoons larger or we will eventually see them broken up into individual vehicles organic to the infantry IAV platoons.

We now see armor's role in the vaunted Interim Brigade Combat Team (IBCT), and it is a sorry sight. As the proponent for the MGS, Armor Branch has abrogated its responsibility to its tankers. It allowed stripping away battalion and company commanders

and dumped individual platoons to fend for themselves and be broken up even further by infantry company commanders who are focused on completely different training tasks.

Ideally, there should be an MGS battalion within the IBCT. Combined arms battalions, each with an MGS company, might work. Regardless, the MGS companies should be organized identically to tank companies. If armor will not or cannot provide the company commanders, then the MGS platoons should be handed over to Infantry branch, since that's who is in fact commanding and training them.

CHESTER A. KOJRO
LTC, AR, USAR (Ret.)

**Tank Guns on a Howitzer Chassis
Might Be Incompatible**

Dear Sir:

I heartily second Mr. Douglas' motion that the M113 should be the vehicle of choice for the IBCT (*Letters,* Sep-Oct '01). *ARMOR* reviewed *AIR-MECH-STRIKE: 3 Dimensional Phalanx for the 21st Century,* which is a work in progress on the subject, and gives a conceptual framework and rationale for an M113-based unit. A second edition is in review at present and should be published sometime in 2002.

His comments on using M109-series Self-Propelled Howitzers (SPHs) equipped with the M68 105mm tank cannon needs some background information. The field artillery had M108 105mm SPHs until the early 1970s. They were withdrawn from service and replaced by the 155mm, since the SPHs were designed to support heavy divisions. I imagine, though I'm not certain, that the M108 turrets were removed and M109 turrets were placed on the chassis, along with the necessary plumbing and other changes.

The dual-purpose use of an M68 cannon might be difficult, since tank rounds are fixed cartridges (large rifle rounds) and 105mm howitzer rounds are semi-fixed (a hand-fuzed projectile sits on a casing with individual powder increments inside, which are removed to change the range of the projectile). Tank guns change range by elevation; howitzers change range by elevation and the amount of powder behind the projectile, much like Navy main gun rounds. Tank rounds are fired electrically; howitzers by percussion caps, like black powder cap and ball weapons. There are, or used to be, HEAT rounds for the 105mm howitzer, but the problem is/was acquiring the target and getting the correct range to target for first-round hits. A laser rangefinder (LRF), a ballistic computer (BC), and an AT round (HEAT, HESH and/or APFSDS) would be a great addition to any SPH basic load.

COMMANDER'S HATCH

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

Written in Blood

The M1-series tank is designed to kill. It is an equal opportunity killer that doesn't distinguish between friend and foe or between training and combat. This tank can be your best friend if you take care of it and follow its rules. If you don't, it can be your worst enemy. Since 1990, we've had 14 non-combat fatalities and two permanent disabilities that are directly attributable to the tank. The majority of these accidents were caused by crewmen not paying attention to what they were doing, such as drivers being caught by the turret or by a failure to adhere to standards, such as not using the gun travel lock.

Every time we have a fatal or crippling accident, we re-evaluate the warnings, standards, procedures, and mechanical interlocks to see if changes could prevent a similar accident. The number of mechanical interlocks and safety features seem to increase daily. We've all seen the numerous safety warnings in the technical manuals. They are not put there to slow you down or make your work harder. Unfortunately, most of them have been put in place because someone was hurt or died; they're "Written in Blood."

This past September, we lost a tank commander in a breech accident. It appears that the accident was caused by the failure to engage any of the four existing mechanical interlocks, any single one of which, if engaged, would have prevented breech movement. The tank commander failed to follow normal safety procedures highlighted in the tank -10 manual and reinforced repeatedly in training. Bypassing safety interlocks or ignoring standards in a tank can mean death or serious injury.

The tank is not forgiving and it doesn't give you a second chance. Recently, a mechanic was permanently disabled in a breech accident because the standards and procedures were also ignored.

Webster's Dictionary defines an accident as "an unforeseen and unplanned event or circumstance" or as "an unfortunate event resulting especially from carelessness or ignorance." About 80 percent of Army accidents, both in peacetime and combat, involve human error. Often accidents cause more losses in soldiers and equipment than the enemy does. All accidents are preventable. We must focus on doing the job correctly, safely, and by the book. We must use safety devices and pay attention to warnings. We must provide leadership that focuses on proper safety control measures and train our subordinates to do the same.

Today's NCO is the front-line trainer and role model for our soldiers and the motivating force to eliminate accident losses. Each hour of each day, an NCO somewhere in the world enforces a standard, provides leadership, and instills the discipline that may prevent a future accident. If the NCO refuses to follow the standards or tells his crew, "Just do as I say, not as I do," he fails in his duty as a leader and more importantly, he fails his crewmembers. Doing something the right way has got to become second nature; that is why we must "train like we fight." We must train correctly and follow the safety procedures outlined in the -10 technical manuals. We must train safety procedures to become second nature and habitual, so whether in a high-stress situation or in the comfort of our own

motor pool, we will still operate safely. However, if we ignore the safety features and warnings when we train, we will continue to lose more soldiers to accidents.

Leaders must train and set examples for their soldiers and must always adhere to the standards. According to the U.S. Army Safety Center, there is a dangerous trend appearing. The most common violators that we see from accident investigations are sergeants, staff sergeants, and young officers. For example, in June 2000, during tank gunnery, a lieutenant allowed his driver to drive the tank in an unsafe manner, "power-sliding" around a concrete turn pad. The NCOIC of the range spoke with the lieutenant about the driver's recklessness and the fact that the lieutenant needed to keep himself at nametag defilade while acting as a tank commander.

The following day, the lieutenant failed to heed the warning of the NCOIC, and his driver once again attempted to power-slide around the turn pad. Unfortunately, the tank slid on some loose gravel, left the road, and rolled 360 degrees. The lieutenant was not at nametag defilade and the tank crushed him as it rolled. What could have prevented this accident? What would a good leader have done? What should the crew have done?

A common phrase that has stood for many years has been "soldiers will focus only on what the commander checks." Given this, commanders must demonstrate the knowledge for all safety requirements inherent to their

Employing Armor in Low-intensity Conflicts: Some Lessons for the U.S. Armor Force

by Second Lieutenant Noah Kanter

Much has been written about low-intensity conflict (LIC) — what it is and what it is not — but there is very little literature on how to fight one. This is probably because no nation has done so successfully, except possibly the British in Northern Ireland.[1] Many countries fighting a guerrilla war have tried to use the weapons and tactics they know best to defeat an inferior enemy, and when these nations had modern, mechanized armies, those weapons have included tanks and armored vehicles.

On the surface, tanks would seem to be a good choice to fight guerrillas. Tanks carry a lot firepower, are mobile, and are much better protected than infantry in the open. However, upon closer examination, tanks and other armored vehicles have not fared well against guerrillas, even lightly armed ones. One reason is that armor units have been unable to employ the decisive maneuver they enjoy in conventional war in the restricted terrain of low intensity fights. Moreover, they are vulnerable to well placed anti-tank rockets, anti-tank guided missiles (ATGMs), and mines, all of which are available to guerrilla forces. Finally, the high visibility of an armor operation, which includes the logistics sites, the road marches, and the combat operations themselves, make it hard to surprise guerrilla forces with armored units. Thus, armor struggles to gain the initiative in LIC.

A low-intensity conflict is not about quickly engaging the enemy's army, pinning him, and then using your reserve to flank him and decisively win. Rather, these conflicts tend to be long drawn-out affairs, where there are usually no front lines and nothing to decisively engage and flank. Moreover, the guerrilla enemy seeks to avoid being decisively engaged. Using terrain to mask his movements, the guerrilla will strike the stronger force before the stronger force can respond. In a LIC, the weaker force is not obligated to win; it must only keep from losing. The stronger force, on the other hand, will lose if it does not win. In that sense, the stronger force has a much tougher job than the weaker force. To right this balance, some armies have used mechanized forces to help them win.[2]
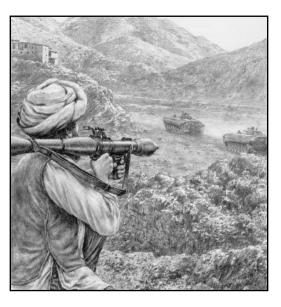
The Soviet invasion of Afghanistan and the Israeli invasion of Lebanon offer good examples of mechanized forces engaged against guerrillas. I have chosen these examples because both mechanized armies seemed militarily far superior to the guerrillas they engaged. In fact, they both were; however, both armies were ultimately forced to withdraw. Both armies made heavy use of tanks, armored personnel carriers (APCs), infantry fighting vehicles (IFVs), and mechanized infantry (infantry who ride to battle in APCs or IFVs).[3] Yet, both armies seemed at a loss to effectively employ these awesome weapon systems in LIC conflict.

Let's examine how each army employed its mechanized forces in LIC, and analyze the problems they encountered and their more successful techniques against guerrillas. Then we can compare the lessons they learned with the U.S. Army's preparations for fighting a low-intensity conflict with its armored forces, arguably the best in the world. This comparison will reveal that the lessons learned by the Russians and the Israelis in Afghanistan and Lebanon suggest weaknesses in the U.S. concept for using its armored forces in similar battles.

Afghanistan: 1979-1980

On December 24, 1979, the Soviet Union invaded Afghanistan to "stabilize" the country for pro-Moscow forces. Afghanistan is a land-locked country in central Asia, bordered by the former Soviet Union, Pakistan, Iran, and China. Most of the country is very mountainous, with the Hindu-Kush range covering about half the nation's territory. These mountains are steep, with peaks rising as high as 17,000 feet. In contrast, around Herat, in the western part of the country, the topography flattens out into a plain.

At the time of the Soviet invasion, Afghanistan had very few major roads, the few hardball roads having been built earlier with Soviet assistance. The climate is arid, with very hot summers and very cold winters. Most Afghanis were engaged in agriculture and illiteracy ran as high as 90 percent.[4]

The Soviets invaded Afghanistan in two phases. First, an airlift of paratroopers from the 105th Airborne Division assaulted the Kabul Airport with their BMDs; their mission was to seize control of the capital and start securing the countryside.

Meanwhile, a two-pronged thrust of armored and motorized troops, about three divisions, thrust overland from the Soviet Union. One group moved south from Termez down the Salang Highway, while the second group moved southwest from Kushka.[5] The

motorized force's mission was to take control of key cities and routes in order to secure supply lines. This invasion force eventually grew into the 40th Army Group, which included seven motorized rifle divisions, an airborne division, and five air assault brigades.[6]

Eventually, the Soviet Union had about 156,000 troops in Afghanistan.

Although the Soviets invaded with 1,200 tanks, and later peaked at 1,750 tanks, there were only about 320-460 tanks at the time of the Soviet withdrawal in 1989. The number of APCs and IFVs also rose and fell after a peak in about 1986.[7] Overall, the Soviets committed only about two percent of their forces to the fight in Afghanistan, compared to the commitment of 20 percent of U.S. strength in the Vietnam conflict.

Moscow did not configure its invasion forces for specialized guerrilla or mountain warfare. Instead, it sent units equipped and trained for combat against NATO forces in Eastern and Western Europe. These troops lacked specialized mountain training because it was assumed that combat would be accomplished by prepping the area with massive artillery barrages supporting the advancing dismounted infantry while tanks provided close-in support. Airmobile troops would seize the high ground when mechanized troops could not.[8] Rigidly adhering to the doctrine that had been tailored for a war with the West, the USSR deployed numerous support units with the invasion force simply because their parent units were deployed. These included chemical, air defense artillery, anti-tank, and surface-to-surface missile units. All of these units were recalled a short while later and replaced with more suitable units.

The quality and composition of Soviet units varied greatly. While the airborne unit was composed of Western Russians, the motorized invasion forces were composed mainly of Soviet Central-Asian reservists on 90-day call-up, troops of poor quality. Later, the Central-Asian troops were replaced by White Russians who were better trained and considered more politically reliable. Training remained an issue for the Soviet troops: until 1982, there was no specialized mountain training for conscripts prior to their arrival in Afghanistan. Also, at the start of the conflict, Soviet Army NCOs were not up to the challenge of small unit leadership. The conscript nature of the Soviet Army meant that NCOs had, at most, a year or so more experience than the men they were supposed to be leading. The centralized nature of Soviet doctrine, coupled with ineffective small unit leaders, were also major hindrances that impacted the Soviet ability to fight a guerrilla enemy. After 1987, this shortfall was reflected in Soviet military literature, which started calling for an improvement in the quality of the NCO corps.[9]

The Soviets faced an irregular guerrilla force know as the *Mujahideen.* The majority of Afghans opposed Soviet rule, with about 90,000 in guerrilla groups, but of these 90,000, only about 20,000 were actively involved in resistance at any one time, with few of these actually engaged in fighting.[10] Subdivided into opposing factions, the Mujahideen never fought effectively as a single unit; in fact, some of the Mujahideen factions were just as opposed to each other as to the Soviets and the Democratic Republic of Afghanistan (DRA). These factions differed in ethnicity and religious belief. Some were conservative Muslims, while others were more moderate. Some were ethnic Pushtuns, the majority, whereas some were Turkic ethnic minorities. Some were Sunni Muslims, others were Shi-ite. As a result, groups fought each other with the same fervor that they fought the Soviets.

An episode that illustrates their lack of cohesion and cooperation occurred when two DRA tank crews defected with their tanks, and two separate factions claimed the surrendered tanks. After several meetings, the compromise finally reached was that one faction would get the tanks' front halves, while the other faction got the tanks' back halves, thereby making it impossible to use the tanks in operations.[11]

Equipment and ability also differed between groups. Most groups started out armed with antique rifles. As more outside aid reached the guerrillas in Afghanistan and as more weapons were captured or bought, the arsenal of Mujahideen arms expanded. However, throughout the war, the Mujahideen lacked anti-tank and anti-aircraft weapons. Many of their heavier weapons were Peoples' Republic of China (PRC) copies of Soviet weapons. These included SA-7 AA missiles, RPG-7s, 14.5mm AA guns, some light mortars, and some rockets. However, these weapons were few and far between.

The majority of engagements were fought with captured small arms and light anti-tank weapons.

While the overall style of guerrilla operations remained the same, there was a definite difference in the level of professionalism between factions. Some were merely bandits, looking to capture arms to sell for currency, while others were more professional. The unit lead by Ahmad Shah Maasud, for example, had standing cadres of guerrilla fighters. His units were divided into *motoraks*, which were mobile striking units of about company strength, and *sabets,* which were local defense forces of about platoon size or slightly larger.[12] Massud was one of the few guerrilla leaders possessing the organizational skills required to train and sustain combatants in the field, away from their homes. Most Mujahideen were poorly trained and haphazardly organized. Massud was able to create specialized units, which allowed him much greater tactical flexibility and striking range.

The Soviets did not come to Afghanistan with the intent of fighting a guerrilla war. The Soviet concept was to fight a war of attrition. The Soviets would cut off supply lines, remove incentives for villagers to provide food for the Mujahideen (or simply remove the villagers) and whittle away the Afghan ability and will to fight. While this may seem an inappropriate way to fight the war, the Soviets were able to control the main cities, though much of the country through which their supply routes traveled was never permanently under Soviet control.

In the early years of the occupation, the doctrine used by the Soviet Union was the same as that which was developed to fight NATO in Europe. The Soviets relied heavily on mechanized forces and consequently were road-bound. Artillery and air support were heavily centralized. Moreover, there was very poor integration of artillery and air support assets with ground forces.

Centralization of command was a recurrent theme in Soviet doctrine. Junior officers and NCOs were discouraged from independent action, and were merely expected to fight their units in the ways that their commanders had prescribed. Soviet tactical manuals proclaimed, "The lower the level, the greater must be the degree of centralized control."[13] But the Soviets soon

discovered that counter-guerrilla warfare had to move faster then centralized control permitted.

Prior to 1982, the Soviets mainly used road-bound motorized forces to attack the Mujahideen, which led to immediate tactical problems. The roads in Afghanistan pass through valleys and gorges, so heights command either side of the road in terrain easily infiltrated by the guerrillas. When the Mujahideen attacked from these heights, the main guns on the BTRs and tanks did not have the elevation necessary to engage or suppress them. Most convoys consisted of T-55s or T-62s while the infantry rode in BTR-60s. While the vegetation was sparse, the rocks, draws, and wadis made perfect hiding places from which to ambush or snipe at the convoys.

Soviet doctrine was not entirely to blame. The Soviet soldiers were often reluctant to dismount from their BTRs, instead choosing to shoot from the firing ports of their vehicles, which provided inadequate visibility and range of motion to effectively engage guerrillas. More often then not, the guerrillas slipped away before the Soviets could hit them.

After 1982, the Soviets started employing more helicopter-borne troops. Helicopters allowed rapid insertion of Soviet troops onto the possible withdrawal routes of the Mujahideen. This allowed the Soviets to act as the ambushers and not the ones being ambushed. Soon, every third trooper was used in an air assault role, and by 1986, 70 percent of all Soviet operations were heliborne.[14] Increased use was also made of *spetznaz* or Soviet Special Forces units. These soldiers had more training and were generally considered better fighters. They could lay counter-ambushes and operate more independently than other Soviet troops.[15]

The increase in the use of heliborne troops did not completely eliminate the role of armor, which was still used, but only in a support role. Armor was still restricted to valley floors, and moved at a slow rate of speed. Heavy armor (consisting of tanks and BMPs) was found to be effective in forcing the enemy to withdraw. A good tactic was to have the armor push the Mujahideen out of a main valley and into smaller valleys and draws to escape. These smaller escape routes would be the site of ambushes laid by troops who had been inserted by helicopter.

This tactic worked well in the Panjshar 6 campaign in August-September 1982. The operation consisted of the landing of a large heliborne force towards which a mechanized column moved. The mechanized column moved on the valley floor, but smaller attacks were conducted up the side valleys, where heliborne forces had laid ambushes. This pushed the guerrillas either out of the valley or into the waiting heliborne forces. However, the smaller, side-valley attacks were not conducted with heavy armor, only by lighter vehicles, dismounted infantry, and heliborne forces. The attack was successful in that it broke the infrastructure of the Mujahideen in the area.[16] Five months later, the Mujahideen, led by Massoud, signed a truce in the valley.
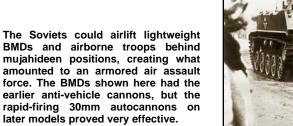
Another effective tactic combining armor and heliborne troops was the tactic of airlifting BMDs behind the enemy. This combined the firepower of a mechanized unit with the rapid movement of an air assault unit. The BMD allowed large volumes of firepower[17] to be brought to bear on a target. However, it was lightly armored, and therefore vulnerable to RPGs, so the Soviets would try to keep the Mujahideen at a distance from the BMDs while the Mujahideen would try to "hug" Soviet ve-

hicles.[18] The 30mm autocannon of the later model BMDs proved very popular, as it was more appropriate than the 73mm anti-vehicle gun.

The Mujahideen were not without anti-tank weapons. The most popular methods for attacking tanks were RPGs and mines. The RPGs had a range of only about 300 meters, but proved very effective against Soviet armored forces. A Mujahideen anti-armor team might consist of as many as 15 RPG-7 gunners,[19] although this was rare because RPGs were always in short supply.

Mines were also used, by both sides, as anti-tank weapons. The Mujahideen would acquire Italian mines or manufacture mines from dud Soviet bombs. The Soviets would search for mines by sending a mine roller-equipped T-55 ahead of their troop columns. To counter this, the Mujahideen employed mines rigged with pneumatic plungers, which gradually depressed a little more with each vehicle. Thus, the mine would explode in the middle of the column, well after the mine roller passed. However, the large size of anti-vehicle mines made them hard to hide. To discover mines made of plastic, the Soviets used search dogs.

Lessons Learned

The Soviets did not come to Afghanistan prepared to fight a guerrilla war. Their equipment was ill-suited, their doctrine was inflexible, and their command structure cumbersome. While the Soviets adapted to the situation, the adaptation was slow. They were slow to abandon their reliance on the armored formation. Even after a switch to primarily helicopter forces, they did not entirely get rid of the armor units. After 1987, when Stinger attacks made heliborne operations too risky, the Soviets reverted back to the slower, but more secure, armor tactics.

The Soviets could airlift lightweight BMDs and airborne troops behind mujahideen positions, creating what amounted to an armored air assault force. The BMDs shown here had the earlier anti-vehicle cannons, but the rapid-firing 30mm autocannons on later models proved very effective.

The command structure of the Soviet army worked well with large armor formations, but not so well at the small unit level. This was a shortcoming that seriously hampered their fighting in Afghanistan. The lack of initiative on the part of junior officers slowed down the tempo of operations, so guerrillas were able to escape before they could be decisively engaged. Moreover, co-ordination between the forward com-manders (often junior officers) and indirect fire assets was poor, and the artillery was slow to react. Attaching a 120mm mortar carrier at a lower level allowed the junior commander quicker access to fire suppression. Another suc-cessful adaptation was the use of the AGS-17 automatic grenade launcher. This crew-portable weapon provided readily accessible indirect fire support.

The ability to saturate an area with fire seemed to be a successful Soviet tactic. The 73mm guns on BMPs and BMDs were replaced with 30mm auto-cannons, which were more effective in laying down large volumes of fire. The ability to generate long-range suppres-sive fire was more important to the Soviets than anti-armor capabilities. Another effective weapon was the tracked ZSU-23-4. Their four 23mm guns were used with great effectiveness against infantry, especially in cases where they were firing on infantry high above them. The Soviets suffered from the constant problem of not being able to elevate their guns enough to engage guerrillas on the high ground. One solution was to use the commander's roof-mounted machine gun, but this exposed the commander to small arms fire and distracted him from the job of leading the tank crew.

No matter what firepower was brought to bear, tanks never gained the initia-tive against the Mujahideen. There were no lines to smash through, no objectives to overrun. Even the princi-ple of mass did not seem to apply. What worked against the guerrillas were weapons that robbed them of ini-tiative and denied them movement. The anti-infantry systems of BMPs and BMDs, coupled with high volume weapons, such as the ZSU-23-4 or the AGS-17, were more effective in this type of conflict than the main gun of a T-55 or T-62. The Soviets found their heavy armor more of a liability than an asset, while they found their lighter armor much more effective.

The Soviets employed the ZSU-23 air defense weapon against guerrillas perched high along mountain passes because the four 23mm machine guns, designed to hit planes, could elevate sufficiently where tank guns could not. Recently, this weapon was also found useful in engaging snipers in tall buildings in Chechnya.

South Lebanon: 1985-2000

South Lebanon is a good place to be a guerrilla. The hills, wadis, draws, and forests allow for unobserved movement and quick escape routes. The PLO used this terrain to their advantage in escap-ing the IDF invasion in 1982,[20] and in 1985, after Israel had withdrawn from most of Lebanon, the Israelis created a "security zone" running across South Lebanon to keep PLO guerrillas from attacking settlements in northern Israel. The security zone was 1200 square kilometers in area, but not quite deep enough to put the northern towns of Israel out of Katushya rocket range. There were several towns in the secu-rity zone, the largest being Jezzine, in an area controlled by the South Leba-nese Army.

At first, Israel garrisoned about 1,500 troops in Lebanon at any one time. This number increased to 2,000 in 1997,[21] with troops spread out in outposts of various size throughout the zone. The guerrillas facing them were mainly from the Hizbullah (party of God) in South Lebanon. The Hizbullah, a Shiite Muslim group, was dedicated to remov-ing Israel from South Lebanon and numbered about 1,500, with 200-300 active at any one time and the rest re-servists. These guerrillas operated with a high degree of compartmentalization and independence, so that the Hizbullah leadership in Beirut, in some cases, would often be unaware of the opera-tions of a particular Hizbullah cell until they read about it in the papers.[22]

The Hizbullah operated on secure lines of communication, but also re-ceived outside help. Iran supplied both weapons and training, thus Hizbullah did not suffer the traditional guerrilla problem of insufficient armament or supplies. Hizbullah units would mobi-lize, move across the border into the security zones, and then withdraw, making them hard to catch within the cities of the security zone.

The decision to use more tanks in the Lebanon occupation came in 1987.[23] The tanks' original mission was to seek out and kill the Hizbullah, and for about a year, this tactic was effective. They would accompany APCs on pa-trol, engaging the guerrillas with anti-personnel rounds, mainly flechette rounds. Additionally, the tanks would assume an overwatch position from Israeli encampments. Ground surveil-lance radars (GSR) and the thermal imaging and targeting system of the Merkava made it possible to track the guerrillas and direct dismounts or call for indirect fire. However, after about a year, the tanks were no longer succeed-ing against the guerrillas.[24] They had learned that the Merkava had a range of about 4,000 meters, so they would then move outside the firing arc of the sta-tionary tanks. However, this was not a complete loss to the Israelis. Knowing that the Hizbullah would move only outside the firing arcs of the Merkavas, the IDF could canalize the movements of the Hizbullah by the placement of their tanks, and reduce the infiltration routes that the Hizbullah could use.[25]

In addition to overwatching static Is-raeli outposts, tanks also overwatched mounted patrols. Usually, the Israelis would send out a patrol of an APC and a tank or perhaps two tanks. The tanks

Note the extent of modifications to this Israeli M113, which is hardly recognizable as such. An armored turret, extra machine guns, reactive armor, anti-RPG plates, and a battery of smoke grenade launchers were added for protection against guerrillas, but ultimately, even these changes proved inadequate, leading to the modification of obsolete tanks as a more survivable solution.

battle-carried flechette rounds, and took turns in overwatch positions. The APCs would dismount the infantry to secure the area. The terrain of South Lebanon made for short overwatch ranges of usually less than a kilometer.

The infantry patrolled in a number of vehicles. In 1982, when they entered Lebanon, Israeli mechanized infantry rode to battle in up-armored M113s, but Israel found the design lacking if not deadly because of vulnerability to shaped-charge weapons like the RPG-7. A new, more survivable vehicle was sought, and since Israel did not require the same deployability weight limits as the U.S., it was decided to convert obsolete tanks into armored personnel carriers. The Israelis also understood that these patrols would be road-bound. Moreover, the Israelis used their APCs to secure routes, and understood the road-bound nature of tracked vehicles in South Lebanon, thus Israel sought survivability over all else in the design of its APCs. Two designs emerged as suitable APCs, the *Nagmahon* and later, the *Nakpadon*, both based on a modified Centurion tank.

Both are heavy APCs, and both are armed with light machine guns, since the main targets were infantry, not light armored vehicles, and the main threats were mines, ATGMs, and RPGs. Therefore, protection, not speed or firepower, was the main operational requirement,[26] with heavier firepower provided by the tanks in the overwatch position. The design of the two APCs was based on the operational requirements of Lebanon, which meant short-distance patrols. The Hizbullah fought using hit-and-run tactics, only presenting themselves long enough to fire at the Israelis with anti-tank weapons and then withdrawing, so Israel did feel the need for a traditional IFV, in the sense of a BMP or Bradley. Moreover, cross-country mobility was not seen as necessary. Israel used its armored patrols to secure routes and move troops, not assault the enemy. Therefore, the slow, heavily armored, but lightly armed APCs were more suitable than faster, more heavily armed, but more vulnerable, IFVs.

For the most part, Israeli armor was static. The role of the tank was surveillance and overwatch, since Hizbullah had no vehicle capable of facing a Merkava. Israel did conduct armored patrols, which tended to move along well-established routes, and this had two detrimental effects. The first was that Hizbullah could predict where Israeli forces were moving, and occasionally even when, which resulted in Israeli casualties, even on patrolled routes. For example, on the route from Marjayoun to Beaufort Castle, Hizbullah repeatedly set up Sagger ambushes. The other detrimental effect was that the patrolling was limited to established, predictable routes, so Hizbullah had great freedom of movement outside these areas. Thus, Hizbullah retained the initiative.

While Israel had uncontested control of the skies and made use of fixed and rotary wing aircraft, both weapons systems did little to stop guerrilla attacks on IDF positions.

In 1995, Israel started using a special heliborne unit called an *Egoz*, or wal-nut.[27] These units operated by crossing over the border of the security zone and into Lebanon proper. The Egoz would be inserted by helicopter and then set up ambushes along probable infiltration routes. The Egoz did have some success, but they did not turn the tide of the war. The use of Egoz may have been a morale booster as much as an attempt to stop Hizbullah attacks.[28] Nevertheless, they did not completely prevent Hizbullah attacks and suffered losses of their own.

The enemy that the IDF faced was not an enemy in the traditional sense. Hizbullah did not have a division to encircle, it did not have a command center to destroy, and it did not have an air force to neutralize. However, they were still able to inflict losses on Israel, albeit not with impunity. The Hizbullah used the guerrilla tactics of raids and ambushes. There was a shift in the patterns of attack in 1990-91. In the late '80s, Hizbullah attempted human-wave style assaults, which brought high casualties.[29] After 1991, the attacks became more disciplined. Assaults were made with two units, an assault unit and fire support unit. The fire support units were able to zero in their 81mm mortars within two ranging rounds, and the planning that went into Hizbullah operations mirrored that of their adversaries, with dedicated staff work and intelligence collection.[30] While these were effective force multipliers for the Hizbullah, the fact that they constantly had the initiative is what allowed them to be so successful against the IDF.

Two types of attacks were used against armor units. The first was the ATGM or RPG attack. The ATGM was favored because of its obvious range advantage and destructive capability. The ATGM attack would take place at a significant range so as to minimize risks to the firing teams. The Hizbullah made widespread use of the AT-3 Sagger, but towards the end of the war, they also employed the AT-4 Spigot, which had the advantage of flying faster and being harder to spot than the slower-moving Sagger. Additionally, the Hizbullah also made limited use of U.S. TOW ATGMs.[31] The ATGMs were used against armored units as well as command posts where the ATGMs could "literally be guided through the observation ports of heavily fortified and otherwise impregnable positions."[32] The IDF countered the attacks on ob-

servation ports by installing fences over the ports.

Another tactic of the Hizbullah was the roadside bomb (RSB), essentially a form of mine, along with conventional anti-personnel and anti-vehicle mines. Some well-camouflaged claymore-style mines were hidden in a fiberglass shell that was painted to match the surrounding rocks. These mines could be command-detonated by wire, radio signal, or cell phone, the latter being preferred because wires could be spotted and radio signals jammed. The IDF also employed APCs equipped with jammers to neutralize the command-detonation frequencies.[33] Additionally, special anti-mine Centurions were used, as well as dogs, to ferret out mines. IDF sappers searched for mines wearing special shoes that distributed the weight of the sapper so as to reduce his ground pressure.[34]

Roadside bombs were very effective. It is estimated that half of all such attacks succeeded, and 16 of the 24 IDF soldiers killed in 1998 were killed by RSB.[35]

While Israel did have initial success in using its tanks to seek out and kill guerrillas, their effectiveness diminished as Hizbullah learned their adversaries' tactics. Nevertheless, Israelis did have some success in using the sensor suites of their tanks to help locate guerrillas. Moreover, tanks were the main firepower on patrol for the IDF.

The Merkava, the *Nagmahon,* and the *Nakpadon* were all heavily armored at the expense of speed. However, speed was not an issue; protection was. (I personally know an IDF platoon commander who was hit with a TOW missile while he was commanding his platoon of Merkavas.[36] A scorched eyebrow was the extent of his injuries.) IDF armor was meant to keep the crew alive above all else, but armor alone was not sufficient to stop the Hizbullah. The Egoz units attempted to attack the Hizbullah on their terms, but the military success of these units is debatable. In the end, the IDF was still required to withdraw.

A low-intensity conflict is a contest of wills. Hizbullah sought to sap Israeli resolve and demoralize them. Thus, the psychological boost of the Egoz successes was probably more effective than the number of Hizbullah they killed.

The use of mines and roadside bombs was a problem not unique to Lebanon. If anything, the South Lebanon fighting showed that a cheap, easy-to-use, readily available weapons system could cause a considerable amount of damage. The Israelis ran into the same problem as many other armies facing modern mines — detection. The use of plastics has made mines harder to detect. Mine clearing operations were not always effective. The use of highly trained sappers and dog teams helped, but these units are vulnerable and their use is time-consuming. They can turn into more of a liability than an asset.

Lessons Learned

Israel first decided to use tanks as a way of defeating the Hizbullah, but after a year of use, they found that the tank was not effective. This was not because the tanks became any more vulnerable, but because the Hizbullah became less so. The Hizbullah's learning curve, learning to defeat the firepower of the Merkava by staying out of its range, was much steeper than that of the IDF as it tried various tactics to employ its armor. Ultimately, you could say that the use of tanks led to a sort of Catch-22: the tanks were meant to protect more vulnerable targets, but required many units to support them. Thus, the use of tanks also increased the number of vulnerable targets in the theater of operations.

Finally, part of the reason Israel seemed unable to prevent attacks was that it never really gained the initiative. Tanks present a high-signature. In restricted terrain, it is difficult for tanks to capitalize on the element of surprise. Thus, IDF tanks were always reacting to what the Hizbullah had done, while the Hizbullah would decide when and where to attack.

Armor units were not without merit. The Merkava's protection is excellent. Certainly, more troops would have died had they not had the protection of heavy armor. However, the troops required to support the Merkava were also at risk. Israelis found that tanks were not undefeatable giants of the battlefield. Rather, the Israelis found that without initiative, tanks were neutered of their combat prowess.

Lessons for the U.S.

The U.S. won Desert Storm decisively. However, the occurrence of a similar war is not likely. Mechanized

armies are expensive. Moreover, no country would stand a realistic chance for victory against U.S. mechanized forces using mechanized forces of their own. U.S. tanks have killing ranges of almost four kilometers, and can shoot on the move at speeds of almost 100 km/hr. U.S. tanks can see in all types of weather, day or night. But U.S. tanks weigh 70 tons, get roughly ½ mile to gallon on good days, and have no ability to separate guerrilla from civilian. Moreover, they are big. The Abrams is almost 8 meters long, 3.6 meters wide, and 2.4 meters tall, with all the stealth of a rhinoceros.

In the two examples above, tanks never seemed able to gain the initiative. Granted, both Afghanistan and Lebanon were considered "restrictive terrain," but I think it is unfair to blame terrain. A guerrilla operation, by definition, requires that the terrain be favorable to defense and ambush-style operations, or the guerrilla movement is short-lived. Therefore, I believe that it is safe to assume that a future guerrilla conflict with the U.S. could very likely take place in an area which is not suited for tanks, or IFVs for that matter.

That said, nothing makes a statement like a tank. While the 70-tons of tank may be hard to move, it is also hard to kill. While killing an Abrams, even with modern ATGMs, is not easy, infiltrating past one may prove much easier. Therefore, you need infantry, and infantry require APCs, or IFVs. These are easy to kill, and are about as big and as noisy as tanks. Both the Bradley and the new LAV III can be disabled if not killed all-aspect by widely available improved RPGs. So, does armor belong in the U.S. LIC order of battle? I believe that it does, in a limited role.

The armor branch of the U.S. Army bills itself as "The Combat Arm of Decision," but because of the nature of LIC, the tank is not decisive. The traditional role of "close with and destroy the enemy" is not a role armor should play in LIC. The role of armor should be where it is most effective, in support. The Israelis had the most success with their armor using it in overwatch. Their sensors and machine guns were a great help in identifying and attriting the enemy, after the enemy attacked. Tanks are effective as reactionary forces. Except for certain weapons, they can absorb hits from small arms with no difficulty. Thus, infantry can be as-

sured of supporting fires against the small arms fire of the enemy. Additionally, they can use the tank as cover.

However, in a close-in fight, the advantages of a tank are more limited. When a tank receives small arms fire, the only weapons safely available are the main gun and the coax machine gun. The effectiveness of the main gun is further reduced as there are very few rounds that can be fired safely near supporting infantry. The U.S. does not yet field a 120mm flechette round, so the main antipersonnel weapons system that a tank provides is its 7.62mm machine gun. I do not wish to belittle this, as a mobile machine gun position is still a great boon to friendly infantry, but it is a 70-ton, four-person, 7.62mm machine gun. The Soviets found great success in using their auto-cannons and anti-aircraft guns to effectively "hose" an area. The Bradley has a 25mm cannon, but it is very vulnerable in a close-in fight, as it is susceptible to anti-tank rockets and grenades to a much greater extent than an Abrams is; quite a dilemma.

Thus, the overwatch position for tanks seems to be the best role. That way, the tank can engage with all of its weapons systems, and still be out of most small arms range. Moreover, the Abrams was not designed for close integration with infantry. The exhaust is hot enough to cause burns, so infantry cannot safely find cover behind it. Additionally, the tank has no integral phone to permit the infantry commander to talk to the tank commander. It may seem like a small thing, but trying to communicate through the depleted uranium shell of an operational tank is not an easy task.

The Soviets found that tanks would work if screened and supported by heliborne infantry. I would assume that the same would work for U.S. armored forces. They could be deployed if they were used in conjunction with light infantry. However, the most successful use the Soviets and the Israelis made of their tanks was when the infantry was used as the finding and fixing force, while tanks were used as either fire support or as an "anvil" in hammer-anvil style tactics, the infantry "hammer" pushing guerrillas towards the armor "anvil." The U.S. made use of this tactic in Vietnam in cordon and search raids.[37] However, using infantry to screen for tanks where the tanks are being used in the role of seeking contact with the enemy seems counterproductive. The paradox of LIC is that

an increase of troops is not necessarily a good thing. Usually, the stronger side already has dominant numbers of troops and firepower, so the marginal gain of combat strength (in this case, heliborne troops) is not so great. Rather, the increase in the number of troops increases the signature of the stronger side and increases the number of available targets for the guerrillas.

The U.S. seems to have addressed the problem of gun elevation which plagued the Soviets. The 25mm cannon of the Bradley can be elevated up to 60 degrees, but the main gun and coax of the Abrams can only be elevated to 30 degrees.[38] The LAV series of vehicles can be fitted with a 25mm auto-cannon which can also be elevated to 60 degrees. Additionally, the Soviets found that the AGS-17 automatic grenade launcher was a very good weapon for providing immediate suppression of guerrilla forces, making their escape harder. The U.S. does fit the Mk-19 automatic grenade launcher to HMMWVs, though the vehicle is not really heavy enough to support the kick of the weapon. The new family of LAVs, however, could easily mount a Mk-19, giving a local infantry commander organic, indirect fire against lightly armored targets, like withdrawing guerrillas. Both the Mk-19 and the 25mm auto-cannon have ranges of over 1000m. Nevertheless, it is conceivable that an enemy would try and "hug" U.S. forces and remain close enough to use RPGs against thinly skinned vehicles. More-

over, if a fight is taking place in restricted terrain, finding support-by-fire positions of over 300m (the range of the older RPG-7) will be a rare thing. Thus, the LAV is not a perfect solution. While it provides firepower, it could still prove a liability.

There is no real doctrine for using U.S. Armor in a low-intensity conflict. There is some indecision about how to use tanks and IFVs most effectively. Current Center for Army Lessons Learned (CALL) newsletters have tanks being used as both a finishing force and as a support force.[39] There is some assumption that the mere presence of tanks alone will be enough to scare the enemy into not making contact:

"An unconventional enemy may be quite willing to make contact with infantry, but will avoid contact with infantry accompanied by tanks, in many cases."[40]

This is not a quote from a field manual, but rather a more current, though less official, take on tactics and techniques of light and heavy integration. Nevertheless, I think it shows the belief that the enemy's fear of tanks is innate and will keep them from targeting tanks, or even making contact with U.S. forces. While ATGMs are advanced weapons and difficult to obtain, they are not impossible to acquire. Both the Hizbullah and the Mujahideen were able to acquire wire-guided missiles, albeit the latter did so much less frequently than the Hizbullah.

Photo: Mike Green

The Bradley's cannon can elevate to 60 degrees, whereas U.S. tank guns can't elevate over 30 degrees, a drawback in mountain and city fighting.

Mines are much cheaper; a tank killed by a mine is as dead as a tank killed by a missile. Mines are a particular threat to the U.S. forces. First, their availability makes it almost certain that U.S. forces will face them in a future LIC. They are relatively cheap and easy to use, considering the damage they cause. Mines can also be made from dud artillery shells, bombs, or merely explosives bought in bulk.

Moreover, U.S. mechanized forces will be highly dependent on roads and road networks. The supply and logistics of keeping any vehicle operating in the field are enormous, and U.S. forces will require roads to keep the tanks and APCs running. While the tank may not be very vulnerable to mines, a truck will be. At Ft. Polk, the U.S. Army training center for low-to-mid intensity conflict, mines are the second largest casualty producer next to small arms.[41] Both the Soviets and the Israelis faced huge problems with mines in their respective conflicts, and each developed usable anti-mine doctrine. Both countries used tanks with rollers to proof lanes of advance. The U.S. does the same thing, searching for mines with a plow tank. When contact with a mine is made, engineers move forward to clear the minefield, while light infantry take up overwatch positions to secure the flanks. Then the column of troops reassembles and moves on. I think this technique is counter-productive in LIC. While it seems to make sense that engineers would clear mines once found, and infantry would provide security, the clearance procedure provides a very large stationary target. A possible enemy scenario might involve a dummy minefield with one real mine, the one the tank plow triggers on the road. The U.S. units stop, engineers move forward, and infantry take up security positions. Suddenly, mortar shells rain down on the engineers and on the infantry in security positions. The targets, probable security positions, and the dummy minefield could be pre-registered targets. After firing off three to five rounds, the guerrillas withdraw, leaving the U.S. forces with casualties, their progress frustrated. This, of course, would not be enough to destroy a U.S. unit, but in LIC conflict, it doesn't have to be. Guerrilla efforts are not decisive, but slowly attriting.

I would propose that engineers be attached at as low a level as possible in LIC, possibly a section of sappers per platoon of mechanized infantry or ar-mor. The idea would be to create a smaller overall unit capable of doing the same job, but offering a smaller signature. Beyond that, we need to improve mine detection techniques. Induction mine sweepers are fairly ineffective as most mines are encased in plastic nowadays. To overcome this, both the Soviets and the Israelis made use of dogs to search out mines, though the U.S. does not seem to do this. There is a gap is U.S. mine-detection ability. Mine detection, clearing, and security of routes is something the we need to solve, if a solution exists.

The purpose of this paper was not to try to rewrite U.S. doctrine, since we have very little doctrine on tanks in LIC to begin with. This is not necessarily a bad thing. The nature of LIC is such that most preconceived doctrine is useless. However, the purpose has been to examine the major tactical lessons learned by two armies faced with LIC, and apply those to current U.S. thinking. My conclusion is that main battle tanks have little role in a low-intensity conflict. They are wonderful against other tanks and unsupported infantry, but against highly mobile, hit-and-run guerrillas, tanks are less effective. They offer great protection, but at the cost of initiative. Moreover, while the tank may be a difficult target, the support and logistical units necessary to keep a tank running bring many more, vulnerable troops into the kinds of conflicts where a low-signature is a great asset. Additionally, the weight and bulk of tanks is such that they are restricted mainly to roads. That said, I believe that a lighter, more mobile vehicle is more suitable, and I do not believe the Bradley or the M113 fits this description. Both are too heavy and suffer from many of the same mobility constraints of an Abrams. Instead, I am in favor of the LAV series of vehicles, currently used by the USMC and the Interim Brigade Combat Teams (IBCT) now training at Fort Lewis. LAVs are easily modified with a variety of weapons systems, making them easier to tailor to given combat situations.[42] Moreover, the ability to carry nine soldiers, as opposed to the six of a Bradley or zero of an Abrams, allows for more flexible composition of platoons and squads, the meat and potatoes units of LIC.

I do not propose that we form a motorized army similar to that of the Soviets with their BTRs. These vehicles did not perform well in Afghanistan until troops started dismounting. I would expect that U.S. troops would be more willing to dismount, as the LAV lacks the firing ports of the BTR series. However, I believe the use of a lighter, more flexible platform, such as the LAV, will help bring additional firepower to the fight, with overall less operational risk (albeit more vehicle risk than an Abrams). The LAV approach is different from the heavily armored approach of the Israelis, but, the U.S. does not have the ability to drive to its theater of operations, so the weight of armor does not serve us if we cannot get it to the fight. Also, their heavy APCs were meant for protection, not fighting.

The use of the LAV is not a cure-all. LAVs still require in-theater logistics and maintenance support, though not as much as an Abrams. Additionally, they offer much less protection than an Abrams and do not solve the U.S. weakness in counter-mine warfare. The fix to that problem will hopefully come through trial and error in training, as will effective methods for using the LAV in LIC. However, I believe the LAV more suited to the job of LIC, if the U.S. insists on using mechanized forces. Both the Soviets and the Israelis seem to have had more success with pro-active heliborne troops, versus reactionary armor troops. Still, politics, rather than military necessity, often determines who and what is sent to war. That said, no Army has come out of a LIC better off than when they went in. Yes, valuable lessons were learned, but at a terrible cost in institutional pride and, more importantly, lives lost. Ultimately, the most effective doctrine for low-intensity combat is to avoid it.

Notes

[1]Professor Martin Van Creveld, *Defense of Israel,* Rothberg International School, Hebrew University, Jerusalem, 2000-2001.

[2]I will use the terms "armored forces" and "mechanized forces" interchangeably.

[3]The Soviets differentiated between mechanized infantry and motorized infantry. Mechanized infantry rode to battle in tracked IFVs like the BMP, whereas motorized infantry rode to battle in wheeled APCs, like the BTR-60. Unless otherwise noted, I will use the term mechanized infantry throughout to refer to both.

[4]Mark Urban, *War in Afghanistan* (London: MacMillan Press, 1988), p. 5.

[5]Anthony H. Cordesman and Abraham R. Wager, *The Lessons of Modern War, Vol. III: The Afghan and Falklands Conflicts* (San Francisco: Westview Press, 1991), p. 4.

[6]Michael R. Matheny, "Armor in Low-Intensity Conflict: The Soviet Experience in Afghanistan, Part 2," *ARMOR,* September-October 1988, p. 6.

[7]A. Cordesman and A. Wagner, p. 11.

[8]M. Matheny, p. 7.

[9]Mark Galeotti, *Afghanistan: The Soviet Union's Last War* (London: Frank Cass, 1995), p. 202.

[10]A. Cordesman and A. Wagner, p. 8.

[11]M. Urban, p. 125.

[12]M. Urban, p. 101.

[13]Lt. Gen. V. Reznichenko, as quoted by M. Urban, p. 65.

[14]A. Cordesman and A. Wagner, p. 62.

[15]M. Galeotti, p. 191.

[16]M. Urban, p. 109.

[17]The BMD-1 has three 7.62 MGs with a 73mm main gun. Later models had a BMP-2 turret with a 30mm cannon. This proved the more popular design. Source: Christopher F. Foss, *Jane's Tanks and Combat Vehicles Recognition Guide* (New York: Harper Collins, 2000), p. 178.

[18]Lester W. Grau, "The RPG on the Battlefields of Today and Tomorrow," *Infantry,* May-August 1998, retrieved from the Center for Army Lessons learned *www.army.call.mil.*

[19]Ibid.

[20]Martin Van Creveld, *The Sword and the Olive* (New York: Public Affairs, 1998), pp. 292-293.

[21]Ed Blanche, "A bizarre yet bloody conflict drags on in South Lebanon: part 1 of 2," *Jane's Intelligence Review,* September 1997, p. 414.

[22]Ibid.

[23]Interview with Col. Shomel Nir (Semo) IDF, Intelligence Officer for S. Lebanese Forces 1993-1995. Conducted in his home on June 10, 2001.

[24]Ibid.

[25]Ibid.

[26]Marsh Gelbart, "Achzarit, Israel's Assault Solution," *Jane's Intelligence Review,* July 1997, p. 317.

[27]Ed Blanche, "A bizarre yet bloody conflict drags on in South Lebanon: Part 2 of 2," *Jane's Intelligence Review,* October 1997, p. 457.

[28]Ibid.

[29]E. Blanche, Part 1 of 2, p. 414.

[30]E. Blanche, Part 1 of 2, p. 414 and Part 2 of 2, p. 462.

[31]Augustus Richard Norton, " Hizballah and the Israeli Withdrawal From Southern Lebanon," *Journal of Palestinian Studies,* August 2000, p. 30.

[32]Ibid.

[33]E. Blanche, Part 2 of 2, p. 460.

[34]Col. Shomel, June 10, 2001.

[35]Nicholas Blanford, "Hizbullah attacks force Israel to take hard look at Lebanon," *Jane's Intelligence Review,* April 1999, p. 34.

[36]This incident was told to me by CPT Rely Margilit, IDF Armor Corps, who was the most recent manager of the Merkava project for the IDF and served as a platoon commander in Lebanon.

[37]Michael R. Matheny, "Armor in Low-Intensity Conflict: The American Experience Vietnam, Part 1 of 2" *ARMOR,* July-August 1988, p. 15.

[38]C. Foss, p. 212.

[39]CALL newsletter on light-heavy integration, retrieved from Center For Army Lessons Learned website *www.army.call.mil.*

[40]Ibid.

[41]Briefing on Route-Clearing, CTC Newsletter, CALL website.

[42]Scott Gourley, "U.S. Army selects medium armored vehicle," *Jane's Defense Weekly,* 22 November 2000, p. 3.

2LT Noah Kanter was commissioned in 2000 from Cornell University. After Cornell, he attended graduate school at Hebrew University, Jerusalem as an Anna Sobol Levy Fellow. As part of the Fellowship, he worked with the IDF while he was in Israel. He currently attends the Armor Officer Basic Course and will serve with the 1-4 CAV upon graduation.

COMMANDER'S HATCH from Page 5

command and be tenacious in checking and rechecking for compliance. They must ensure their subordinate leaders possess this same trait. If leaders focus on a safe working environment, everyone will. We must emphasize that safety is everyone's responsibility. Safety isn't just following rules; it is knowing where you are and what you're doing at all times. This is situational awareness (SA) and it's everyone's responsibility. SA is not just understanding where you are on the battlefield; it is understanding where you are in the tank and what you are doing. It is knowing where the breech is and where your body is in reference to the breech; it is knowing where all your crewmembers are when you move the turret. Situational awareness is everyone's business.

Safety has always been a number one priority in any training event or exercise because the most valuable asset in our Army is the soldier. In the early days of World War II as our nation prepared for the biggest military challenge in its history, General George C. Marshall, Army Chief of Staff, said, "The primary instrument of warfare is the fighting man. All of the weapons with which we arm him are merely tools to enable him to carry out his mission." This still holds true today. We must continue to find ways to protect our most valuable asset. I challenge each of you to set the example that reinforces the standard, provide leadership and instill discipline that may prevent future accidents to protect our most valuable asset — our soldiers.

The U.S. Army, the Armor Association, the Patton Museum, *ARMOR* Magazine, and "tankers" and cavalrymen everywhere lost a good friend and stalwart supporter recently when MG (Ret.) Stan Sheridan passed away. Few devoted as much time and effort supporting the Armored Force as this mounted warrior. He served his country in uniform in war and peace for over 32 years, and then kept on serving for 18 years as Director of the U.S. Cavalry Association, Vice President of the U.S. Armor Association, Board of Trustee member of the Patton Museum, Honorary Colonel of the 69th Armor Regiment, and Gold Medallion holder in the Order of Saint George. These are just some of the titles and honors earned by Stan Sheridan. You know it's easy to support the Armored Force while one wears the uniform; it's a form of self-preservation. But General Sheridan, and others like him, who did it and do it while retired, are special men indeed. These men work tirelessly to keep our heritage alive, passing it along to new generations of tankers and cavalrymen. They remember and celebrate fallen comrades and their accomplishments while mentoring and supporting the "new breed." They deserve our gratitude and respect — there are too few of this ilk.

FORGE THE THUNDERBOLT!

(Editor's Note: CSM Carl Christian also contributed to this column.)

Cavalry for the Interim Force

A Proposal for the 2d Cavalry Regiment

by Colonel Kevin C.M. Benson

The most important event in recent Army history occurred on 11 September 2001. Declared by act of Congress or not, the nation is at war. In light of this reality and compelling, changing threats to the nation, our Army, well underway in the process of transformation, must adapt transformation to the reality of a "wartime Army." Our Army is converting two brigades, one heavy and one light, into Interim Brigade Combat Teams. The recently released Quadrennial Defense Review (QDR) directed the Army to put a seventh Interim Brigade Combat Team in Europe by 2007. On 12 July 2001, the Secretary of the Army and the Chief of Staff of the Army reinforced the momentum of transformation with the announcement of the next four brigade-sized formations slated for transformation into the Interim Force. One of these formations is the 2d Cavalry Regiment.

The Interim Brigade Combat Teams (IBCTs) are combined arms formations of infantry, cavalry, artillery, combat support, and combat service support units. These brigades are equipped with Light Armored Vehicles and will enjoy a significant mobility differential over potential adversaries. The digital information and communications systems, so called C4ISR or command, control, communications, computers, intelligence, surveillance, and reconnaissance, within the brigades give them an equally significant information advantage over potential adversaries. The future of the Interim Force is full of challenges, ranging from refining the training model that will sustain both mounted and dismounted maneuver skills and sustain a level of proficiency in the digital realm, to deployment into active theaters of operations as the Army must demonstrate the worth of the Interim Force to regional commanders-in-chief (CINCs).

In light of this momentum toward the Interim Force, and its inherent bridge to the as-yet defined Objective Force, we must ask, and indeed forcefully propose, what the role of cavalry is in the Interim Force — and by extension, the Objective Force. The Interim Force serves a two-fold purpose, meeting a near-term strategic need for regional CINCs and acting as a bridge to the Objective Force by refining solid, digital operating and fighting techniques. The purpose of this essay is to propose an operational role for the 2d Cavalry Regiment as Interim Force cavalry and a viable table of organization for the regiment that can fit into the war footing of the Army and contribute to that effort relatively swiftly.

While we all may think this is a "new" concept, a glimpse into the history of our Armored Force revealed this from the pages of the 1924 *Cavalry Journal:*

"General Carbon, I think the battle is ripe. Direct the 2d Deathbolts to charge the enemy left." So are the fates of nations settled! By this simple order, Lieutenant-General Alonzo B. Gasoline, seated at his green-lit desk in the gas-proof seclusion of his command car loosed the two million pounds of petrol-propelled hate on the tottering flank of our doomed opponents. But how can a human Dictaphone describe the inspiring majesty of the sight which unfolded itself before our eyes on the screen of our radio motion-picture projector, whose lense, high above us in the observation helicopter, commanded a complete view of the battlefield? (Patton, p. 5, "Armored Cars with Cavalry")

Just when you think there is a new concept — UAVs with sensor support and instant communications — George Patton was there first! Of course, his article is actually focused on how armored cars could enhance the role of horse cavalry.

Patton also introduces another difficulty Army officers of all ages contend with. In Patton's words, "the heartless shears of Fact and Finance… prune our fancies." We, too, must remember the cost of transformation as our Army programs contend with the F-22, Joint Strike Fighter, and DD-21 programs.

Why Cavalry? Before 11 September, strategists predicted an era of violent peace, relative calm in which America's vital interests are not directly threatened. In the post-Cold War world and in the aftermath of the 11 September 2001 attacks, we may have to re-evaluate this prediction. Threats, potential and real, to an orderly world have and will continue to emerge. America, with allies or partners, will act to deter aggressive action or decisively defeat enemies who threaten tranquil order. Thus, the cavalry of the Interim Force needs to have utility across the spectrum of conflict. A full-spectrum force is one that can be employed effectively in any form of conflict from humanitarian support to high-intensity combat. The regiment, therefore, must be a force that has the technical and tactical capability to operate over large distances and sustain a higher commander's operational picture while having the inherent combat capability to act with power and decision.

The higher commander's decision-making paradigm in the information age begins with situational understanding. The regiment, therefore, requires a mix of sensors and scouts, air — both manned and unmanned — and ground. The sensors find moving target indicators and the scouts confirm or deny enemy activity. The sensors serve as a means of focusing the efforts of the scouts of the regiment in the regimental battle space. The regiment also requires enough combat power, in the form of direct fire weapons, to destroy enemy forces, and laser designators that allow the regiment to fight effectively with air power.

Why Cavalry? The emerging reality is a struggling economy, budget trade-offs and compromises, and a changing security strategy. The security strategy outlined in the QDR will require us to conduct some operations as an economy of force, but that force executing the mission must still have the combat power to deter or finish a fight. Small-scale contingencies, SSCs, will still require combat power supported by equally powerful C4ISR. So cavalry will still play a vital role in an emerging strategy where we have the means

to decisively finish one fight while deterring or holding in other theaters, or conducting SSC. The small, yet violent, wars of the future will most likely be more like Kosovo and less like Desert Storm. There will also be a focus on avoiding a large-scale commitment of ground troops, except when necessary. We will also continue our predilection toward the use of precision guided munitions and precision strike operations.

The operational architecture required to conduct operations in this type of shifting environment will be a robust mix of tactical and operational C4ISR devices. A full-spectrum force engaged in a strategic economy-of-force mission may well be the only Army force on the ground. This will mean, effectively, that the regimental commander will be his own ARFOR commander and respond either directly to a joint force commander or that commander's ground component commander. A theater economy-of-force mission is tough to define in terms of kilometers, but for the sake of force structure, and realizing the limitations of existing C4ISR devices, the regiment must be able to operate over an area close to 100 x 100 kilometers. The systems architecture that will make this possible must be equal to the task and provide a robust backbone with alternate means of communication.

In the supporting technical systems architecture, the regimental headquarters will require the Global Command and Control System-Army, or GCCS-A. This device will serve as the regimental commander's portal into the joint command and control systems, and his means to execute reach operations for maneuver support.[1] The systems architecture built for the operations architecture briefly described above will require the regiment to own the full range of the Army family of C4ISR devices that support command and control, maneuver, combat service support, intelligence, air defense, and the common ground station links for access to JSTARS/ AWACS and UAVs. The regiment will need satellite communications systems in all of the squadrons, and to have a sufficient reserve to enable the regimental commander to place SATCOM in selected troops of the regiment if the mission requires it.

The supporting systems architecture will also enable the regiment to have access to expanded information databases that support the full range of reach operations in all battlefield functional areas. The regimental S2, for example, must be able to reach into the joint intelligence data base with assured links.

While the regimental command and control structure must be robust enough for operations in support of a corps or JTF, the squadrons will not require the same range of devices as regiment. In order to operate decisively and swiftly over large areas, the squadrons must rely on the regimental signals backbone and SATCOM, but operate with FBCB2, ASAS Lite, and AFATDS[2] to command and control squadron operations. This will enable squadron TOCs to operate with agile headquarters. When planning and control support is required, the squadron systems can reach other regimental assets through the regimental signals backbone.

In 1945, the General Board forwarded a proposal for the structure of cavalry regiments for the future Army. The recommendation was based on the assembled combat experience of the cavalry group commanders of the European Theater of Operations. Names like Reed of the 2d Cavalry, Polk of the 3d, Pickett of the 6th, are found throughout the body of the document.

The fundamental observation of the body was that the cavalry groups, as configured in World War II, were insufficient to face an uncertain future. The Board proposed regiments of three cavalry squadrons, with artillery, a strong communications element, and internal combat service support. Based on this wisdom of some 50+ years ago, I offer a new look at cavalry for the Interim Force.

The structure of the regiment that can execute these types of missions has its roots in a 1945 regimental structure
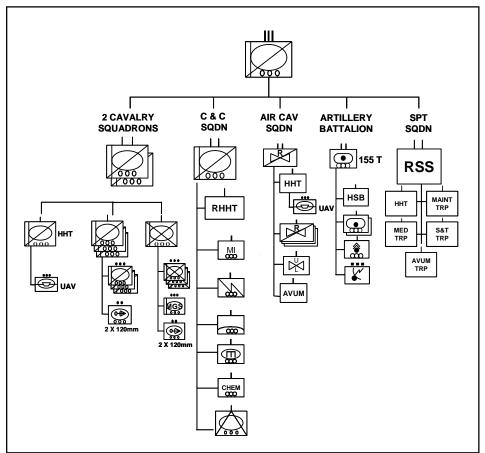

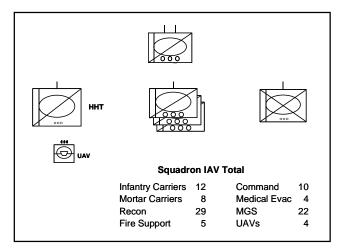**Fig. 1. Proposed ICR Organizational Concept**

Fig 2. Proposed Ground Cav Organization

Squadron IAV Total

Infantry Carriers	12	Command	10
Mortar Carriers	8	Medical Evac	4
Recon	29	MGS	22
Fire Support	5	UAVs	4

Fig 3. Proposed Air Cav Organization

Squadron Aircraft Total

AH-58D (Comanche) = 26
       (8 per Troop, 2 in HHT)
UH-60 = 14 (2 in AVUM Troop)
EH-60 = 2
UH-60 (C2) = 2
UAV = 4

proposal written by the commanders of the cavalry groups of World War II. Taking a page from history, and the operational experience of the 2d Cavalry Group, I propose a regiment of two ground cavalry squadrons, an air cavalry squadron, a command and control squadron, a field artillery battalion of rockets, radars, and guns, and a regimental support squadron. (See Fig. 1)

The regiment will have three maneuver squadrons; two ground cavalry and one air. The regiment will also have a command and control squadron that will provide the training command element for the various separate troops of the regiment, as well as acting as an extension of the regiment's overall C2 structure in extended operations. A field artillery battalion, with tube and rocket artillery supported by a target acquisition element, will provide direct and
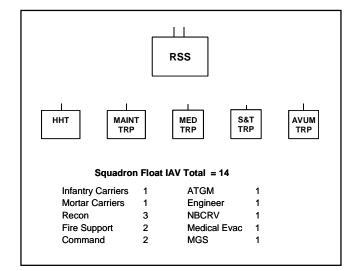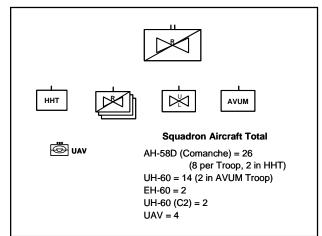
general support fires for the regiment. The regimental support squadron will provide the complete range of CSS to the dispersed squadrons of the regiment.

The ground cavalry squadrons will have three cavalry troops and one infantry or dragoon troop (Fig. 2). The cavalry troops will have mixed platoons of recon IAV and MGS. The recon IAVs must all be equipped with laser designators that can illuminate targets for artillery and air delivered (rotary and fixed wing) precision munitions. This ability will allow the regiment to extend the reach of the corps commander or JTF commander's punch and shape the battle. Dragoon troop, a combined arms team, gives the squadron commander a lethal, potent force that expands his tactical options depending on the mission at hand. The stronger on-the-ground strength of dragoon troop will allow the squadrons to patrol more intensively, clear small villages, or conduct dismounted combat patrols. The mortars within each troop will provide responsive immediate suppression fires for the squadron until the air cavalry and/or field artillery battalion can mass fires. The squadron also extends its own eyes with the addition of a UAV section in the headquarters troop.

The air cavalry squadron (Fig. 3) is a robust organization. The squadron

can operate with our traditional airground team pairing, or in advance of the regiment in offensive operations. The range of aircraft and UAVs in the squadron afford the regimental commander the ability to extend the eyes of the regiment, enhance his communications architecture with airborne relay, and move the dragoon troops in limited air assault operations.

We must also be motivated by the ever-present facts and finance of Patton's essay. The need for this regiment is NOW. We cannot afford one-for-one substitution of tanks and Bradleys for Recon IAVs and MGS. The cost of one-for-one substitution is prohibitive. The industrial base cannot produce sufficient quantities of these vehicles for a one-for-one substitution, which is a fact. Even given the potentially new budget reality in a post-11 September world, we cannot indulge in fiscal fantasy. The proposal outlined here can be made given the fact of the industrial plant of the IAV manufacturer and within the iron reality of the budget. We must also remember that other services will have needs, and there is not an infinite supply of cash.

The other fact we must deal with is the availability of strategic lift. Using a rough planning factor of three LAVs, three OH-58Ds, and two UH-60s per C-17, the sortie rate required to move this regiment is roughly 170 C-17 and 10 C-5. A ground squadron will require roughly 40 C-17 sorties. Depending on which component is the main effort at what stage of an operation, lift will be at a premium, indeed, it is ALWAYS at a premium. The proposed T/O of the regiment will fit into all forms of available strategic lift, and give the regional CINC a potent force.[3]

Squadron Float IAV Total = 14

Infantry Carriers	1	ATGM	1
Mortar Carriers	1	Engineer	1
Recon	3	NBCRV	1
Fire Support	2	Medical Evac	1
Command	2	MGS	1

Fig. 4 Proposed Support Squadron Organization

Infantry Carrier Vehicle (ICV)

- LAV III Chassis
- 8x8 Wheeled w/CTIS & Run Flat
- High Hard Steel Structure
- Remote Weapon Station with cal .50 MG or MK19 40mm

Mobile Gun System (MGS)

- LAV III Chassis
- Low Profile Turret
- M68A1 Cannon w/Autoloader
- Full Solution Fire Control

Regimental Configuration

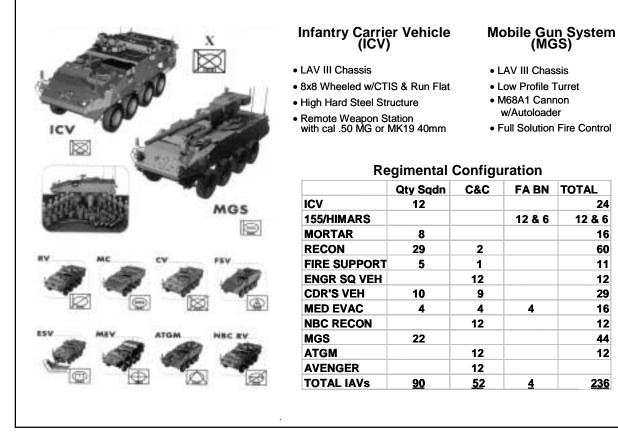|	Qty Sqdn	C&C	FA BN	TOTAL
ICV	12			24
155/HIMARS			12 & 6	12 & 6
MORTAR	8			16
RECON	29	2		60
FIRE SUPPORT	5	1		11
ENGR SQ VEH		12		12
CDR'S VEH	10	9		29
MED EVAC	4	4	4	16
NBC RECON		12		12
MGS	22			44
ATGM		12		12
AVENGER		12		
TOTAL IAVs	90	52	4	236

Fig. 5 Interim Armored Vehicle (IAV) Distribution

Except for the field artillery battalion's HIMARS and the Avenger antiaircraft system, the regiment's vehicles would share the common chassis of the LAV III, but with many variations. Chart shows distribution of these variants within the regiment.

This proposed macro table of organization for the regiment will allow our Army to field the 2d Cavalry rapidly and provide the Army a robust, lethal cavalry organization. The regiment will meet a near-term need and fit into the reality of a wartime Army. It will also serve by refining the tactics, techniques, and procedures our Army must develop for information-based combat and an air-ground mix of forces we believe will make up the Objective Force.

The President has called the Army, and the Nation, to war. In his speech to the nation he said he would, "direct every resource — every means of diplomacy, every tool of intelligence, ... every financial influence, and every weapon of war to the disruption and defeat of the global terror network." Our task is clear. We must field a regiment capable of entering the fray as soon as possible. The regiment must be able to capitalize on a trooper/sensor mix that will fulfill the role of cavalry to find, fix, and finish the enemy. The bugler is sounding "Boots & Saddles." It is time to ride!

Notes

[1]Reach operations are those that use the power of information devices to reduce the size of an in-theater staff. For example, intelligence reach allows an in-theater force to be supported from a secure support base not in theater or even from bases in the U.S. Service support reach will allow a reduction in the amount of classes of supply brought into theater, avoiding the "Iron Mountain" of supplies. This is NOT a disguised form of "just-in-time" logistics. It requires total integration of operations and logistics staff officers in planning and execution of operations. CASCOM is working on details of CSS reach.

[2]FBCB2 is Force 21 Battle Command Brigade and Below, a digital communications device; ASAS Lite is the work station associated with the All Source Analysis System, the superb intelligence device used by our G2s; AFATDS is Advanced Field Artillery Tactical Data System.

[3]I made these calculations based on my experience as a planner at XVIII Airborne Corps. I know that Military Traffic Management Command (MTMC) has an engineering section that can produce much tighter transportation estimates. I offer, though, that estimates are in the ballpark.

COL Kevin C.M. Benson is currently a U.S. Army War College Fellow at the MIT Security Studies Program. Prior to his MIT Fellowship, he served as the Chief of Staff, Army Transformation Project, at Fort Lewis, Wash. He has served in armor and cavalry units in the United States and Europe. Most recently, he commanded the 3rd Battalion, 8th U.S. Cavalry, an M1A2 tank battalion, at Fort Hood, Texas, from 1998 to 2000. He also served as the regimental executive officer, 2d U.S. Cavalry Regiment, at Fort Polk, La., from 1994 to 1996. COL Benson also served as the Chief of War Plans for both the XVIII Airborne Corps and Third U.S. Army.

Encountering Media On the Battlefield:

Will You Be Prepared?

by Captain Jeffrey P. Nors

The relationship between our country's armed forces and the media is unique. Like any constantly evolving relationship, it has its highs and lows. Gone — for now — are the days of a uniformed press corps attached to moving armies. The birth and rise of the 24-hour news cycle and international live broadcast has changed how the people of this nation will see every engagement in the future.

A strong military is a pillar of our democracy, as is the media. The media inform the very people who pay our salaries, own our equipment, and help form the opinions of the parents whose sons and daughters they entrust to us. For a significant portion of this nation, the media is their only link to the military. By recognizing and using this tool, we can tell the Army story, promote a positive image and continue to give our nation reasons to be proud of us.

A simple analogy is this: your unit is on a patrol when you make contact. The first thing you do is assess what you are up against. The second thing is to report your situation to higher headquarters. In a broader sense, we do the same thing. As soon as we find out what our situation is, we must report it to our higher headquarters. In this case, the American people are our higher headquarters, and the media is our radio.

By keeping in mind a few key points about the media, we, as leaders, can prepare our soldiers for when we encounter reporters on the battlefield. It is important we incorporate this, just as we incorporate the concept of civilians on the battlefield as part of our training.

Most reporters today have never served a day in uniform. Only a small percentage cover the military regularly. By gauging reporters' depth of knowledge about Army operations, we can help them to understand what we do. Patience comes in quite handy when explaining things that may be mundane to us; i.e., platoons are made of squads, which are made of fire teams, etc. But don't mistake their lack of knowledge for stupidity, as most reporters possess above-average intelligence. Respect for that aspect and patience will get you a long way.

Contrary to Hollywood stereotypes, it is not the pushy journalist who causes less-than-favorable stories. Think about it for a second; who are you more likely to say something embarrassing to, a reporter who is aggressive and needling at a certain point, or one who is conversational and non-threatening? The aggressive reporter will put you on your guard, and you will more likely say nothing, much less anything compromising.

Luckily, the majority of reporters want to file a 'good news' story. They have to put food on the table too, and wouldn't want to burn bridges for future stories. Because of this relationship, we can help them find the "good news" story.

"Interview 101"

The first rule when encountering media on the battlefield is that **your mission comes first.** In other words, you are in control. You are not required to grant an interview. You control when and how long the interview lasts. A great example of this principle comes from my experience as an observer-controller during the Mission Readiness Exercise (MRE) for the Stabilization Force Rotation in June 2001 at Fort Polk, La. As part of the exercise, a crowd of civilians was protesting American presence. When SFOR was called in to "control" the riot, there also was a group of reporters present covering the developing story. While attempting to talk to the SFOR commander on the scene, the commander politely but firmly reminded the reporters that he had a mission to accomplish. He told them once the situation was under control, he would be more than happy to grant a brief interview outside the town. With that said, he went about his mission. After the demonstration was under control, he met with several of the role-playing reporters outside the town and gave a terrific interview.

When entering a theater of operations, journalists register at a central office to receive their credentials. Their identity, news group affiliation and other information is confirmed to ensure that they are, indeed, members of an accredited media outlet. They are then issued some sort of identification badge or card which must be on them at all times. Even if they are escorted by public affairs, go ahead and check their credentials before granting an interview so you can report this information to your higher headquarters. Usually, reporters will be reluctant to hand over their credentials, so it's preferred to write down the information. It would be helpful to familiarize yourself with what current media credentials look like when you arrive in the theater of operations.

This leads to the next critical point of dealing with media on the battlefield. Most of the time, a public affairs representative will escort reporters. If you decide to grant an interview, use this resource to help you prepare. They will brief you beforehand as to what the reporters will probably ask, review command messages, (discussed later in this article), remind you about opera-

Murphy's Laws of Armor

(Editor's Note: The following mysteriously arrived in the ARMOR Magazine email-box without credit to an author...but he is obviously a very wise armor guy with a little time on his treads.)

1. Just after you report "Redcon 1" for your qualification run, you will realize that you desperately need to take a leak.

2. The fuel truck will run out of fuel just before he gets to your tank.

2a. You will run out of fuel before he returns.

3. Tanks don't float.

4. If a supply sergeant is given a choice between death and going to the field with his unit, he will ask for a few minutes to "Think it over."

5. Attempting to help recover a mired tank will only result in your tank becoming mired also.

6. The primary purpose of an operations order is to ensure that all blame falls on the line units.

6a. For this reason, the staff will not publish an operations order until after the exercise is completed.

7. Night vision devices will only fail at night.

7a. They will function perfectly once the sun rises.

8. The dirtier and more tired you are, the less appreciative you become of "constructive criticism" from somebody in a pristine uniform.

9. The heater on your tank will fail in October. The part to repair it will arrive in April.

10. No matter how minor the ailment, a visit to the medics will result in an I.V.

10a. Arguing with the medics about this will result in your being evacuated in a neck brace and back board (in addition to the I.V.).

11. When loading the main gun, remember: "pointy end first."

12. The only times you will throw a track are: a. At night, b. in the rain, c. during the movement back to garrison, or d. one hour after you installed the new ones.

13. Your vehicle will go NMC right after the contact team leaves the AO.

14. All infantry fighting vehicles ***don't*** look alike.

NEWS FLASH!

TANKS DON'T FLOAT.

15. Shaking trees to your front mean that you are being hunted by helicopters.

16. When you are told your engineer support was needed elsewhere, the bridge will be out.

17. The exercise will finish and you'll get back to garrison just *after* the wash rack closes.

18. If all else fails, shoot at the muzzle flashes — the larger ones are the dangerous ones, the smaller ones are infantry.

18a. The infantry muzzle flashes you ignore are covering an anti-tank team setting up.

19. "Rebel yells" are *not* proper FM radio procedure after a successful Table VIII shoot.

20. XO math: 3 pacs on the ground + no fueler + 2 deadlines = 100% FMC.

21. Close air support is safest from far away.

22. Proving that three feet of frontal armor protection will defend against any threat is probably best demonstrated on someone else's track.

23. Hearing an "Aw, shit" soon after an "on-the-waaay!" means you're probably not getting that promotion.

24. Tanks are very easy to see unless you're dismounted and they're backing up.

25. The one time you skip the firing circuit test is when you have the misfire.

26. "GUNNER, SABOT, SNIPER" is not an appropriate use of ammunition.

27. It is cruel to tell NBC types "Damn, that Fox looks like a BMP!" — particularly when live rounds are being issued.

28. Blackout drive + autobahn + 0345 = polizei.

29. Unsecured turrets will only swing freely mid-way through a rail tunnel.

30. When doing a gunnery, the tank is always operational until you get to the ready line.

31. If you are promised "downtime," what they really mean is: You will be breaking track.

32. First sergeant math: Buy Gatorade for $1.49 each and sell for $1.00 each — with the profits going to the unit fund.

Special thanks to SFC Mark Baker, whose "Private Murphy's Law" cartoon appears in *Army Times*.

SERGEANTS' TIME XXI

Training Today's Legacy and Interim Small Units in Transition
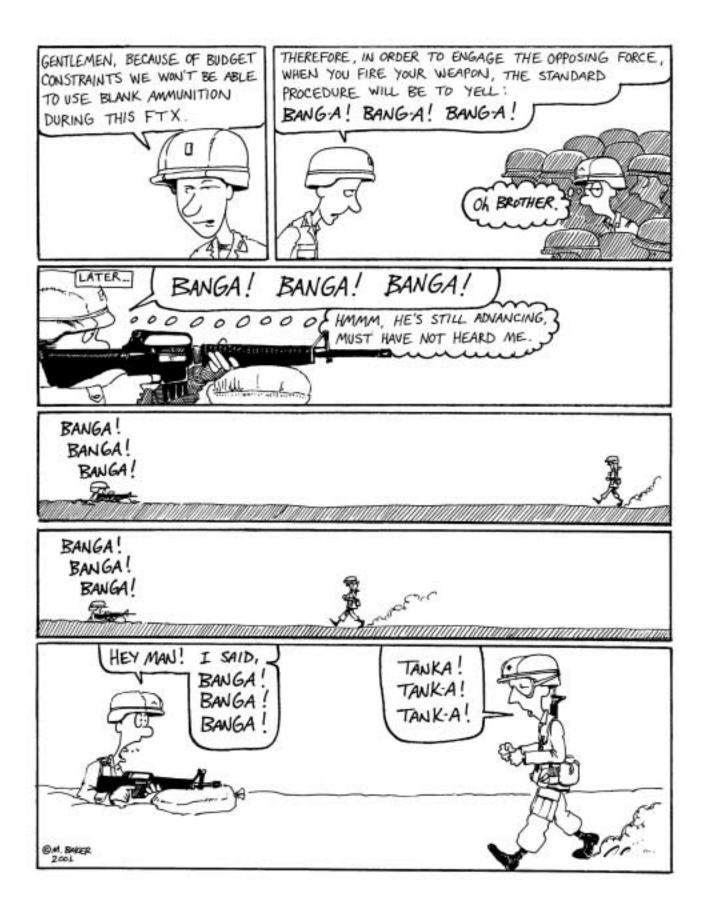
by Command Sergeant Major James L. DePriest

Before you begin reading this article, first consider the paragraph that begins on the bottom of page 3-5 of *FM 25-101, Battle Focused Training:*

"Some training time during the week should be devoted to the small-unit leader (such as a squad leader or vehicle commander) to train his unit. This enhances readiness and cohesion; it allows the junior NCO to learn and exercise the Army's training management system at the lowest level. The key is to train the trainer so that he can train his soldiers. This requires the NCO to identify essential soldier and small-unit and team tasks (drills) that support unit METL and then...

- To assess strengths and weaknesses.

- To formulate a plan to correct deficiencies and sustain strengths.

- To execute the training to standard."

There have been a number of articles published on Sergeants' Time in recent months. A significant number of Army units are continuing with business as usual, carrying out Sergeants' Time as they always have for the foreseeable future. But some units in transition — units that are changing equipment, mission, tactics, techniques, and procedures — cannot proceed as they always have if we are to produce competent, confident leaders for tomorrow's Army.

For these units especially, there must be a change of attitude in the noncommissioned officer corps, in the expectations of commanders, and in our educational systems. We must examine our training policy and develop new approaches to training individual and small unit collective tasks within our organizations, and to do this, commanders and noncommissioned officers must work together. *We can no longer tolerate the idea of officer and NCO business as separate entities. There can be only leader business.* If the Army's leadership fails to move forward in training management policy today, we will create a stagnation in the noncommissioned officer corps as the Army transforms.

Sergeants' Time could be very successful in the Cold War Army of the 1980s. Sergeants' Time became a templated event rigorously enforced by the sergeants major. There was complete chain of command support. We had one enemy, battle books on how to fight him, and every leader knew his actual wartime mission and where he was going to fight. Then, with the elimination of the Warsaw Pact as a primary threat, and a changing role for the Army, Sergeants' Time lost its focus.

A growing portion of the Army is beginning to experience life in the age of digital transformation, force restructure changes, and combat service support redesign. Imagine a heavy brigade being told to simultaneously conduct corps red cycle, division red cycle, field new command posts throughout the brigade, field Force XXI Battle Command Brigade and Below (FBCB2), train instructor key personnel (IKP), train FBCB2 operators, field the latest hardware of every other Army Battle Command System (ABCS), retrain every operator for those systems, and execute gunnery in three maneuver battalions — all simultaneously. Traditional Sergeants' Time cannot occur in this environment. Our information technology continues to grow. As soon as a system is fielded, it seems, it's almost obsolete. Feedback from operators and advances in technology create an unending spiral development process. And as the Army begins transition and training of the interim brigades, this scenario is bound to repeat itself.

My experience as a member of several boards has convinced me that junior noncommissioned officers have limited training management knowledge. Leader books are usually prepared for the board, but are absent of training data. Ask a soldier appearing to name a crew task and he will probably name an individual task, or have no answer at all. This is a failure of the unit and of the noncommissioned officer education system. We have failed "to train the trainer so that he can train his soldiers" (*FM 25-101*).

There is some discussion within the Army that *FM 25-101, Battle Focused Training,* is a Cold War document and is obsolete. But I believe our training policy and principles are sound. However, units can no longer simply be green, amber, or red. Simultaneous prime time training and support mission accomplishment is becoming the norm, rather than the exception. In regards to Sergeants' Time, there should be only minor changes in our doctrine. Opportunity training can become the time for first-line leaders to train their soldiers. But a templated event is increasingly difficult to support given today's fast-paced operational tempo (OPTEMPO).

How do we define Sergeants' Time XXI? **Sergeants' Time XXI is the execution of the commanders' training guidance at the lowest collective and individual level.** Every commander is required to know his unit's Mission Essential Task List and its assessment. It follows the same logic that first-line leaders know their small unit collective (crew/team/squad) tasks that support their platoon collective tasks, and their assessment. The first-line leader must also know the leader and soldier tasks that comprise the small unit collective tasks. He must know if his soldiers are a go or no-go in these tasks. How many leaders know the difference between collective and individual tasks or assessment and evaluation?

Sergeants' Time XXI cannot be only "NCO business" if it is to be "the execution of the commanders' training guidance at the lowest collective and individual level." This is not different from what is expressed in *FM 25-101*. We do not have time to allow first-line leaders to train on anything they want without specific guidance because the time available in today's Army simply does not allow it. As commanders execute training in accordance with their commanders' guidance, so must Sergeants' Time XXI be the execution of that guidance at the lowest level.

We seldom hold leaders accountable for Sergeants' Time today. Selecting one time in the week for Sergeants' Time is outdated and must change. First-line leaders must take advantage of every opportunity to train their soldiers. Leaders at every level must do

much better at time management. The senior leaders must develop new methods for time management of units. Green, amber, and red simply no longer apply. We all must help develop first-line leaders into better time managers.

First-line leaders today must be able to think collectively as well as individually in training management. They must understand what crew/team/squad tasks their unit must accomplish in support of the platoon collective tasks. They must have a means, a training and evaluation outline, in which to assess their small unit tasks. They must know the leader and soldier tasks that support the small unit tasks. They must know the evaluation of these tasks for all of their soldiers. First-line leaders must be able to convey to their platoon leadership what training their soldiers need. Platoon training meetings and well-documented leader books are invaluable to accomplishing this. Leader books must be a working tool.

I offer 11 small unit collective tasks and 11 soldier tasks that form the foundation of Sergeants' Time XXI for any organization — combat, combat support, or combat service support. The crew/team/squad tasks are:

Execute Pre-Combat Inspection - This is loading your equipment in preparation for movement by rail or for tactical operations. It includes vehicles and containers. It is also inspection of vehicles and equipment in a tactical environment prior to combat operations.

Maintain/Troubleshoot Equipment - This is the ability to perform preventive maintenance checks and services on all of your equipment and understanding the troubleshooting procedures outlined in the technical manuals.

Operate Equipment - This includes all assigned equipment.

Acquire and Engage Targets - This is with the M16A2, SAW, or from the gunner's station of a tank, whatever the soldier's primary weapon.

Occupy a Fighting Position - This is a crew-served fighting position or a vehicle fighting position, including range cards and sector sketches, analog and digital.

Conduct Casualty Evacuation - This is the ability to assess injuries, apply life-saving measures, and move the casualty to a safe location.

React to an NBC Hazard - This may include such things as chemical detection and unmasking procedures, as well as attaining an appropriate mission-oriented protective posture.

Conduct Hasty Decontamination - This is the decontamination of our vehicle and equipment by organic assets.

Establish a LP/OP.

Conduct Mobility, Counter-Mobility, and Survivability Actions - This includes actions such as setting up a hasty protective minefield, clearing a breach lane, or executing other expedient obstacles.

Execute Risk Management Procedures - This is the ability of the small unit leader to recognize danger and proceed with the mission with the least risk.

The individual soldier tasks are:

Report Enemy Information.

Send and Receive a Radio or Information Management System Message.

Engage Targets.

Operate Night Vision Devices.

Maintain Vehicle and Equipment.

Operate Vehicle and Equipment.

React to NBC Hazard.

Decontaminate Self and Equipment.

Evaluate a Casualty.

Prevent Heat and Cold Weather Injuries.

Call For Fire - voice and digitally.

Certainly, there are additions leaders could make to these lists. The list offers a foundation on which to build and allows for the basic combat functions of any organization.

The platoon sergeant is critical in ensuring the first-line leader is competent and confident to train his soldiers. There must be a training and evaluation outline for small unit and individual tasks. There must be an evaluation done at the completion of training. The platoon sergeant is invaluable in assessing the small unit tasks subordinate to the platoon tasks. The platoon sergeant is the evaluator for small unit collective tasks within his platoon. A problem exists here because many platoon sergeants have never understood training management doctrine and therefore, have never executed training as outlined in *FM 25-101*. We must train platoon sergeants, first sergeants, and command sergeants major to one Army standard. This preparation includes checking the training and evaluation outline, checking the leader to ensure he is competent to train the task, checking to ensure proper resources are on-hand, and checking that the leader book is annotated properly with an accurate

training status. Soldiers perceive well-prepared first-line leaders as competent and confident. This is critical.

In units undergoing transition, Sergeants' Time XXI can't be limited to only one templated day and time during the week. Training in these units simply does not allow for this. We must train first-line leaders to manage blocks of time that occur on an irregular basis. This is nothing more than what we have now as opportunity training or "hip pocket training." This will be difficult. It will require the dedication of the unit leadership to accomplish this. It will require platoon and company training meetings to be conducted to standard. This is not NCO business — it is leader business.

I offer a few suggestions for fixing the problems presented. We must begin with Training and Doctrine Command and NCOES. Identify what we expect noncommissioned officers to do and see how that relates to current programs of instruction. I think we will see that there is a difference in what we expect from noncommissioned officers doctrinally as training managers and what we teach them. A leader-teach for officers and noncommissioned officers on the definition, standard, and execution of Sergeants' Time must be accomplished to place the Army on one standard. We all have our own idea of what Sergeants' Time is. In defining Sergeants' Time, we must look at the Army in transformation and determine what is best for this particular environment. The senior leadership must achieve consensus on the definition and then be not only supportive, but ruthlessly enforce the standard. There is one other alternative: If we can't define or enforce the standard, then eliminate Sergeants' Time. I do not recommend this alternative. Sergeants' Time XXI gives us leaders who can navigate through the transition process. It gives us competent, confident first-line leaders that soldiers trust. It gives us leaders that can manage time effectively and train soldiers to standard on individual and collective tasks that support the METL. We must develop these leaders now.

CSM James L. DePriest is currently the command sergeant major for U.S. Army Operational Test Command, at Fort Hood, Texas. His previous assignment was 1st Brigade, 4th ID. He has over four years of experience in heavy maneuver, digital forces organized under force restructure, and CSS redesign.

Making Art Out of Digits

Employing the art of war

To maximize information technologies

And make units more effective

by Lieutenant Colonel John Hadjis

Popular press and professional journals have focused on the application of information technologies in the science of war to build a more effective combat force. Such arguments consistently favor greater centralized control of decision-making by better-informed senior commanders. This article argues that a focus on the art of war, and applying information technologies to enable better and faster decision-making at all levels, can create faster, more lethal units, and greater overall combat capability.

We invest time and money for information dominance in order to kill the enemy more quickly, more effectively, and with less risk to friendly forces. Digitized units can become more lethal when they leverage enhanced information and situational awareness (SA) with a solid foundation in three critical aspects: standard operating procedures (SOPs), platoons that flawlessly execute their battle drills, and personalizing your equipment to fit your needs (in the digitized commander's case, the Army Tactical Command and Control Systems, or ATCCS). Mastering these basics, coupled with information dominance, serves to build the confidence and intuitive abilities of leaders at all levels. Challenging training exercises that exploit the information dominance advantage produce bold leaders and soldiers who each influence the action in ways that bring synergistic effects and battlefield success. A unit composed of such soldiers and leaders would be a masterpiece in the art of war.

Digitized units that hone these areas can become more agile than any enemy they will face, and consequently more lethal. They will consistently act inside the enemy's decision cycle. Tactical agility denies the enemy opportunities to shape the battle with chemical attacks, scatterable and conventional mines, indirect fires, fixed and rotary wing aircraft, and developed security zones and combat outposts. Extraordinary agility by blue (BLUEFOR) units can render the red force combat ineffective before decisive direct fire engagement. Analysis of 33 offensive operations conducted by task forces training at the National Training Center (NTC) in fiscal years 99 and 00 supports this argument.[1]

ATCCS make our division and corps commanders tremendously capable. They can observe and act on information provided by real time unmanned aerial vehicle (UAV) feeds and JSTARS downlinks. In 4ID, this capability will soon be available to brigade commanders. ATCCS systems and weapons used to prosecute the deep fight (Longbow AH-64s, close air support, and long-range rocket systems) enable senior commanders to dictate the terms of the close fight to the enemy.[2] Our senior leaders set the conditions for close victory. Maneuver units, agile enough to get a sizable, combat effective force to the decisive terrain, are better able to exploit shaping efforts by brigade and division and less dependent on them. This desirable combination provides increased flexibility to senior commanders in allocating resources to deep, close, and rear fights.

The observations and tactics, techniques, and procedures (TTPs) advanced here are not mere academic or theoretical musings. These result from an extensive eight-month train-up of constructive and virtual simulation, culminating in a rotation to the NTC. What follows are TTPs to maximize information dominance, and tactical agility methods that have stood the rigorous test of engagement simulation against a freethinking opposing force (OPFOR).

Does It Work?

Success at the NTC is relative. Like most units, our battalion did not achieve the *MTP 71-2* published standard for missions at NTC. Fact is, the OPFOR at NTC is better skilled at their tactical drills than any BLUEFOR unit with less than 10 NTC rotations a year will ever be. OPFOR also benefits from the terrain component of situational awareness that no other unit can match, but information dominance applied toward building tactical agility helped even the odds.

We killed the OPFOR and forced him to react to us. Our digitized, redesigned armor battalion of three companies killed 1.06 OPFOR vehicles/aircraft/squads for every friendly loss, seized our assigned objective, and forced the OPFOR to commit his reserve in our offensive missions at NTC.[3] This is not quite double the kill ratio of 1 to .673 for battalions that had four maneuver companies. With 14 fewer tanks, and without the Division XXI enablers designed to level the playing field, we still proved more lethal than the average tank battalion because we applied fundamentals from the art of war to leverage our information dominance and act faster than the enemy.

SOPs

Maximizing the capability of your ATCCS and being faster than the enemy begins with effective SOPs that have been internalized by your people. Effective SOPs speed your ability to issue and react to orders, so that you can make and disseminate decisions faster than the enemy.

The best method I've seen to develop your SOPs is to conduct a full-up Military Decision-Making Process (MDMP) with your staff and commanders, and write an order for each of a task force's

The Force XXI Battalion Command Brigade and Below system offers a powerful tool to see the enemy and speed friendly reactions. The author suggests mounting the commander's system in an M113, rather than a tank.

bread and butter missions (deliberate attack, hasty attack, movement to contact, and defense in sector). Make those orders your SOP. The selected course of action (COA) from the orders should become a "play" for how you will fight each mission (with minor adjustments based on METT-T) every time you receive it.

Agility comes from changing as little as possible from your set play. Modify the play only as required to accomplish a specified or implied task from your higher that you don't routinely do. Our plays have set task organizations and movement formations (which we never change), and standard tasks and purposes for subordinate units and essential fire support tasks (which we often modify as part of the MDMP for the specific mission we have received). The purpose is to do it the same way every time, in other words by SOP.

The plays greatly speed your commanders' ability to get ready for the upcoming fight. They can anticipate their upcoming tasks because they understand their set task and purpose, and how they contribute to the task force play. This allows them to concentrate on rehearsals and pre-combat inspection, so they can react successfully to changes in conditions during execution.

Agility comes from the common understanding of the play, not from its perfect execution. Fragmentary orders (FRAGOs) during the fight are the "audible from scrimmage" that fits the play to the current METT-T situation.

Well-Drilled Platoons

Great SOPs and ATCCS won't make you quicker if your platoons can't execute.[4] Being faster than the enemy requires platoons that flawlessly execute their battle drills. Platoons don't maneuver. They react to contact with set drills. It makes no difference if the contact is visual, from the air, or from indirect or direct fire, they must violently execute a set drill without thinking in order to survive and win.

Well-drilled platoons make you more agile. "Drills provide virtually automatic responses to situations…".[5] Your guys will be faster than the enemy because they'll do things automatically while his guys have to stop, think, then act. Your decision cycle will be faster because while your platoons automatically execute a drill for the given situation, the enemy is scrambling to convey his intent and orders. You and your commanders stay two steps ahead of the enemy as you consider what to do next while he deals with the situation at hand.

Personalizing ATCCS

Force XXI Battalion Command Brigade and Below (FBCB2), for those who are not familiar with it, is a computer command and control system mounted in combat and support vehicles and command posts. It is the primary maneuver battalion ATCCS system and enables the user to see his and other instrumented friendly forces (depicted as icons) on a map in real time.

The system is a tremendous aid in making a task force commander men-

tally more agile. We say to "see the battlefield" you must "see" the enemy by understanding his doctrine and capability. You must "see" the terrain by knowing its effect on yours and the enemy's COAs. Finally you must "see" yourself through your subordinate unit status reporting. FBCB2 essentially gives you 100 percent accuracy for the third requirement. It is a powerful command and control aid that can make you exponentially quicker in your ability to get units moving where you want them and massed at the decisive point.

Look hard at where you are fighting from and decide if it's the best place to "see" the battlefield, maximize the potential of FBCB2, and help you think and act faster than the enemy. I turned tank commander responsibilities for my tank over to my battalion master gunner and operated from my M113. I found it a better platform from which to issue FRAGOs and fight the battalion.

You can wire your M113 so that your FSO and you have all the nets you need to command the battalion and control fires. FBCB2's position in an M113 makes it arguably the best digital platform you have. Its mount enables you and the FSO to stand in the cargo hatch with the screen right in front, so you can quickly glance down for a SA update while on the move.

If you are going to be fast, you can't allow the tremendous advantage FBCB2 gives you to abrogate your duty to per-

ANSWERING THE 9-11 CALL

A New York National Guard Unit Rushes into Manhattan's Chaos

by Major Eric Durr

CPT Dave Willis, S1 of the New York Army National Guard's 1st Battalion, 101st Cavalry (Tank), was no stranger to the small park outside 1 Liberty Plaza near Manhattan's southern tip. Nestled near the base of the 110-floor Twin Towers of the World Trade Center it was a place to sit, catch some sun, and watch pretty girls go by.

But at 1700 on September 11, 2001, the scene was quite different as Willis and 25 members of the 1-101st Cav rushed into Manhattan from the unit's Staten Island armory. This once familiar site now looked like a scene from hell.

Everything was covered with thick dust, the pulverized residue of concrete, gypsum, asbestos, charred wire, and human remains. Dense, acrid smoke filled the air, stung the eyes, choked the lungs, and blocked out the sun. Hundreds of firefighters, looking desperately for survivors, swarmed over what remained of two of the tallest buildings in the world. "It was hard to make out exactly how much damage there was through all the smoke," Willis remembered. "We could only see one corner of World Trade Four. It was smashed flat. Tower Two had landed on it.

"The feeling on the ground was more or less total chaos. It took me 15 minutes to find somebody who could even claim to be in charge," he recalled.

With two ambulances, a truck full of medical supplies and 25 medics and tankers, the detail was the 1-101st Cav's first response to the most devastating attack ever launched on the United States. Equipped with basic M1 tanks, the "Wingfoot" battalion's primary focus had always been tank gunnery and maneuver training. OOTW and urban civil assistance operations had not been a training priority, although the battalion had been called to state active duty for almost two weeks during a devastating ice storm in January 1998. Using the battalion's Staten

Island armory as home base, over 400 members of the battalion spent two weeks aiding the New York City Police and Fire Departments. It was one of several New York National Guard units called into action for the emergency.

The unit's soldiers provided aid to displaced civilians, secured the disaster site itself, shut down unnecessary traffic in southern Manhattan, transported needed supplies, and provided a military presence that reassured city residents.

The unit is configured as a standard armor battalion. HHC and A Company are headquartered on Staten Island, a short ferry ride across New York Harbor from the World Trade Center (WTC) site, while other subunits are based farther north in Upstate New York. B Company is based in Troy, 170 miles away; C Company in Hoosick Falls, 200 miles away, and D Company has its headquarters in Newburgh, 81 miles up the Hudson River from Staten Island.

1-101st Cav soldiers began reacting to the WTC attack even before it was clear what had happened. As broadcasts reported that a plane had hit one of the Twin Towers, battalion members began calling to let the full-timers know where they could be reached. Soon they were heading for their armories, antici-

pating New York State Governor George E. Pataki's general mobilization of the New York National Guard.

HHC and A Company, closest to the disaster, mobilized to provide relief immediately. A local Home Depot store offered to donate supplies and the battalion dispatched a HEMTT to pick up picks, shovels, lights, generators, and other useful items. The battalion also responded to an urgent request from medical officials and gathered 100 body bags for delivery to an aid station hurriedly set up at a Staten Island baseball stadium.

The situation on Manhattan was unclear. The collapse of the Twin Towers wiped out both the key leadership of the New York Fire Department and the city's emergency management team. The New York City telephone system had broken down because key phone relays and cell phone transmitters were destroyed in the attack. At the same time, the crippled system was overloaded with calls.

Unable to contact state headquarters in the Albany area, LTC Mario Costagliola, battalion commander, and the commanders of the other two Army National Guard combat units in New

York City — the 1st Battalion, 69th Infantry, and the 1st Battalion, 258th Field Artillery — approached the police and put together an *ad hoc* plan to secure southern Manhattan. The three commanders agreed the 1-69th Inf and 1-101st Cav would establish a security perimeter south of Canal Street, and be relieved by 1-258th FA that night.

While their New York City brothers in arms were responding to urgent calls for help, the soldiers of B, C, and D Companies rallied at their armories and began loading trucks for the move south. Communications with Staten Island were virtually nil, so the XO assumed control of the upstate units and directed C Company, the most remote unit, to move its soldiers and equipment to Troy as quickly as possible. The goal was to muster B and C Companies together and road march south to Staten Island.

Contact was finally made with LTC Costagliola, who directed D Company

to move to Staten Island on the New York State Thruway no later than 2000 and instructed the XO and CSM to move B and C as quickly as possible.

With only about 200 soldiers at the Staten Island Armory, the 1-101 Cav needed its upstate manpower to complete the mission.

But the B Company and C Company move was delayed. State headquarters refused to issue road clearance for a convoy, or to provide a bus for soldiers who couldn't be carried in military vehicles. The response to the XO's entreaties to move the two companies was that there was no mission request yet.

Complicating the movement request was the fact that the New York National Guard's standing disaster relief C2 arrangements put A, D, and HHC, 1-101st Cav subordinate to NYARNG's 53rd Troop Command, while B Company and C Company fell under the geographic region controlled by HQ,

42nd Infantry Division. Direct intervention by the 53rd Troop Command commander finally eliminated the logjam at state headquarters, but by then it was too late to move B Company and C Company that night.

On the morning of September 12, the soldiers of A and D Companies and HHC deployed to Manhattan with the armored HMMWVs of the combined scout/mortar platoon, dubbed Saber Element, leading the way. As he came within sight of the devastated buildings, LTC Costagliola could think only of nuclear winter. Lower Manhattan looked like an atomic bomb had gone off, he recalled. The streets were littered with abandoned cars, many with roofs crushed by chunks of concrete. Scraps of paper littered the ground, and thick gray dust covered everything. Above it all hovered the heavy pall of smoke from the World Trade Center.

Uncertain about what missions they faced, the battalion brought empty

Photos: SGT William O'Neil, CPT Eric Schultze, and 1LT Frank Banaszewski

Working from their command post in a nearby park, seen at right, soldiers of the 1-101 Cav helped stabilize the situation near the World Trade Center site. They checked IDs, patrolled streets to keep out gawkers, and escorted residents of the blocked-off "frozen zone" at Manhattan's southern tip. Their trucks performed many essential logistic tasks and fuelers resupplied New York fire trucks. Many of the unit's Guardsmen were also members of the New York police and fire departments.

trucks, a HEMTT loaded with emergency supplies, wreckers, fuelers, and weapons and riot control equipment stored on locked, built-up five-tons. The fresh soldiers linked up with a 30-member element that 1LT Tracey Young, commander of A Company, had brought to Manhattan on the night of September 11 to relieve CPT Willis' contingent.

The 1-69th Infantry and 1-101st Cav established a line of troops that effectively closed Manhattan Island south of Canal Street and placed assembly areas in Battery Park, at Manhattan's southern tip. Battery Park is usually where tourists line up to buy tickets for trips to the Statute of Liberty. The Park included historic Castle Clinton, built as a harbor fortification in 1808. During the Civil War, New York troops mustered there. Once again it was a military assembly area.

While A, D, and HHC took their positions, B and C Companies were road marching south to link up with the rest of the battalion in Manhattan. The upstate New York soldiers were routed around traffic by the New Jersey State

Police and their 20-vehicle convoy was rolling along a deserted highway leading to the Holland Tunnel and Manhattan by 1000. As they approached, they caught glimpses of the gaping hole in the New York City skyline, replaced by a huge, rising cloud of smoke, which was evident for miles away.

The battalion's main mission was to help the New York City Police Department keep gawkers and other nonessential personnel out of Lower Manhattan. With more manpower, 1-69th Infantry took the larger perimeter stretching along the west side of Manhattan up to Chambers Street. Broadway was the operational boundary between the two battalions.

Each company was assigned a piece of the screen line. Three to five soldiers, backed up by NYPD members, checked identifications and determined who could enter the so-called "frozen zone."

Among them were the residents who lived in that area. Companies provided soldiers to escort southern Manhattan's apartment dwellers, hurriedly evacuated on September 11, into and out of

their homes as they searched for pets, prescriptions, and valuables. The soldiers often provided a comforting shoulder when residents broke down, confronted by the devastation around them.

1-101 Cav also assumed initial responsibility for securing and providing staffing for one of the emergency morgues set up in 1 Liberty Plaza, a massive office building which many rescue workers feared would fall. The battalion's support platoon and maintenance platoon provided details to keep nonessential personnel and the curious from interfering with the battalion medics working inside.

Work on the site was punctuated by periodic warnings that buildings were about to collapse. Everybody quickly learned that three blasts on an air horn meant "Run like hell... something's coming down." There were several false alarms, and by Day Three of the operation, it was SOP that rally points be established for soldiers working near the WTC site and that by-name lists of soldiers on details had to be provided to the TOC for accountability purposes.

Battalion soldiers also conducted a variety of logistics missions. Battalion trucks carried bottled water and jackhammers from a ferry landing on the Hudson River to the WTC site and provided a water buffalo for FBI agents screening WTC refuse at the Staten Island landfill. The fire department on Staten Island was provided with an M-1064 mortar track to use in blocking an entrance into a critical area, and HEMTT fuelers were stationed on Manhattan to fuel Fire Department vehicles. Battalion HMMWVs were also used to collect and distribute food prepared by restaurants to feed rescue workers.

Many of the cav unit's soldiers were frustrated because they wanted to go to the WTC site and help dig out survivors. It galled them to read accounts of volunteers from Maine or Ohio who were allowed to work at the site. Many 1-101 Cav soldiers felt a special urgency to help in the rescue effort because the New York City-based members had friends buried in the rubble. Almost a quarter of the battalion's soldiers are police officers and firefighters. They felt the loss of colleagues killed when the buildings collapsed.

But the situation at Ground Zero demanded special expertise in recovery that the battalion's soldiers didn't have. The Fire Department insisted that the Guardsmen could do more good in a security mission. That was borne out on the night of September 13 when the battalion was asked to come in and perform a crowd control mission at the site.

A massive crane was being erected and the hosts of firemen and police officers on hand to watch and help were getting in the way. At the request of the fire department, the battalion's A and D Companies came in to clear the way and then established an inner perimeter to keep nonessential, but well-meaning, personnel away. As a "third party," the Guard had authority that neither the cops nor firefighters would have had with each other. The Guard presence also put an end to a lot of well meaning but unnecessary rescue workers freelancing at the site.

With so many unit members in the NYPD or the FDNY, about 100 opted to serve with those city organizations when the 1-101st mobilized. Fortunately, many key leaders and soldiers in critical positions, like HHC commander

CPT James Hom, and A Company commander 1LT Tracey Young, members of the NYPD, opted to mobilize with the unit.

He mobilized with the 1-101st, 1LT Dennis O'Brien (also a lieutenant in the NYPD) explained, because he felt he could do more good as a Guardsman than as a police officer.

O'Brien said that as a police lieutenant, he would show up at a station house and be handed a list of paper with the names of three sergeants and 12 officers he'd never worked with before and told to head out to Manhattan. By serving with the 1-101st Cav, he was working with people he knew and who knew him, and with a defined chain of command, he said.

The battalion operation quickly assumed the familiar framework of tactical echelons.

The Manor Road Armory on Staten Island served as the field trains and life support center. A maintenance slice worked here to keep vehicles running and handle logistics reports and paperwork, while the battalion's mess section served meals before shifts and ran lunchtime LOGPAC to troops working in Manhattan. The battalion S4 immediately opened a contract with a local caterer and arranged for laundry services. The S4 section also coordinated the distribution of bottled water, extra food, and clothing and toiletry items donated to the rescue effort by local businesses.

A small slice of HHC soldiers, supplemented by members of the New York Guard, a voluntary state militia organization, provided armory security and ran some logistics support missions from the armory.

The soldiers from B, C, and D Companies were housed in the armory mess hall and classroom while HHC and A Company soldiers crammed themselves into offices. Soldiers who lived on Staten Island were allowed to go home to make space in the building.

Transportation was arranged through the Metropolitan Transit Authority, which provided buses to move the soldiers to and from Manhattan. An emergency-vehicle lane on the Brooklyn Expressway and Staten Island Expressway provide access to Manhattan through the Battery Tunnel.

The battalion also made extensive use of the Staten Island Ferry, which was

closed to non-emergency traffic during the first week of the deployment. Each morning the convoy would roll down to the ferry landing and roll onto a waiting boat, which would transport the vehicles and soldiers across New York harbor. LTC Costagliola, referencing the Battle of Stalingrad, began to joke about heading "back across the Volga."

The battalion TOC, housed in a five-ton command van the battalion acquired in lieu of a five-ton truck, was initially co-located with the NYPD emergency operations center at a Pathmark supermarket. The TOC was shared with 1-258th and the initial higher headquarters for Operation NYC, the 107th Support Group, placed a liaison officer there. The TOC was able to coordinate directly with the NYPD, 258th, and 107th to coordinate battalion missions.

Finally, the battalion's TAC was based in the Battery Park area. At this location, the battalion commander could monitor events and reach critical points rapidly. For three days following a rainstorm on September 13, the TAC was established in the Staten Island Ferry terminal, which was closed to non-emergency foot traffic, and the battalion's vehicles parked outside.

A critical concern for the battalion's leadership was obtaining masks so soldiers could filter out the dust and potential carcinogens that filled the air near the WTC site.

Initially, all the battalion had available were dust masks from a Home Depot and filter masks obtained by the C Company commander, CPT Michael Pickering, from his workplace. As time went on, more efficient masks were made available to all rescue workers and the battalion's soldiers acquired them. Battalion uniform SOP required a protective mask on a soldier's Load Bearing Equipment (LBE). Soldiers working near the WTC site were required to wear their masks.

Even so, a number of unit members reported respiratory problems at the conclusion of the two-week tour. As this article is written, an effort is underway to ensure that Line of Duty (LOD) investigations are conducted for each individual.

Communication was another critical issue for the battalion.

The initial attack wiped out landline phones and disrupted cell phone sys-

tems. On the evening of September 11, the battalion employed the Internet and personal AOL accounts to communicate between Staten Island and Troy, New York. The Internet was first developed as a way to route messages indirectly in a nuclear attack and it worked for the 1-101st Cav. E-mailed Sitreps sent by LTC Costagliola from Staten Island to Troy were passed onto the state and 42nd ID Emergency Operation Centers, providing them with timely information on the disaster.

By September 12, cell phone communications began to come back up, although they were not completely reliable. The battalion's leadership relied on personnel cell phones to keep in touch with the rear operation on Staten Island and with each other when FM communications didn't work because of the New York City skyscrapers. The general consensus was that everybody's cell phone bill was going to be immense. A letter was prepared from the battalion commander to send to cell phone providers asking that the charges be waived because of the nature of the emergency.

FM communications were normally reliable. But as an armor unit, the battalion didn't have all the PRC-77 backpack sets that could have been used. The battalion's HMMWVs were pressed into use as command and control vehicles to link together remote security points. With no set SOI the battalion's communications section simply picked frequencies that would not conflict with police and fire radio nets. The battalion employed fixed call signs and operated on 30.00 for the duration of the deployment.

The battalion also pressed its collection of PRC-127 Motorola "brick" radios into service. Obtained mainly to facilitate range operations during tank gunnery, the small radios proved invaluable in linking key personnel together.

The communications system improved immeasurably when State Headquarters provided Nextel cell phones to key leaders in all the committed battalions and headquarters. The system could be employed as a standard cell phone or as a two-way radio and went a long way towards linking together all National Guard elements on the ground in Manhattan.

There was initially some confusion over the battalion's weapons status.

With communication with state headquarters cut off, the battalion commander reacted to the news that the U.S. military was at a high threatcon level by deciding to send the soldiers in under arms.

When the battalion initially deployed, some of the scout HMMWVs had M-2HB and M-60 machine guns mounted and some battalion soldiers were armed. Directives from state headquarters and the governor's office soon made it clear that this was unacceptable. Nevertheless the images of armed HMMWVs were broadcast on CNN for several days.

Since the battalion was in an Aid to Civil Authorities status, the determination by the New York Adjutant General was that no weapons would be carried. JAG lawyers made it clear that even the battalion's police officer members, who are required to carry weapons when off duty, could not carry their police or personal weapons while in a uniformed status. With reports of possible follow-up terrorist attacks coming regularly during the first week of deployment, the no-weapons rule caused some consternation for battalion soldiers. Lower-ranking police officers also repeatedly expressed surprise that the National Guard soldiers were not armed. "Aren't you guys here to protect us?" one officer asked a battalion soldier at a check point.

Liaison with the police department was critical. MAJ Robert Maganini, an Intelligence officer from New Jersey normally working in the 42nd Infantry Division's G-2 section, played a critical role in moving between the police and the deployed battalions during the first few days. He kept police officials informed of Guard capabilities and helped explain police intent to the deployed battalions. Initially, he and a few other officers worked alone, but as the deployment progressed, this *ad hoc* arrangement was formalized, with National Guard liaison officers working in every police zone.

During the first week of operations, the battalion was uncertain about potential missions and deployed each day with a variety of vehicles and equipment. Equipment on hand included weapons, riot control gear and flak vests, along with a variety of picks and shovels. By the second week of Operation NYC, the mission had become one of presence and helping to secure the WTC

site, and the battalion began leaving fueling and hauling assets and unneeded HMMWVs at Manor Road.

The battalion benefited from the relationship of many of its soldiers to NYC government. One member of the support platoon was a bus scheduler with the Metropolitan Transit Authority and was invaluable in obtaining and coordinating bus support for the battalion. Other soldiers had connections with the NYPD and FDNY, which came in handy in obtaining supplies.

In the absence of direction from higher headquarters, the three battalion commanders in lower Manhattan pretty much did their own thing, coordinating with each other to ensure all missions were covered. This *ad hoc* arrangement was approved by the 53rd Troop Command commander.

Stress was an issue for the battalion during the deployment. Many of the New York City-area soldiers were dealing with the knowledge that friends and acquaintances were dead in the wreckage of the World Trade Center. Some had narrowly escaped death in the catastrophe themselves. Many of the other soldiers had concerns about being yanked away from home, family, and work at short notice. State headquarters made available a crisis counseling team comprised of a psychiatrist, psychologist and Army social worker, who made themselves readily available to the battalion's soldiers.

The crisis team debriefed all the soldiers prior to rotation home to help deal with the trauma of the things they saw and did for two weeks. In one instance, a soldier was hospitalized overnight for a psychiatric disorder, which the crisis team identified.

As in most National Guard deployments, the issue of civilian job and school conflicts began to become a serious mission distracter for many soldiers. New York National Guard JAG officers were made available by the end of the first week to deal with any employer threat to dismiss a soldier of state Active Duty. As the mission became more routine during the second week, college students were released to return to school.

A key issue for many 1-101st Cav members who were police officers was the status of their military leave time. Most government agencies provide 30 days of military leave for civil servants.

Making Art Out of Digits

sonally lead your outfit instead of managing its icons. To best leverage your advantage, form a command group consisting of your tank, the S3 in his tank, and you in your M113 with the FSO. Offset your command group behind the lead platoon of the task force's lead/main effort company. Your goal is to see the task force's first contact with your own eyes.

Personalizing FBCB2 to fit your needs and becoming comfortable with it means developing and executing training so that operating the system is as normal as operating the FM radio. Force your people to become comfortable with their ATCCS. My approach is purposely draconian. I have banned paper maps with overlays, and we only produce and disseminate digital graphics. This includes units working with us that do not have FBCB2. We use brigade Terrain Index Reference System (TIRS), published in the brigade TACSOP, to convey the scheme of maneuver to persons fighting from non-digitized platforms. Banning "analog" graphics forces us to use FBCB2 and provide a work-around for those who don't have the system.

Set up FBCB2 so it helps you, and your subordinate commanders and staff think and act faster. The system allows you to set the screen display to various settings that give either an exploded or detailed view, and allows you to see individual platform icons, or collapse them into a higher unit. Collapsing four individual tank icons into a platoon displays them as a platoon icon located at the center of mass of the four individual vehicles.

I set my screen to 1X power and leave all friendly icons open. Seeing every icon lets me see the actual disposition of my units and those on the flanks and helps me visualize the time distance factors required to act on orders I issue. My XO sets the display on the command post's Maneuver Control System to the same settings, so that the battle staff can see the implications of decisions we make on both our units and those on the flanks. My company commanders generally work with their screens in 2X power, with units on the battalion's flanks collapsed into platoon icons. 2X gives them a detailed view of their company and the map, which aids in both command and control and in navigation.

Final Thoughts

Nobody knows with absolute surety what the environment of the next conflict will be like. What we do know is that the pace of operations will be high, the weapons available to the enemy lethal, and that we'll have very little, if any, time to overcome training deficiencies. Leveraging information technologies by small unit leaders who have demonstrated a mastery of the art of our profession can create agile units that will dominate the enemy.

Notes

[1] Armor Task Force/Cavalry Squadron and OPFOR Casualty Data from Rotation Take Home Packages Fiscal Years 1999 and 2000 (National Training Center, Fort Irwin, Calif., FY 99 and FY 00).

[2] MG Benjamin S. Griffin and LTC Archie Davis, "Operation-Centric Warfare: Setting the Conditions for Success at Brigade and Battalion," *Army*, Vol. 50, No. 8, August 2000, p. 24.

[3] 3-66 Armor, *Rotation 00-10 Take Home Package*, (National Training Center, Fort Irwin, Calif., 19 August – 2 September 2000).

[4] United States Army Training and Doctrine Command, *TRADOC Pamphlet 525-100-2 Leadership and Command on the Battlefield Battalion and Company*, (Fort Monroe, Va., 1993), p. 55.

[5] Department of the Army, *FM 17-15 Tank Platoon*, (Washington, D.C., 3 April 1996), p. 3-31.

LTC John Hadjis has served in a variety of armor assignments in Korea, CONUS, and Germany, and as an OC at the NTC. He currently commands 3-66 AR, 1 Bde, 4ID (M) at Fort Hood, Texas. The author acknowledges all those, both at Fort Hood and the NTC, who commented on earlier drafts of this article. He especially thanks COL Jim Warner (OCJCS) for his advice, mentorship, editing, and critical comment.

Since the battalion had already performed AT in July and August many police officers began using up their leave time and some had to leave the battalion and return to their jobs or face loss of pay or health insurance.

Concern about jobs and rights to jobs resulted in a limited response when the state later asked for volunteers to continue the mission once the battalion deployment ended. Many job protections under state and federal law vanish if a soldier volunteers to go on state Active Duty.

On top of its other missions, the 1-101st Cav also carried out information operations in support of the New York National Guard PAO. A team of *New York Times* reporters and photographers lived with the battalion for a week, writing stories about the Guard mission in NYC. LTC Costagliola was featured on an Italian television newscast, and the battalion played host to reporting teams from the *Albany Times Union* and *Staten Island Advance*.

For two weeks, the 1-101st Cav soldiers performed every mission given them. There were no complaints despite long hours, stressful circumstances, and cramped living conditions.

To a man, the battalion's soldiers were glad they could be doing something to help their fellow citizens and living up the to battalion's motto: "To the Utmost."

MAJ Eric Durr was commissioned in Armor from Kent State University in 1980 and has served as a platoon leader in 2-64 Armor in Germany and assistant S3 of the 479th Engineer Battalion, Watertown, N.Y. He has also served as S2, tank company commander, and headquarters company commander in 1-210 Armor, based in Albany, N.Y. A graduate of the reserve Armor Officer Advanced Course and CGSC, he is the executive officer of 1-101 Cav, based in Staten Island, N.Y.

Designating Targets with "God Guns"

Using laser designators and adapting the gunner's sight to "see" them
Could improve communication between tanks and infantry

by Captain Michael S. McCullough

With the advent of the M1 tank in the early 1980s, a small but useful form of communication was lost — the external, vehicular-mounted telephone. With a handset usually mounted on the rear of the tank, this telephone provided infantry of the WWII and Korean War era with a method to communicate with armor crewmen inside, even when in contact. The infantry used them to coordinate fires, movement, and protection.

Since the telephone was eliminated on the M1, this kind of infantry-armor cooperation has become completely reliant on the radio to communicate effectively. Once the radio nets are lost, only the most basic signals remain.

There is, however, a low-cost interim solution that our forces could use instead: the Gunner's Auxiliary Sight (GAS) could be equipped with an infrared optic that could enable the gunner to see targets that are laser-designated by the infantry. By incorporating a monocular, infrared (IR) night vision device to the tank gunner's auxiliary sight, the GAS becomes night capable.

In late 1994, as a platoon leader, I experimented with using our MILES "God guns" for purposes other than rekeying. I gave them to the dismounted squad leaders to designate targets in windows and alleys, or to mark movement. The problem with this technique was that tank commanders had to stand up in the hatch and use their night vision goggles to see the laser-designated targets. With the TC exposed to possible sniper fire, we were limited to a support-by-fire position 300 or more meters away. And once we began taking mortar fire, we had to button up, making the technique unusable. In addition to being useful in MOUT situations, we used the technique in setting and initiating ambushes and command

and control in the defense. Though I had little experience working with the infantry at this point, the concept was feasible and we were able to engage and destroy several targets. With an internal IR optic, combined with the new series of laser designators, our mission would have been even more successful.

We need to explore some considerations for incorporating IR optics in the GAS. The IR optic should be attachable, or capable of being rotated in or out of the GAS so that the sight will not be useless if the night vision optics fail. This would allow the gunner to have both thermal and light-sensitive optics.

The infantry currently have systems that would work in conjunction with the IR optic. Two examples are Laser/Device Zeroing, and the AN/PEQ-2A. Infantry leaders have been using these devices for target designation for years. With practice and disciplined techniques, a unit can designate and also identify themselves on the battlefield. One technique is to flash different types of lines to indicate the designating unit. For example, a vertical line might indicate the 1st Squad, a horizontal line the 2nd Squad, circles the 3rd Squad, etc. It is obvious that with the development of an infrared (IR), night sight, infantryman could designate targets to tanks.

Some possible applications of a tank IR sight and the laser designators include: communication with observation posts, squads designating OPFOR positions in windows of buildings, designation of targets in an ambush, identifying hostile streets, marking no-fire zones, trigger lines, medevac marking, identification of landing zones, tracing movement in trench lines, and initiating fires without the need for a noise maker (which would probably not be heard inside the tank anyway).

There is a growing need for communication and target identification techniques between tanks and dismounted infantry. In recent history, missions such as Panama, Haiti, Somalia, Bosnia, and Kosovo have placed a larger emphasis on a more flexible task organization, such as armor and mechanized teams. With the growing number of low-intensity missions, the need has increased for new techniques of communication between these forces. Our vehicle antennas have become extremely vulnerable to the weapon systems that threat forces utilize, like light AT weapons, grenades, and mortars. Though these weapons may cause only minor damage to our armored vehicles, they can quickly reduce our commo capability and keep us buttoned up.

Unfortunately, mounted and dismounted soldiers have become almost completely reliant on the radio. In the close fight, when radios go out, tank commanders and squad leaders have to fall back on hand and arm signals, flares, or flags. However, few have ever practiced with flags and most are rusty on the full spectrum of hand and arm signals. If a situation required immediate communication between ground and armored crewman, under limited visibility, it would be extremely dangerous for a dismounted infantryman to jump up on a tank without a signal. Furthermore, when the hatches are closed, the field of view is very limited, thus making the area around the tank even more dangerous to anyone on the ground.

With any new system, there are limitations and restrictions that need to be considered. Laser designator saturation can cause a literal IR, laser light show, causing confusion. Additionally, understanding the enemy's night

Troop Leading Procedures at Company Level:

…Delegation is the key to success

by Captain Mike Henderson

How often has a company commander felt that time constantly had the better of him while conducting troop-leading procedures? After personally struggling with this as a tank company commander and after observing six other company commanders at the CMTC utilize six different techniques for managing time, I found some techniques that work well. The most effective involved delegating responsibilities to other key leaders in the unit. Here are some techniques for creating a "staff" from available assets.

Executive Officer - The XO writes paragraphs 4 and 5 and portrays the enemy during company rehearsals. In addition, he supervises the terrain model construction or, if the company conducts a mounted rehearsal, the XO commands the "enemy forces." His responsibilities for portraying the enemy are the same as in a wargame: action, reaction, and counter-action. He portrays where the enemy can influence the company and with what weapons systems. He should also have the ability to portray the enemy action that may cause a branch to the company base plan, meanwhile keeping track of both enemy and friendly losses.

The terrain board is constructed to ensure that the commander's intent is met, and reflects the attendees and amount of daylight for the rehearsal. The terrain board, at a minimum, must include phase lines, checkpoints, battle positions, artillery targets, direct fire control measures, attack-by-fire positions, templated enemy locations, and key/decisive terrain.

If possible, a separate, more detailed terrain model of the objective area can be used for coordinating friendly actions on the objective to mitigate the chances of fratricide. Additionally, the terrain board is ideal for the company CSS rehearsal, led jointly by the XO and the company first sergeant. In performing these duties, the XO better understands how the scheme of maneuver will unfold and also provides the commander with the ability to see his unit from the enemy point of view, and recognize shortcomings in maneuver execution and logistical sustainability.

Fire Support Officer – Among the FSO's primary responsibilities are advising the company commander of the capabilities and limitations of his fire support assets and helping the commander refine the task force fire support plan to a company's perspective. In addition, he can also be a very effective assistant S2 if trained properly (the commander still being the primary intelligence officer in the company).

In refining the fire plan, the FSO analyzes terrain, weather, enemy composition, disposition, and capabilities. In analyzing these factors, the FSO determines the effects of weather on the use of smoke, and on his night sight for the Ground/Vehicular Laser Locator Designator (G/VLLD) and he must consider light data for marking his limited visibility triggers. He also takes into consideration the types of ammunition needed for each target, such as whether to use variable time or time delay fuses.

In addition to FA considerations, the FSO makes a preliminary analysis of how the enemy will influence the friendly scheme of maneuver. He and the company XO, who portrays the enemy in the combined arms rehearsal, can conduct a joint mission analysis/IPB. In the defense, this will assist the FSO in plotting his technical and tactical triggers. So, why not task the FSO to write and brief paragraph 1a of the company operations order? This will provide more time for the commander to spend on COA development. However, during this whole process, the commander and the FSO must communicate with one another to ensure that the commander is fighting the same enemy that the FSO will brief.

Master Gunner – The master gunner is the "operations NCO." In addition to his primary duties, the MG is the "CP Meister." He ensures that graphics are reproduced, combat power is tracked, routine reports are submitted, and that the terrain model is constructed IAW the commander's guidance. His primary

vision capability becomes crucial. If this sight was adapted, units must take steps not to be deceived or confused by enemy IR sources. Another limitation is that thick smoke and fog reduces both designator and IR optic capabilities.

With the development of an IR attachment to the GAS, communication would be greatly improved between mounted and dismounted forces. Dismounted infantry will have a powerful tool with or without radios to identify targets for our mounted forces. Because of the size of the device and the existence of the technologies, the cost will be relatively small. This adaptation will facilitate, command and control and increase the U.S. forces' ability to "own the night."

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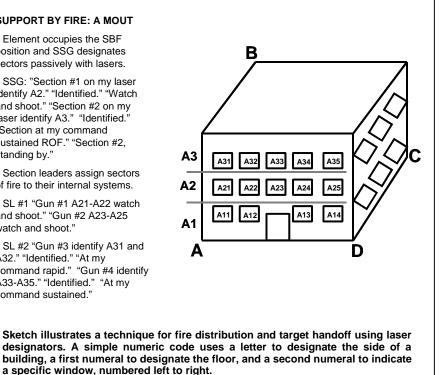
SUPPORT BY FIRE: A MOUT

• Element occupies the SBF position and SSG designates sectors passively with lasers.

• SSG: "Section #1 on my laser identify A2." "Identified." "Watch and shoot." "Section #2 on my laser identify A3." "Identified." "Section at my command sustained ROF." "Section #2, standing by."

• Section leaders assign sectors of fire to their internal systems.

• SL #1 "Gun #1 A21-A22 watch and shoot." "Gun #2 A23-A25 watch and shoot."

• SL #2 "Gun #3 identify A31 and A32." "Identified." "At my command rapid." "Gun #4 identify A33-A35." "Identified." "At my command sustained."

Sketch illustrates a technique for fire distribution and target handoff using laser designators. A simple numeric code uses a letter to designate the side of a building, a first numeral to designate the floor, and a second numeral to indicate a specific window, numbered left to right.

assistants are the command gunners, the medics, and the FIST chief... yes, the FIST chief. In defensive operations, the MG is a superb choice as CINC Dozer. He is the expert in the fire control system, he can recognize when a fighting position is constructed to standard, and he can help advise platoon leaders and tank commanders on employment of each weapons system in support of the scheme of maneuver.

The technique of delegation provides maximum daylight planning time to the platoons. Rarely do company commanders violate the $^1/_3$-$^2/_3$ rule, but when further analysis of time is conducted (relative to the time of year), we as observer/controllers, find that platoons are forced to issue orders late at night, generally not to standard, and with a low subordinate alertness level. Having said that, if detailed planning by the company commander results in late-night platoon orders, the company commander must provide specific guidance on generic rehearsals conducted

parallel with the company orders process. In performing actions on contact, obstacle reduction, and casualty evacuation drills during daylight hours, the company commander can mitigate the absence of daylight planning time from the platoons. Although, if a daylight combined arms rehearsal at the platoon level is unlikely, then the commander can elect to have all tank commanders, Bradley commanders, and squad leaders present for the company combined arms rehearsal to ensure that everyone understands the plan.

Finally, even on a very compressed timeline, the tank and mechanized infantry company/team can still maximize plan and preparation time if critical tasks are delegated. By specifying reconnaissance, generic rehearsal and assigning operations order areas of responsibility, the commander can maintain his focus on course of action development and not concern himself with performance of parallel tasks. However, the company commander's

ability to delegate the above responsibilities is directly based on the training level of the subordinate leaders.

Consequently, unless the company commander has invested time and effort in teaching and rehearsing his subordinates prior to arrival at a CTC or in a combat zone, he takes a chance that he may produce a better product on his own, while taking additional time in doing so.

CPT Mike Henderson is currently a brigade doctrine writer for the Combined Arms Doctrine Branch at Fort Knox. His previous assignments include company/team observer controller on the Timberwolf Team, CMTC, Hohenfels, Germany, and commander, D Company and HHC, 3rd Battalion, 8th Cavalry at Fort Hood, Texas. He has also served in 2-72 Armor and 4-37 Armor.

Edwin M. Wheelock and the "Skeleton Tank":

Did the original idea for the tank
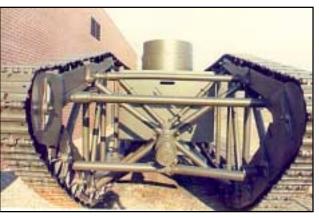## Hatch in the mind of a Yankee inventor?

by Major Dennis Gaare

Although a number of individuals, from Leonardo Da Vinci to H. G. Wells, imagined machines that are similar to modern tanks, we generally credit the invention of the tank to the British. According to the accepted wisdom, British Lieutenant Colonel Ernest D. Swinton, serving with the British Expeditionary Forces in October 1914, reached the conclusion that an armored machine capable of forcing its way through barbed-wire obstacles, climbing over trenches, and destroying or crushing machine guns was needed to break the tactical stalemate of the Western Front.

Swinton was reportedly inspired by a letter from a friend who had seen the American Holt agricultural tractor and described it as "a Yankee tractor which could climb like the devil." Swinton's proposal, forwarded to the War Office on 20 October, called for the construction of heavily armored caterpillar tractors armed with artillery pieces and machine guns.[1] Swinton simply put the readily available pieces together and came up with the tank, an invention whose time had come.

But there is another claim for the tank's origins, based on tantalizing evidence that an American tractor manufacturer from a small town in Minnesota came up with the concept before Swinton, and that he provided the British with the detailed inspiration, even the blueprints, that became the first tank.

Edwin M. Wheelock, the vice-president and general manager of the Pioneer Tractor Company, of Winona, Minnesota, claimed to have developed and documented the tank concept nearly two months before Swinton's tank proposal. He further claimed that,

Wheelock's Skeleton Tank was constructed of standard threaded pipe sections. Only the fighting compartment was armored. This design may have preceded the British concept made famous during World War I.

in hopes of generating sales of his proposed armored vehicle, he provided plans to the British that they then covertly used as the basis for the first tanks. Wheelock's assertions are given credibility by his subsequent development of the unique "Skeleton Tank" for the U.S. Army. The story is an obscure one, and newspapers friendly to Wheelock's position may be the only American record of the tale.

In August 1914, Wheelock was in Calgary, Canada, trying to close a business transaction for his tractor company. The deal hinged upon whether or not the British declared war on Germany. When they did, his business negotiations ended. On his return trip to Winona, Wheelock was searching for something to replace the tractor sales that his firm had hoped to make in Europe and the idea of an armored war machine began to dawn. By the time he arrived back in Winona, two days later, he had the tank concept quite well planned.[2]

After trying and failing to get a customer for his war machines in Canada, Wheelock engaged Frances J. Lowe to travel to England for the purpose of selling tractors and interesting the British Army in his armored caterpillar vehicle design.

In 1925, Lowe recounted his experience: "In April, 1915, I went to Europe to sell some caterpillar tractors and took with me some blueprints of a proposed 60,000-pound armored tractor made by Mr. Wheelock." Lowe went to see Colonel, Sir Henry Capel-Lofft Holden, director of mechanical transport, at the War Office in London. When Colonel Holden learned that the armored tractor plan called for a machine weighing more than 25 tons he said, according to Lowe, "Come, Come! This is another Yankee invention to win the war. It will break down any bridge in Belgium and besides, you Yanks don't know that we drive to the left of the road instead of the right, so it will block traffic as well." "Finally," Mr. Lowe says, "Colonel Holden introduced me to a Major [then Lieutenant] Wilson, who took the plans and said he would let me know if we were to get any orders, but I never heard from him until after the battle of the Somme, when it was reported that funny looking 'cheese boxes' were going over the top and chasing the Germans."[3]

Prior to Lowe's visit, the British had been struggling to make Swinton's concept work. They had not been able to achieve real cross-county mobility or trench-crossing capability. Then, shortly after Lowe's visit, the project came around. According to one account, the design work was continued under the direction of the "Landships Committee," and, a little later on, caterpillar tractors for experimental purposes were

obtained from America. In the meantime, the question of design was discussed with Sir William Tritton, of Foster's Ltd. (a company that built the first British tanks), and at the same time Lieutenant (now Major) W. G. Wilson, an experienced engineer, was brought in as consultant, and a design was evolved which eventually embodied the form finally adopted and adhered to for tanks. Thus it was through the "Landships Committee," at a moment when the military authorities were inclined to regard the difficulties connected with the problem as likely to prove insuperable, that the landship, or tank, as it was later called, was first brought into being.[4] Was it Wheelock's plans that enabled Wilson and Tritton to succeed?

The accuracy of Mr. Lowe's colorful account of proceedings is not known, but if essentially true, Mr. Lowe may have provided Major Wilson the plans and blueprints that solved the mobility problem and became the first tank. Considering that tractors of the time were massive iron machines, yet capable of cross-country mobility, it is certainly conceivable that a tractor designer formulated the designs that made the concept of a tank work. However, Major Wilson and Tritton were subsequently the individuals largely credited for the specifics of the design of the original tanks. Of course, Wheelock did not know of Swinton's proposal or the closely guarded development of tanks until news reports of the Battle of the Somme appeared in America.

No doubt motivated by his business interests and the potential for receiving award money that had been put up by the British government for the invention of the tank, Wheelock again sent his sales representative, Lowe, back to London. He wanted to determine why his company was not receiving orders for the new vehicles when it appeared that the British tanks were practically identical to the machine that he had designed and blueprinted. The trip, however, proved fruitless. Nothing could be learned, not even the disposition of his particular original designs. In his efforts, Lowe came across Tritton. "At first, Tritton thought I was a newspaper man and talked freely, but

when I asked him if he knew Holden and Wilson he asked point blank what I really was after? I told him that I wanted to get the £10,000 prize money for America and he said that under the terms of the government only British inventors could get it."[5] Wheelock never received credit for his work or any financial compensation from the British. Later, when the British government offered the prize to the inventor of the tank, Wheelock made a formal claim for it, but the British prize court awarded the money, after two different hearings, to the Englishman Swinton. It appears probable that at no time did the British authorities intend the award for anyone but a British subject.[6]

The dealings with the British were a disappointment; however, the United States would eventually get into the war and the U.S. Army would then need tanks.

With the United States' late entry into the war, the War Department focused its production efforts on a frustrating process of trying to produce existing tank designs in cooperation with both England and France. One way seen to get tanks built in a timely manner was to produce Liberty engines for the proposed Mk VIII tank that was to be fabricated in England and assembled in France. In another effort, the Ford Motor Company and the U.S. Army coordinated to build, in America, the Renault FT-17 design. Both efforts hit various snags and failed to get a single tank to the front before the armistice.

While the U.S. tried to apply the foreign designs, a small number of unproven American designs were in the works, among them a design from Wheelock and the Pioneer Tractor Company.
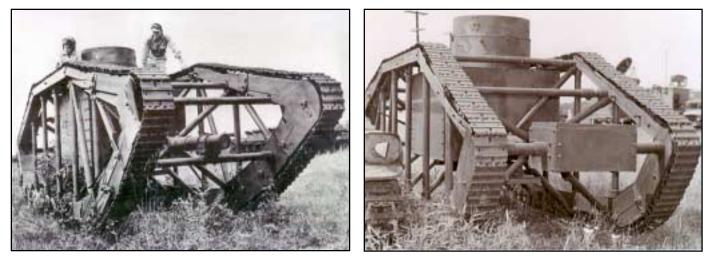
What the Army wanted from Wheelock was the combined capabilities of the two most successful tanks of the time. They wanted a tank that was nimble, efficient and a small target like the FT-17. At the same time, because trenches were the prominent feature of the WWI battlefield and they could easily swallow up the little FT-17, they also wanted to retain the trench- and obstacle-crossing capabilities of the mammoth rhomboid tanks built by the

British. The resulting hybrid was the Skeleton Tank.

Wheelock built his tank with the object of keeping weight down as much as possible without sacrificing cross-country and trench-crossing performance. A lozenge-shape was achieved in a skeleton form using ordinary iron pipes with standard plumbing connections. Suspended between the track frames was a box-like fighting and engine compartment of half-inch armor plate. This compartment carried two Beaver 4-cylinder engines, each of 50 horsepower, with forced water-cooling and a drive shaft to the front sprockets. A turret surmounted the fighting compartment and the prototype could carry a .30-caliber machine gun, though the vehicle's armament was never finalized. The prototype had a two-man crew and was 25 feet long, 8 feet 5 inches wide, and 9 feet 6 inches high. It weighed only 9 tons and had excellent performance with very low ground pressure.[7]

Years later, George K. West, an officer of the Pioneer Tractor Company at the time, described some of the original thinking that went into the design of the tank. "Wheelock built the frame of pipe so the whole outfit could be unthreaded for shipment abroad and then screwed together again. His idea in leaving the frame unprotected by armor was so enemy shells and bullets would have less of a target, only the pipes, to shoot at. His theory was that if one of the pipes was directly hit and shattered, its loss would not seriously affect operation of the tank and that if not too many of the pipes were hit and demolished in battle, they could easily be replaced afterward."[8]

There were a number of other advantages offered by this unconventional design. By using standard plumbing fixtures, steel pipe, and wood, the materials and skills needed to build and maintain the tank were already easily available. The extensive use of common off-the-shelf components would save time and money in the factory and on the battlefield.

As a fighting vehicle, the design also had interesting features. When viewed from various angles, up to half of the

Wheelock's unusual design kept weight down (9 tons) while retaining cross-country and trench-crossing capabilities. In addition, there was little for the enemy to shoot at. The pipe construction would allow the tank to be dismantled and shipped, then reassembled on arrival in theater. The two-man crew rode in the half-inch-thick armored box suspended from the frame.

vehicle's background showed through the structure. No paint scheme in the world could match that for an adaptive camouflage method. What could be seen of the vehicle was a mix of pipes, flat plates and shadows, which made the vehicle very hard to discern, compared to the large flat surfaces of the Mk IV/Mk V, tanks of similar size and shape. Additionally, since nothing but track and frame was within three feet of the ground, and given that it was so light on its tracks, the vehicle probably had a fording capability that was unmatched at the time. In fact, Wheelock tested the vehicle in the Mississippi River.

The prototype was a concept demonstration and was not intended for combat. The weapon configuration was never finalized and a fully functioning weapons station with anything more than a light machine gun would have required more developmental work. The armored compartments around critical areas were not complete, the top of the turret and engine compartment were open, as was the bottom of the differential. The hardwood and sheet metal used to house the running gear may not have held up well on the battlefield. However, they were only needed to prevent sand and dirt from throwing the track and were not critical to the tank's operation in all conditions. If damaged, they were easily replaced. (Using wood on armored vehicles is not that unusual. The FT-17 had wooden idler wheels at the time.) Bringing the prototype to the battlefield would have taken time and added weight, but it would not have invalidated the design principles.

Wheelock and the Army continually coordinated on the development and,

by October 1918, the tank was about ready to be handed over to the Army for testing and evaluation. A number of Army agencies were involved in various facets of the development, so bureaucratic procedures and contradicting opinions hampered the program. One of the Army officials visiting Winona, possibly humoring the local reporter, said that the vehicle was, "one of the most effective and most modern devices of its kind."[9] On the other hand, Major T. F. Flynn, who was sent to Winona to accept the vehicle for the Army, and was apparently unfamiliar with the program wrote, "Machine inspected and found to be of very crude construction and not at all up to Ordnance standards."[10] By the time the Army decided who was in charge, that the vehicle was what they had in fact asked for, and the last few minor mechanical problems were worked out, the armistice had been signed. Despite being lauded for its mobility, when the war ended, the Army did not feel it needed the program and any production plans were canceled.

The high point for the vehicle and its inventor probably came when the vehicle was revealed to the people of Winona. Although the vehicle had been seen driving through the shallow water on the sand bars in the Mississippi while it was being developed, there was a wartime restriction on the release of defense information and the locals probably did not know exactly what the strange contraption was. The local newspaper commented, "Winona yesterday, in the Victory day parade, got its first glimpse of a war implement that has been manufactured here and which the American government planned to use upon the battlefields of Europe. The

Hun caved before there was need of this device, but the work here had been speeded and the first of the product was in readiness for delivery when the armistice terms were signed."[11] This appearance inspired another short-lived name for the tank, the "Spider Tank." It is unclear when the name Skeleton Tank became the common identification.

Wheelock's claims against the British have never been validated and little seems to exist in records or books. Considering that he was a man who demonstrated the ability to design an innovative fighting vehicle and that his story is corroborated by reputable colleagues, it is hard to accept that his story is a lie or even an exaggeration. If true, he certainly made some business mistakes. He held no patent or any other type of ownership documentation and Lowe handed over the only set of plans without getting any type of receipt. The Pioneer Tractor Company did not do well in dealing with the U.S. Army on documentation either. The Skeleton Tank lacked plans, manuals, and procedures. After failing to get a response with written correspondence, the Army sent Captain W. E. Blaine back to Winona to retrieve the needed documentation. What he found was only one set of blueprints and a series of pencil drawings.[12] In light of their lack of emphasis on documentation, perhaps what Lowe presented to the British was of a format that it, although a viable idea and a solution to their specific problem, was not considered a serious business proposal.

Could the British have simply stolen Wheelock's ideas, down to his plans? If a foreigner had handed them an unsolicited proposal for a war machine, it

would have been only logical for them to act in their own interest. Great Britain and allies were at war with Germany and its allies. At the time, it was possible that United States could have remained neutral, in which case a contract with a private citizen for war material might not have held up. It was also conceivable that America might have even came in on the side of the Germans, in which case an American could not have been trusted with British military information or business. From a practical standpoint, it would have been very difficult to try to do business with Wheelock even if they wanted to. Lines of communication to the U.S. were long, slow, and would become risky. And, with those conditions, it would have been impossible to keep the deal a secret. Even to acknowledge that the idea had merit would have only encouraged Wheelock to seek out other customers, and at the time even the U.S. was a potential enemy. What looked like stealing to Wheelock and his company was, to the British, the prudent exploitation of documents, willingly handed over by a private citizen of a foreign country.

The other possibility is that Wilson kept the plans to himself, taking credit for the ideas as he used them. This is unlikely. Accounts of Wheelock's attempt to garner the prize money seem to indicate that no one was challenging the sincerity of his claim; they seemed to simply be collectively ignoring any American involvement. If only Wilson knew of the plans, the reaction to Wheelock's assertions would have been much different. The proceedings of the two prize courts might shed light on the issue, but that information could not be found.

The Pioneer Tractor Company was paid $15,000 for its work on the Skeleton Tank. It did not produce any other fighting vehicles and went out of business in 1928.[13] Wheelock remained in Winona with the company until 1923, when he moved to Cuba. In 1953, Wheelock, about eighty years old at the time, was living in Minneapolis. In an April 1953 letter, Wheelock, no doubt still bitter, wrote to a correspondent in Virginia, "SO MARK YOU. The conception (of the armored war tank) occurred before the British were at war with Germany, and the plans and drawings were on paper before Nov. 1, 1914."[14] What became of Wheelock after 1953 is not known. The truth behind his story may never be known and any evidence that would prove his claim is likely lost to history.

What remains is the Skeleton Tank. It was transported to Aberdeen Proving Ground in 1918 where it was tested at least into 1919, but it was never put into service. Sources vary on whether it was ever armed, but most likely it was tested with a .30-caliber machine gun. In 1945, the vehicle was turned over to the Ordnance Museum where it was displayed for years as one of the oldest and most unique vehicles in the museum's collection. In 1988, it was moved from the display area to a secure area for storage. Unfortunately, because of its size, it had to be stored outdoors and it has suffered some deterioration from the effects of weather and vegetation. In spite of that, the eighty-year-old pipes, and most of the other components, are still in good condition. The good news is that money has been allocated by the Ordnance Museum to restore the vehicle. This one-of-a-kind piece of history should be back in display condition within the next few years and on display when a facility capable of protecting the Museum's collection is available.

Notes

[1]F. Mitchell, *Tank Warfare: The Story of Tanks in the Great War* (London: Thomas Nelson and Sons, Ltd., 1933), p. 4 (from D. Wilson, *Treat'em Rough!,* Novato, Calif.: Presidio Press, 1990).

[2]B. Manderfeld, "Was former Winonan battle tank inventor*?" Winona Sunday News*, 22 August 1971: p. 8a.

[3]"American Claims Share in Prize of $150,000 for 'Tank' Invention*," New York Times,* 28 November 1925. (Clipping is incomplete; the *New York Times* is the probable source but not confirmed.)

[4]J.F.C. Fuller, *Tanks in the Great War*, 1914-1918, (London: John Murray, 1920), p. 25.

[5]"American Claims Share in Prize of $150,000 for 'Tank' Invention."

[6]Manderfeld.

[7]P. Chamberlain and C. Ellis, *A Pictorial History of the Tanks of the World 1915-45*, (Harrisburg, Pa.: Stackpole Books, 1972).

[8]"Man Who Designed War Tractor, Former Winonan, Never Received Reward For Tank's Invention," *The Winona Republican,* 31 June 1942.

[9]"Winona Sees Spider Tank, Product of Local Concern On Streets Here On Monday," *The Winona Independent,* 12 November 1918, p. 6.

[10]T.F. Flynn, Memorandum, 15 November 1918.

[11]"Winona Sees Spider Tank..."

[12]U.S. Army Ordnance Department, Memorandum, 14 April 1919.

[13]Manderfeld.

[14]Ibid.

(Source information provided by Eric Sayer Peterson, Leo D. Johns, and the U.S. Army Ordnance Museum.)

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The Military Decision-making Process: Integrating Analog and Digital TTPs

by Captain Timothy S. Jacobsen

For many leaders, the Military Decision-making Process (MDMP) is viewed as a painful but necessary process to be avoided if at all possible. Their typical reaction — short-cutting the process — usually leads to a unit's demise at the CMTCs.

Over the course of the last year, our plans cell integrated some simple analog and digital TTPs (tactics, techniques, and procedures) that made our MDMP a quicker, easier, and less painful process without deleting or short-cutting any steps.

Please note that, as a result of the frequent software upgrades to the ABCS (Army Battle Command System) computers, I did not include TTPs specific to these computers because they would most likely be obsolete prior to publication. Instead, the digital TTPs focus more on generic digital TTPs that would be compatible with any version of ABCS software.

The first key to success is an ongoing MDMP train-up. MDMP is a perishable skill and being well-versed in it makes the process much more fluid and shorter. This train-up includes identifying your TTPs prior to and during the train-up and then rehearsing those TTPs during the train-up. Several general TTPs for simplifying the MDMP:

Analog and Digital TTPs

● Create a detailed list of all the minute tasks that need to be accomplished during each step of the MDMP. Assign primary and alternate members of the plans cell to each task on the list. Who copies and distributes higher orders to the BOSs (Battlefield Operating Systems) when they are published? Who makes the graphics? Who writes the risk assessment? [See Figure 1. All figures follow this article, beginning on Page 43.] Practice these assigned tasks in the train-up. This way everyone knows what to do without being told. The entire process becomes a battle drill for the plans cell.

● Cross-train tasks so that when one BOS finishes their piece of the MDMP they can provide assistance to the other overwhelmed BOSs. Too often, these efforts are compartmentalized. Cross-training makes the work load of the MDMP more equitable across all the BOSs.

● Create an MS Excel spreadsheet that breaks down the MDMP, by phase, into percentages of time needed. For example, columns that read "Mission Analysis 20%," "Mission Analysis Brief 5%," "COA Development 10%," etc. Then, include rows with the various total amounts of time available to mission execution, i.e., "12 hours," "18 hours," "24 hours," "72 hours," or whatever is applicable. Have that number divided up by the $1/3$-$2/3$ rule, $1/4$-$3/4$, or $1/5$-$4/5$, whichever your unit uses. Then set up equations that calculate times for each step of the MDMP based on the percentages and total time available. [See Figure 2] Once created, this tool will be invaluable in establishing an initial timeline — one that is reasonable, understood by all, and plausible. If trained under different time-constrained environments, this tool allows a staff to optimize their use of time to produce a decent product.

● Develop a system for RFIs (Requests for Information), both for RFIs to higher headquarters and RFIs from subordinate units. Designate one person to manage each — to be as proficient as necessary, this should be that person's primary task, for example, the designated person might be one of the LNOs (liaison officers). Each maintains a log and through either analog or digital means submits, answers, or refers the RFIs. A good analog RFI model is to have pre-made carbon RFI sheets created by the print plant, with a copy maintained by the requester, a copy maintained in the log, and a copy to higher headquarters. A good digital RFI model is to submit RFIs on pre-formatted MS PowerPoint slides over the tactical internet. This digital method is much faster than hand delivery by LNO, if you have the means.

Digital TTPs

Set up a LAN within the plans cell, with all computers connected. Create shared folders on each BOS computer so that everyone can access any briefings, orders, annexes, or matrices within the cell. This saves more time than any other TTP we used. In a digitized unit, you can go one step further by having higher and lower headquarters share folders; this technique promotes parallel planning, and eases distribution of MDMP products and orders.

Establish a naming convention for files (and folders) based on the OPORD number and what the file is. For example, *00-10-01 ATK – Annex B Intel*. Otherwise, you will end up with several files titled *Attack Annex* or *WARNO #1* with no idea exactly what files contain.

The more specific TTPs are organized by MDMP step, as per FM 101-5:

Step 1: Receipt of Mission

Digital: Ensure the higher headquarters shares out folders where they keep their MDMP products, in addition to posting orders to their tactical internet site. This allows maximum parallel planning, because at any time anyone connected to the tactical internet can observe the higher headquarters MDMP products in progress and pull orders that are posted. At the same time, share out your folders to allow subordinate units to parallel plan with you.

STEP 2: Mission Analysis

Analog and Digital: When reading through and analyzing the higher headquarters order, use different color highlighters to differentiate between different types of information. For example, highlight all specified tasks in blue, all constraints in pink, available assets in orange, etc. This makes it much easier and quicker to organize information for analysis, briefings, and orders.

Analog and Digital: Pre-format as many parts of the mission analysis as you can to speed up the process. For example, have mission statements already written for each type of operation, so that all you have to do is add in the date-time-group, task, and purpose. Pre-format WARNOs so that an NCO can cut and paste necessary sections from the higher headquarters order without the planner writing it from scratch each time.

Analog and Digital: Make a list of preset initial CCIR (Commander's Critical Information Requirements) for each type of operation. Minor adjustments will have to be made, of course, based on the specifics from the higher headquarters order, but at least you won't be starting from ground zero each time. Initial PIR (Priority Intelligence Requirements), the initial R&S (Reconnaissance & Surveillance) plan, should focus on confirming/denying enemy courses of action. Continue to develop and refine CCIR throughout the MDMP.

Analog and Digital: Create an IPB (Intelligence Preparation of the Battlefield) team to assist the S2 in this step of mission analysis. The team should contain, at a minimum, the S2 planner, R&S planner, an engineer planner, and an MI/intel planner. Using a team method speeds up the process and helps to prevent compartmentalization of information between the BOSs.

Digital: Get the DTSS (Digital Terrain Support System) team to print up maps that have the MCOO (Modified Combined Obstacle Overlay) already on them. They can add different colors for various slopes/restricted terrain, add mobility corridors, even add good OP (observation post) locations and a unit's TIRS (Terrain Index Reference System). These maps can be printed at any scale and distributed throughout the unit, so everyone is on the same sheet of music. This prevents the engineer planner from having to recreate a new MCOO and re-analyze the terrain for each new operation. Using this in conjunction with Terrabase II and Mr. SID can provide invaluable terrain analysis.

Digital: Create an MS Excel spreadsheet template for mission analysis, containing all the necessary information (specified tasks, assets available, constraints, etc.). [See Figure 3] Share this file, so that each BOS can open it simultaneously and update specified tasks, assets, constraints, etc. As each BOS updates this information and saves it, it populates everyone else's spreadsheets, as well as the master file. In addition, other spreadsheets can be created to assist in the mission analysis process. For example, a combat power comparison chart can be made with mathematical formulas and the combat correction factors that automatically calculates your combat power ratios. These can then easily be transferred into a pre-formatted mission analysis briefing presentation.

STEP 3: Course of Action (COA) Development

Analog and Digital: Create a commander's guidance checklist. Use the one in Appendix B of *FM 101-5-1* as a guideline, then let each BOS planner figure out what specifically he/she needs to know from the commander. Turn this into a quick reference checklist for the commander to use each time; it will prevent anything from being missed and allow the commander to express himself in a logical order that everyone understands. Lay a blank overlay over the map and allow the commander to draw several quick sketches of the COAs he wants to fight. Use a micro-cassette recorder to record the commander's guidance. You can then reference it throughout the MDMP and avoid having staff officers ask, "Now what exactly did the commander say he wanted to do there?"

Analog and Digital: Have the DTSS Team print up a 1-to-25,000 scale map with MCOO, mobility corridors, OPs, and TIRS. Laminate it, and post it in the plans cell to use for drawing up COA sketches and wargaming. It allows everyone to gather around it and still be able to see, and can be used for OPORD briefings so the entire audience can see.

Analog and Digital: Create a pre-formatted concept statement/paragraph that only requires changing the specifics of the statement to fit the current operation. Use the statement on page 5-15 of *FM 101-5* as a base model and adapt it to fit the commander and planners' preferences. This pre-written statement serves as a template to speed up the process and prevent the accidental omission of any part of the statement.

Analog and Digital: COA development is actually the first wargame if done properly, and is conducted by several key members of the plans cell. Determine how to best meet the com-mander's guidance, array forces based on combat power ratios, and develop various schemes of maneuver based on the following model, from *FM 101-5*:

1. Analyze relative combat power.

2. Generate options.

   a. Determine the decisive point

   b. Determine the purpose to be achieved at the decisive point (main effort)

   c. Determine the purposes of the supporting efforts

   d. Determine the task at the decisive point (main effort)

   e. Determine the tasks of the supporting efforts

3. Array initial forces.

4. Develop the scheme of maneuver.

5. Assign headquarters.

6. Prepare COA statements and sketches.

Analog and Digital: As a part of COA development, create a more detailed R&S plan, to include a rear area R&S plan. Rear area reconnaissance, surveillance, and security are frequently overlooked when developing an R&S plan. This lack of rear area security allows enemy dismounted reconnaissance teams and special operations forces to operate in rear areas without opposition, causing havoc. A technique that worked well for us was to divide up the area behind the LD (line of departure) or your maneuvering forces, and assign each unit an area of responsibility. Come up with a standard for evaluating threat levels of rear area security. For example, statuses could be:

Green - Cleared by dismounted patrols within 12 hours (all areas within direct fire range of friendly forces need to be this status)

Amber - Cleared by aerial division reconnaissance team (DRT) sweeps within 24 hours (all areas within observation of friendly forces need to be this status)

Red - Not cleared within the last 24 hours (areas outside of observation and direct fire range of friendly forces can be this status)

Analog and Digital: Create pre-planned TIRS for ease of controlling unit movements. Use prominent terrain features. Integrate the TIRS into the

plan, starting during COA development. Reference the TIRS in orders, rehearsals, and during the battle for better command and control. It can also be used as a part of the naming convention for numbering NAIs (named areas of interest), TAIs (targeted areas of interest), OPs, ABFs (attack-by-fire positions), etc.

Analog and Digital: Come up with a specific task list with detailed definitions based on *FM 101-5-1,* but with the commander's intentions integrated into them. In this way, everyone in the unit knows exactly what is expected of them when given a particular task. For example, the *FM 101-5-1* definitions of *block* and *fix* are as follows:

Block: To deny the enemy access to a given area or to prevent enemy advance in a given direction or an avenue of approach.

Fix: To prevent the enemy from moving any part of his forces either from a specific location or for a specific period of time by holding or surrounding them to prevent their withdrawal for use elsewhere.

When a unit is given the task to *block,* can they allow the enemy to escape as long as they deny the enemy the directed terrain? Some commanders say yes; some say no. Some commanders believe that to *fix* the enemy is an implied task in *block.* Find out your commander's expectations and integrate them into specific definitions for your unit. Some definitions in *FM 101-5-1,* such as *defeat,* are very vague and leave much to the imagination of the unit executing the operation. Remove the ambiguity, quantify all of the tasks, so everyone knows exactly what the commander wants.

Analog and Digital: Create a specific graphics-naming convention, not just in the usual sense of naming all brigade objectives after football teams, etc., but by assigning certain names to each unit. For example, 1-22 IN's objectives are always OBJ Rams and OBJ Chiefs; 1-66 AR's objectives are always OBJ Steelers and OBJ Patriots; and 3-66 AR's objectives are always OBJ Seahawks and OBJ 49ers. This way, at just a glance at the graphics without any order, 1-66 AR immediately knows where their objective is and what the overall brigade concept looks like. Do this with all major graphic control measures; publish it in advance, and train it. Operations will become much

simpler and easier to understand, facilitating higher proficiency in units.

Analog and Digital: Conduct the COA brief as directed as optional in *FM 101-5.* Use this as a kind of azimuth check with the commander to ensure that the COAs created and the initial commander's intent drawn up are in accordance with his guidance.

Analog and Digital: Using the Maps & Overlays function of the MCS (Maneuver Control System) or MCS-Light (a laptop version of the MCS), begin creating the graphics digitally based on the COAs developed. Refine the digital graphics throughout the remainder of the MDMP. [This graphic can be viewed on the *ARMOR* website under the "Downloads" link at: *www.knox. army.mil/armormag*.]

STEP 4: Course of Action (COA) Analysis

Analog and Digital: COA analysis is really the second wargame conducted during the MDMP. The keys to a successful COA analysis are coming to the wargame with fully developed COAs (both friendly and enemy), understanding what assumptions remain unanswered, and having a strictly regimented system for wargaming using action/reaction/counteraction, designated critical events, and a timeline. The XO or S3 should referee the wargaming with an iron fist to enforce adherence to the established system.

Analog and Digital: Everyone is familiar with the typical event template showing time phase lines for enemy movement and differences in enemy courses of action. Create a friendly event template as well, focusing especially on time phase lines. With both of these event templates, you can fast forward to any critical event in an operation and still keep the time-distance in perspective. Many units wargame an operation from start to finish, taking several hours just to do one COA. Using these two event templates, a unit can fast forward and only wargame the critical events, allowing time to do multiple COAs.

Analog and Digital: Wargame on a 1:25,000 scale map (a DTSS one would be best). Place a blank sheet of acetate on top of the map and all overlays. Use this to record changes/additions to the graphics without destroying the original overlays.

Analog and Digital: The critical data to come out of the wargame are a spe-

cific set of CCIR, a list of decision points (DPs), coordinated branch plans, and the identification and mitigation of tactical risks. Many units focus only on the synchronization of BOSs, but this is only one small part of what needs to come out of MDMP wargames. CCIR are only the pieces of information that the commander requires to make decisions. Some units list excessive CCIR that they think the commander should know, even if that information is not necessary for the commander to make decisions. For example, the location of enemy dismounted recon, loss of a sensitive item, or location of Q36 radar. This information is important, but will not usually cause the commander to change his course of action/scheme of maneuver. All CCIR are tied to decision points. Other important friendly or enemy information that does not cause the commander to change the scheme of maneuver fall under IR (Information Requirements) rather than CCIR. Both are important, and listed in WARNOs/OPORDs under coordinating instructions. CCIR are refined all throughout the MDMP process. For example, the initial PIR created during mission analysis should focus on confirming/denying enemy COAs, but by the time you get to COA analysis, some of the initial PIR are getting answered, and by the time the order is issued, PIR (along with the other CCIR) become triggers at decision points to initiate branch plans. Fully develop all branch plans by integrating the BOSs, quickly wargame through the branch plans at the end of the base wargame, and publish the branch plans in the Scheme of Maneuver paragraph of the OPORD. Additionally, consider identifying tactical risks, and either make minor adjustments to the course of action or develop branch plans to counter potential problems. Spell out these risks and controls, along with the safety risks, in the overall Risk Assessment Worksheet for that operation. Ensure a detailed DSM (Decision Support Matrix) is used to record all of the decision points, the associated CCIR, and the branch plans. Also publish the DSM as a part of the OPORD for commanders and staffs to use and fight from.

Digital: Create an MS Excel spreadsheet synchronization matrix template, containing all necessary information for each BOS. [See Figure 4] Share this file, and each BOS can open it simultaneously and update information during the wargame. As each BOS updates this information and saves it, it popu-

lates everyone else's spreadsheets, along with the master file. Using this format while wargaming has several benefits. First, it frees up whoever used to be the recorder to do something more productive. Second, it speeds up the wargame since you no longer have to wait on the recorder to get all the information on the sync matrix. Everyone can continue to enter the information as the wargame continues. The process can be speeded up even more if only friendly and enemy maneuver are discussed during the wargame. Using the shared sync matrix allows this because the information from the other BOSs is still captured — non-maneuver BOSs continue to enter information into the shared sync matrix while the maneuver action/reaction/counteraction is being discussed. This dramatically increases the speed of wargaming, permitting multiple COAs to be wargamed in the same amount of time most units could only accomplish one COA.

Digital: Some units may also have planning computer systems that permit digital wargaming, such as the BPV (Battlefield Planning and Visualization computer). The current systems are helpful only under certain circumstances, due to the large amount of time necessary to input all required information. The exceptions are if higher headquarters provides the data files for the BPV containing some of the required information, or if there is a substantial amount of planning time — more than 36 hours. Otherwise, with the current systems and software, the use of these planning systems is too cumbersome and time-consuming to be feasible.

STEP 5: Course of Action (COA) Comparison

Analog and Digital: Have the commander designate or approve the evaluation criteria early in the MDMP, so the staff can analyze the COAs throughout COA development and COA analysis. Each BOS should keep track of the positive and negative aspects of each COA, especially in respect to the command-designated evaluation criteria, so by the time COA analysis is complete, the staff is ready to quickly organize their comments and conduct a COA decision briefing with the commander. Each BOS presents their findings for each COA, and then the staff collectively recommends their best choice COA.

STEP 6: Course of Action (COA) Approval

Analog and Digital: During COA Approval, conduct a third and final wargame of the MDMP process. This wargame is not a fighting wargame, but a by-phase synchronization drill to ensure all BOSs are integrated into the plan. This wargame amounts to the S2 giving an enemy set for that phase, followed by each BOS in turn discussing how their assets are integrated into the fight, focusing on triggers and event timing. No action/reaction/counteraction is done during this wargame. If a shared synchronization matrix is used as discussed earlier, then this wargame amounts to little more than reviewing the sync matrix.

Notes on Wargames

Throughout this article, I discussed three distinct wargames used during different steps of the MDMP. COA development, if done properly, is the first wargame. The second wargame, during COA analysis, should consist of wargaming multiple friendly COAs against multiple enemy COAs. It is time-consuming, possibly even unfeasible, to conduct a full synchronization wargame for each COA.

To save time without cutting corners, COA analysis should be done through action/reaction/counteraction by the S2, S3, and fire supporter. All other BOSs observe, but should speak by exception only. The purpose of these wargames is not to synchronize the BOSs, but to evaluate each friendly COA to determine which will most effectively achieve the unit's purpose. In COA approval, once the commander has approved the friendly COA, the unit should conduct the third and final wargame. This wargame is the detailed BOS synchronization necessary for orders production.

Many units try to accomplish this BOS synchronization for each COA during COA analysis, leading to staffs either wargaming only one COA or several with little detail. Therefore, only conduct this detailed BOS synchronization wargame on one COA, the COA already approved by the commander. The MDMP proves to be most efficient and effective using this three-wargame method.

Digital: Occasionally, the commander is tied up elsewhere, and is unavailable to make the decision. ABCS-equipped units have the ability to "drag and drop" files from one computer's shared folders to another's shared folders. Using this function for transporting files, the planners can send COAs and recommendations to the commander wherever he may be: at the TOC, the TAC, or at a subordinate unit; anywhere that also has ABCS systems.

The commander then can review the files and approve a particular COA without actually attending a COA decision briefing at the plans cell.

STEP 7: Orders Production

Digital: Using the Maps & Overlays function of the MCS or MCS-Light, complete the graphics digitally, based on the approved COA and branch plans developed. These overlays can be saved as a file and distributed digitally along with the orders. For redundancy in overlay distribution there are a couple of options. First, send them digitally along with the orders as discussed below. Second, if you get a 36-inch plotter (we used a HP DesignJet 755CM), you can print the overlays from the MCS or MCS-Light directly onto paper or acetate designed for the plotter. The paper copy is just like a Diazo printout, only much more legible. The acetate copy can be laid directly on a map. The MCS systems allow you to print to any map scale accurately. These digital overlays are better for several reasons. They save time and manpower by freeing up soldiers who would normally hand-copy numerous overlays. Additionally, every digital and hard copy overlay is identical. This prevents the unintentional distortion of overlays by soldiers who hand copy them with little to no sleep, and ultimately can prevent fratricide.

Digital: In the ideal world where digital file transfers occur flawlessly and every attached unit has digital systems, there is no need for multiple means of redundancy. However, regardless of how digital a unit may be, it will almost always have analog units attached to it, and file transfers will frequently not reach every unit, so redundancy is necessary. There are many ways to ensure every unit receives all the information they need.

First, post all MDMP products and orders on the division's tactical internet web page. Any digital unit can then access this using Internet Explorer or Netscape.

Position (Name)	Receipt of Order	Mission Analysis	COA Development	COA Analysis/Wargaming	Orders Production
CDR	❑ Review Division Order	❑ Attend MA Brief ❑ Give Commander's Guidance	❑ Attend COA Brief ❑ Give refinement guidance	❑ Receive Wargame update from XO ❑ Give refinement guidance	❑ Attend OPORD Brief ❑ Brief Commander's Intent
XO	❑ Review Division Order ❑ Establish Initial Timeline	❑ Supervise MA ❑ Sync staff for MA Brief ❑ Attend MA Brief ❑ Enforce Timeline	❑ Supervise COA Development ❑ Sync staff for COA Brief ❑ Attend COA Brief ❑ Enforce Timeline	❑ Drive Wargame ❑ Identify strengths and weaknesses for each COA ❑ Update CDR on Wargame results ❑ Enforce Timeline	❑ Supervise OPORD production ❑ Sync staff for OPORD Brief ❑ Attend OPORD Brief ❑ Enforce Timeline
S2/S2 Planner	❑ Read Base Order and Intel Annex ❑ Begin IPB ❑ Begin Mission Analysis ❑ Advise R&S Planner on NAIs and R&S Plan	❑ Complete IPB ❑ Complete MCOO ❑ Determine effects of terrain and weather ❑ Complete SITTEMPs ❑ Determine possible enemy COAs ❑ Develop proposed PIR ❑ Provide slides to S3 Plans Clerk for MA Brief ❑ Provide WARNO #2 info to S3 Plans NCO	❑ Advise R&S Planner on NAIs and R&S Plan ❑ Refine SITTEMPs and enemy COAs ❑ Sync with other BOSs	❑ Fight enemy most probable COA ❑ Advise R&S Planner on NAIs and R&S Plan ❑ Provide WARNO #3 info to S3 Plans NCO	❑ Refine Intel Annex ❑ Provide slides to S3 Plans Clerk for OPORD Brief
S2 Plans Clerk	❑ Copy Division Overlays ❑ Assist S2 Planner	❑ Refine digital overlays/SITTEMPs ❑ Assist S2 Planner	❑ Refine digital overlays/SITTEMPs ❑ Assist S2 Planner	❑ Refine digital overlays/SITTEMPs ❑ Assist S2 Planner	❑ Finish digital overlays/SITTEMPs ❑ Assist S2 Planner
R&S Planner	❑ Read Base Order and Intel Annex ❑ Begin IPB ❑ Begin Mission Analysis ❑ Begin R&S Plan	❑ Complete IPB ❑ Identify R&S facts, assumptions, constraints, tasks, and forces available ❑ Advise S2 on enemy recon ❑ Provide slides to S3 Plans Clerk for MA Brief ❑ Initial R&S Plan complete ❑ Provide WARNO #2 info to S3 Plans NCO	❑ Provide R&S concept to S3 Planner ❑ Refine initial R&S Plan ❑ Sync with other BOSs	❑ Final R&S Plan complete ❑ Employ recon assets according to plan when directed ❑ Provide WARNO #3 info to S3 Plans NCO	❑ Refine R&S Annex
S3/S3 Planner	❑ Read Base Order ❑ Begin Mission Analysis ❑ Provide WARNO #1 info to S3 Plans NCO	❑ Analyze mission, intent, and concept 2 levels higher ❑ Identify Maneuver facts, assumptions, constraints, tasks, and forces available ❑ Propose a restated mission ❑ Provide slides to S3 Plans Clerk for MA Brief ❑ Provide WARNO #2 info to S3 Plans NCO	❑ Develop COA sketch and statement ❑ Begin developing scheme of maneuver ❑ Provide slides to S3 Plans Clerk for COA Brief ❑ Sync with other BOSs	❑ Fight friendly COAs ❑ Refine COAs ❑ Develop DSM and DST ❑ Provide WARNO #3 info to S3 Plans NCO	❑ Write Base OPORD and Task Org ❑ Supervise assembly of OPORD and all overlays
S3 Plans NCO	❑ Write/Consolidate WARNO #1 ❑ Assist S3 Planner	❑ Identify risks to the force and risks to the mission ❑ Write/Consolidate WARNO #2 ❑ Assist S3 Planner	❑ Refine risks to the force and risks to the mission ❑ Begin writing WARNO #3 ❑ Assist S3 Planner	❑ Write/Consolidate WARNO #3 ❑ Assist S3 Planner	❑ Conduct risk assessment ❑ Assist S3 Planner

Figure 1: Example partial list of MDMP Duties & Responsibilities. (An expanded version of duties and responsibilities is available on our website under the "Downloads" link at: *www.knox.army.mil/armormag*.

Second, send products and orders via ABCS systems — either by the "drag and drop" method or by FTP (File Transfer Protocol).

Third, give a verbal orders briefing, if possible.

Finally, hand out hard copies of the order to unit commanders or LNOs. These multiple routes of publishing MDMP products and orders ensures situational awareness about the upcoming operation throughout the unit.

Digital: In order to talk digitally across the tactical internet between computers, you currently need to know the computer's IP address. IP addresses frequently look like *190.34.145.21*, and remembering sets of numbers for each computer can be difficult. Create an IP address book that lists any and all computers you might need to communicate with, to include: higher headquarters, other staff sections, the TOC, the TAC, the rear CP, and subordinate units. This makes products and orders distribution much more efficient. Eventually, systems will allow e-mail style digital address books on the computers that facilitate this even more. Setting these up in advance significantly reduces the initial difficulty of fighting with digital systems.

Whether an analog or digital unit, the implementation of simple TTPs can speed up and ease the process without deleting or shortcutting the MDMP. With these and other TTPs, units can create a Plans SOP that facilitates more frequent and painless training and execution of the MDMP. With MDMP skills being so perishable, it is also important for staffs to practice the MDMP monthly, especially if there is a high turnover of personnel in the plans cell.

The MDMP can be very effective if done in an efficient manner. Unfortunately, most staffs muddle through sometimes vague guidelines, and develop their own methods for utilizing the MDMP, often unsuccessfully. These TTPs will allow both new and experienced staffs to conduct the MDMP more efficiently, without having to reinvent the wheel.

For more information, digital copies of products, or comments please e-mail me at:

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TIME TO MISSION EXECUTION	PLANNING TIME (IN MINS)	MISSION ANALYSIS (IN MINS)	MISS ANAL BRIEFING (IN MINS)	COA DEVELOP (IN MINS)	WARGAME (IN MINS)	ORDER PREP (IN MINS)	TOTAL TIME AVAIL (IN HRS)
TOTAL HRS	1/4 Time	20%	5%	10%	30%	35%	
2	30	6	2	3	9	11	0.5
4	60	12	3	6	18	21	1.0
6	90	18	5	9	27	32	1.5
8	120	24	6	12	36	42	2.0
10	150	30	8	15	45	53	2.5
12	180	36	9	18	54	63	3.0
14	210	42	11	21	63	74	3.5
16	240	48	12	24	72	84	4.0
18	270	54	14	27	81	95	4.5
20	300	60	15	30	90	105	5.0
22	330	66	17	33	99	116	5.5
24	360	72	18	36	108	126	6.0
26	390	78	20	39	117	137	6.5
28	420	84	21	42	126	147	7.0
30	450	90	23	45	135	158	7.5
32	480	96	24	48	144	168	8.0
34	510	102	26	51	153	179	8.5
36	540	108	27	54	162	189	9.0
38	570	114	29	57	171	200	9.5
40	600	120	30	60	180	210	10.0
42	630	126	32	63	189	221	10.5
44	660	132	33	66	198	231	11.0
46	690	138	35	69	207	242	11.5
48	720	144	36	72	216	252	12.0
50	750	150	38	75	225	263	12.5
52	780	156	39	78	234	273	13.0
54	810	162	41	81	243	284	13.5
56	840	168	42	84	252	294	14.0
58	870	174	44	87	261	305	14.5
60	900	180	45	90	270	315	15.0
62	930	186	47	93	279	326	15.5
64	960	192	48	96	288	336	16.0
66	990	198	50	99	297	347	16.5
68	1020	204	51	102	306	357	17.0
70	1050	210	53	105	315	368	17.5
72	1080	216	54	108	324	378	18.0
74	1110	222	56	111	333	389	18.5
76	1140	228	57	114	342	399	19.0
78	1170	234	59	117	351	410	19.5
80	1200	240	60	120	360	420	20.0
82	1230	246	62	123	369	431	20.5
84	1260	252	63	126	378	441	21.0
86	1290	258	65	129	387	452	21.5
88	1320	264	66	132	396	462	22.0
90	1350	270	68	135	405	473	22.5
92	1380	276	69	138	414	483	23.0
94	1410	282	71	141	423	494	23.5
96	1440	288	72	144	432	504	24.0
98	1470	294	74	147	441	515	24.5
100	1500	300	75	150	450	525	25.0
102	1530	306	77	153	459	536	25.5
104	1560	312	78	156	468	546	26.0
106	1590	318	80	159	477	557	26.5
108	1620	324	81	162	486	567	27.0
110	1650	330	83	165	495	578	27.5
112	1680	336	84	168	504	588	28.0
114	1710	342	86	171	513	599	28.5
116	1740	348	87	174	522	609	29.0
118	1770	354	89	177	531	620	29.5
120	1800	360	90	180	540	630	30.0
TOTAL HRS	1/4 Time	20%	5%	10%	30%	35%	

Figure 2: Example MDMP Planning Time Guidelines

Figure 3: Example Partial Shared Mission Analysis Matrix

Figure 4: Example Partial Shared Synchronization Matrix

	A	B	C	D	E	F
1	Phase	H + 54	H + 56	H + 58	H + 60	H + 62
2						
3		12/13/2000 00:00	12/13/2000 02:00	12/13/2000 04:00	12/13/2000 06:00	12/13/2000 08:00
4	1 BCT Actions in Division					
5	Wargame					
6	1 BCT Wargame Critical Events					
7	Phase	4 - 2nd TE	4 - 2nd TE	4 - 2nd TE	4 - 2nd TE	4 - 2nd TE
8						
9	Assumptions					
10	Evaluation Criteria					
11	Constraints (FSCMs, LOAs etc)					
12						
13	Enemy Actions					
14	Enemy Artillery					
15	DP		DP 3. 1-10 CAV flank guard from PL POTOMAC to PL YALU	DP 4. The OrO Corps boundary shift is active vicinity X4	DP 5. Establish blocking position at ABF 4	
16						
17	CCIR					
18	PIR					
19			PIR 3a. Is 32nd Mech BDE CATK vic. PL Potomac. PIR 3b. Is a Bil of 3rd ABN DIV CATK vic. PL Potomac	PIR 4a. Is the strength of enemy units at X3 greater than those at X4? PIR 4b. Is the strength of enemy defensive positions at NAI R113 & R114	PIR 5a. Are elements of the 12th AR Battalion CATK from 2BCT zone vicinity PL KANSAS	
20						
21	NAI			NAI R113 (OBJ JACKSONVILLE)	NAI R107	
22				NAI R114 (OBJ DOVER)	NAI R103	
23				NAI R115 (ROUTES TO OBJ MIAMI)		
24				NAI R116 (ROUTES NORTH OUT OF OBJ JACKSONVILLE)		
25	Primary OBS			G/10	1-10 CAV	
26				G/10	1-10 CAV	

Armor Captain's Career Course
– Distance Learning (AC3-DL):
Update on the Spearhead to the Future

The new Armor Captain's Career Course (AC3) is now available on the Internet, providing an exciting, new way for Armor and Cavalry officers to complete their required military education using innovative, leading-edge technologies.

Fort Knox Armor School has produced the first Internet-based officer advanced course. The school's pioneering work has been recognized by the United States Distance Learning Association, which cited the School in its 1999 award for excellence.

The new course, replacing a paper-based correspondence course, is called the Armor Captain's Career Course – Distance Learning, or AC3-DL. It is a virtual reality and live environment that allows geographically dispersed students and instructors to collaborate in real time. Assistance is available in every phase of the course.

AC3–DL has three phases: IA, asynchronous self-paced lessons; IB, synchronous IDT weekends with instructor connected, and a two-week resident ADT phase II. It is possible for an eligible officer, usually a first lieutenant or captain, to complete AC3-DL in as little as 14 months; however, the normal completion time is 24 months.

Soldiers in the AC3-DL course are trained to the same standard as a resident course student. The new course improves on the old paper-based course, which only trained company commanders. AC3-DL also trains staff skills for assistant operations officers at the battalion and brigade level, providing in-depth lessons on the military decision-making process (MDMP), intelligence preparation of the battlefield (IPB), and troop-leading procedures (TLP). It is important to note that the instructor-in-the-loop ensures the student officer will receive quality training that replicates the training in the resident AC3 course.

Currently, there are about 140 officers enrolled with the expectation of graduating about 60-75 per year. AC3-DL does not require any paper-based products, connection to video teleconference, or any legacy means of distance or distributed learning tools. Except for the two-week resident phase, all course lessons are Internet-based. In addition to motivation, all the student officer needs is a computer with minimal specifications that is capable of accessing the Internet. This may be from his home, his armory, or virtually any location with a computer and telephone line.

AC3-DL follows the proven learning methodology of crawl, walk, and run. AC3-DL features performance-oriented instruction, streaming audio, video, and animation. Digital maps and overlays are built into a "Virtual TOC" along with other advanced courseware techniques such as "Firefights," pop quizzes to test learning, "mouseovers," explanatory text (which appears with graphics or other text to explain certain points), pre- and post-lesson tests, and volume gate tests. The student officer is kept aware of how well he is progressing in the self-paced phase 1A, with success defined as a post-test grade of 70 percent or more on each module. Unlike past distance learning methods, AC3-DL maintains an instructor "in the loop." After learning the basics of a new competency, and successfully completing a series of computer-graded exams, the student sends (via e-mail) his work to his instructor for review. The instructor also periodically monitors all student progress using the AC3-DL student management database.

AC3-DL planned improvements for 2001 were to include the following: adding text to lessons indicating the estimated time to complete a lesson; insertion of Honor Code directions into the course overview and each gate test instructions; conversion of the military decision-making process, intelligence preparation of the battlefield, and conversion of CS/CSS to shorter lessons; identification of "mouseovers" which can be printable; identification of selected graphics for resizing; and examination of any redundancies in the "Firefights."

In addition, the Armor School has an aggressive improvement program planned, and we expect to continue to implement these improvements. Remember, if you plan to stay in the Army National Guard as an officer, AC3-DL provides the "way-ahead." For information and enrollment, see your unit school manager, who can enroll you through ATRRS. If assistance is needed, call MAJ Chet Guyer at DSN 464-7601, commercial (502) 624-7601, or Pete Borosky, LTC, USA, Ret., at 464-3809, commercial (502) 624-3809. Once enrolled, you will receive a welcome letter and instructions about how to access the course.

Encountering Media
On the Battlefield:
Will You Be Prepared?

tional security (OPSEC), and other pertinent matters. Use the time before an interview to go over probable questions and come up with accurate, reasonable answers. Be prepared to talk about your current mission and your part in the overall operation. This is also your chance to make sure your uniform is squared away — remember, you represent the Army.

A public affairs representative may not always be available. In that event, don't forget to check the reporter's credentials and to contact your higher headquarters. Be aware that your mission still comes first. If they are interfering, be polite but firm in reminding them you have a mission to accomplish. This, too, is part of the agreement they sign when reporters receive the credentials. Neither you nor your soldiers can detain reporters, their tapes, notepads, or their equipment. Never try to grab or confiscate their cameras. If there is a security risk, such as reporters at a gate, you can search them and their equipment prior to allowing them to pass. Again, be polite but firm, and explain as you go along that you are searching as a security precaution. This is important because that soldier at the gate is often the reporter's first impression, and sets the tone for the rest of the interview.

Reporters will, at a minimum, want to talk to whomever is in charge. If time and mission permits, they may also want to talk to other soldiers in your unit. It is always a good idea to know which soldiers have no problems talking about their specific job, and more importantly, who will portray a positive outlook.

Prior to starting the interview, set the ground rules up front. Let the media representative know how much time you have for the interview. Five to ten minutes is preferred, and is usually adequate. Remind them that you will not discuss future operations or specifics of your current operation. Never agree to an interview "off the record." Always assume that there is a live microphone, and everything is being recorded. Usually, you can give your name, rank, unit and position. However, the current guidance during this time of crisis is to only give your first

name for the purpose of force protection. This came about, in part, from incidents during the Kosovo air war, when many families of the Air Force pilots interviewed by media received threats.

While conducting the interview, there are several things to keep in mind. First and foremost is OPSEC. Avoid giving specifics of your unit. A now-famous example of this is the Navy SEAL team washing up on the shore of Somalia under the floodlights of reporters. The reporters had pieced together the information about the team's landing location from other interviews they conducted.

Also, use broad, generalistic terms in your responses. For example, instead of saying, "I have 36 soldiers in my platoon," say instead, "I have a standard-sized light infantry platoon." If you are pressured for more information, continue to use broad terms. "Around thirty," is acceptable. During the train-up and execution of our most recent Warfighter Exercise (WFX), we went a step further by using the same broad, general terms during our daily press briefings. We described our losses as "light," "medium," or "heavy," and avoided using specific numbers. We described the size of the division as, "a standard-sized light infantry division, with all of the equipment available at that level." With that information being just a few clicks away for a reporter on the internet, it is an acceptable answer. Never discuss specific dates, future operations or rules of engagement.

The other side of the OPSEC issue is trying to hide behind the line, "that's classified." What you have to ask yourself is: is it **really** classified? For example, if your unit has a piece of equipment that is out in plain sight, it probably is not classified. If you know for sure that something is classified, go ahead and state that you won't discuss it for security reasons. Should you inadvertently state something during the course of the interview that is sensitive, stay calm. Go ahead and tell the reporter that the information is sensitive and ask them not to use it. Immediately after the interview, inform your higher headquarters and your public affairs office. This goes back to the accredita-

tion of the journalists when arriving in the area of operations. They are required to sign an agreement that if they stumble upon information that is sensitive, they will not use it. If they do use it anyway, that is grounds for them, and possibly their entire news organization, to have their credentials pulled. Remember they do not want to burn those bridges. They want those future stories.

Just as important as OPSEC is to never lie to a reporter. It destroys credibility for anything else you say. If you don't know the answer to a question, do not be embarrassed to say, "I don't know." Along that same line, don't guess, speculate or be caught answering hypothetical questions. This is a major reason not to discuss rules of engagement at all. Hypothetical questions dealing with ROE can give the enemy insight into how much he can get away with before we respond.

Another thing to avoid saying is, "no comment." Using that term almost always implies you are trying to hide something. If you do not have any information, simply state that you don't have any information to provide at this time. If you do not feel comfortable answering a particular question, do not be afraid to refer it to the public affairs representative.

The tone of the interview should be relaxed, but cautious. You are in control of the interview. You have the right to stop it at any time, even if you are short of the time you initially promised. Avoid calling the reporter "sir" or "ma'am." Use their name instead, this helps to put you more at ease while speaking. When answering a question, stop and think about what you want to say before you speak.

Don't worry about the pause before you answer. If it is to be broadcast, it will be edited out before it is used, and if it is for print publication, obviously you won't read a pause. Explain things in terms that someone not knowledgeable about the military will understand. A simple rule to use is to think of yourself answering a question raised by your parents. Also, be sure to speak slowly and clearly.

An advanced technique is to try working a "command message" into your answer. By a command message, we mean a standard, positive message that we want to get across. A good example of this comes from the MRE example earlier. That same commander was asked to summarize the purpose of the

demonstration he encountered. His response was, "They were protesting the SFOR contingent over something that they thought was unfair. But that's okay, because we are here to keep them safe and help them build a democracy. In a democracy, people have the right to peacefully demonstrate. If they feel safe enough to protest, then we're obviously doing our job right." Here, the commander had a great command message, "…we are here to keep them safe and help them build a democracy." The point about people in a democracy having the right to protest was especially good, because it then made the entire response relevant. Before you interview, the public affairs officer will review the current command messages for your use.

When closing the interview, end on a positive note. Use this opportunity to clear up anything you feel you didn't explain well enough, or anything you want to reinforce. If the reporter asks if there is anything you would like to add, resist the usual practice of just saying, "Hi, mom." Instead, use that last opportunity to get in one last command message.

Media Training in Your Unit

As leaders, you have resources available to train yourself and your soldiers for dealing with the media. Through the public affairs office, you can request assistance during a training exercise or a stand-alone class. Usually, for media training during an exercise, a team of soldiers who role-play as civilian reporters will show up at your training site. You can time their arrival to meet your specific training objectives, but keep in mind; like the real world, they may or may not be escorted by a public affairs representative. This allows your soldiers to learn how to handle the media by reinforcing what can and cannot be done. Reiterate that they cannot detain reporters or their equipment, and searches are authorized only when there is a genuine security concern.

For the purposes of maximizing the training value, get as many of your soldiers on camera as possible. Afterwards, during a pause in the exercise or at the end, have a public affairs representative review the tape with your soldiers as a group and discuss things to sustain and things to improve. During the WFX, it was a training requirement for at least each battalion commander to give an interview. In that case, we gave a quick on-the-spot brief-

ing of what he did well and what he could improve. Experience shows that the soldiers enjoy this training, as it is different and they get to see their efforts on camera. Seeing themselves on camera also reinforces what things they did well and what they can work on for next time. For leaders, it can give an idea of which soldiers to keep in mind when the time comes for real-world media.

A refresher class on media training can be implemented during a train-up for deployment. This can be conducted during soldier readiness checks, or during individual readiness training. This class will include the same basics of media awareness, but will probably be more tailored to the mission in regards to command messages and OPSEC.

Media training does not have to stop at the soldier level. Spouses and other family members can use parts of this training as well. During the recent deployment of 10th Mountain soldiers, the Public Affairs Office gave a presentation on media awareness at family support group meetings. In the past, these presentations have been well received.

If real-world media do visit your training site, they should be kept separate from the role-playing media. The public affairs representative will handle this, but it is important to keep in mind. Other than that, the conduct of the interview should be no different. By putting these discussed techniques into use, it should be a good training tool to prepare you and your soldiers dealing with media on the battlefield.

Referring back to the patrol analogy, we owe it to the American people as well as the Army to tell our story. Once we understand our situation, we must report it to our higher headquarters, the American people. The only way we can communicate with our higher is to use our available tool, the media. Remember, the media always gets their story. We can either help them get the story that portrays the Army in a positive light, or we can ignore them and take our chances.

CPT Jeffrey P. Nors was a rifle and anti-tank platoon leader in the 2nd Battalion, 22nd Infantry at Fort Drum, N.Y., prior to serving as executive officer for HHC, 10th Mountain Division. He is currently in command of the 27th Public Affairs Detachment at Fort Drum.

It might be better to bring back the M108 as an M108A1: 105mm Royal Ordnance howitzer with a 17km range, 30mm Bushmaster II Chain Gun co-ax for direct fire targets, modified commander's turret with an Mk 19 40-mm HVGL/7.62mm minigun (a Vietnam-era AH-1 *Cobra* chin turret based system) with the ability to elevate to 75 degrees, appliqué armor, LRF/BC and an M113 variant as its Field Artillery Ammunition Supply Vehicle, also with the *Cobra* turret. The key is to keep the vehicle weight under 16 tons so it can land via C130 on an unimproved runway. My worry is an M109 chassis won't fit in the C130 and the turret might be too tall if it did. So, would the USAF be willing to risk large airlifters close to a battle zone to bring in artillery? Are there other options for C130 compatibility? Yes, but cost and time get in the way. However, since the LAV III doesn't fit on a C130 and exceeds the 16-ton limit, an M113-based 105mm howitzer/direct fire system variant would be cheaper and available more quickly. As an example, cut off the M113 top deck, place a new top deck with the M108A1 turret in place and you're ready to go. You might want to check *G2mil.com* for other ideas and comments on the same subject.

LARRY A. ALTERSITZ
LTC (Ret.), FA

"India's Tank Fleet" Missed German Engines, Transmissions

Dear Sir:

In the September-October 2001 issue of *ARMOR,* I read your interesting article on India's tank fleet. I think it is very positive that *ARMOR* reports about foreign tanks on a regular basis.

However, I believe there was a mistake concerning the power pack of the Arjun tank (page 31). The production batch of 124 MBTs is equipped with a diesel engine mtu MB 838 Ka-501 and a fully automatic transmission of RENK AG RK 304 S with four forward, two reverse gears and a mechanical 4-speed steering system. For your information, I enclose an article from the company magazine mtu Report, edition 1/2001 of mtu Friedrichshafen GmbH, 88038 Friedrichshafen, Germany. Unfortunately, I only have the article in German language.

GERHARD WITTMANN

Correction to Unit Listing

On page 42, we erroneously listed the 1-14 RSTA Sqdn of I Corps, 2 ID, as 1-14 RECCA Sqdn. The unit is equipped with IAVs and HMMWVs.

Also, 1-33 Armor was listed as part of I Corps, 2 ID, but is now part of 1st Bde, 25 ID.

REVIEWS

Spirit, Blood, and Treasure, edited by Donald Vandergriff, Presidio Press, Novato, Calif., 2001, 424 pages, $34.95.

Editor Donald Vandergriff has compiled a useful, if slightly unfocused, collection of articles examining what he considers the central challenge of the modern defense establishment: how to adapt to the new paradigm of warfare in the 21st century. The editor, an *ARMOR* contributor, believes that our third-generation armed forces are hamstrung, spiritually and physically, when faced with the lurking threat of fourth-generation combat. This requires fundamental changes in equipment, culture, organization, and acquisition… well, just about everything.

Vandergriff offers an excellent introduction that summarizes his view of the problem, while his line-up of authors address various slices of the reform pie. The articles are grouped into three categories: People, Ideas, and Hardware/Budgets. The subjects covered range from revamping the infantry squad to overhauling the federal budgetary process. There is a central theme, however, running through these otherwise disparate pieces, that gives this book a modicum of coherence. It is a reflection of the Toffler-esque observation that a society makes war like it makes money. Vandergriff *et al* want the Defense Department to use information technology to allow for greater decentralization while exploiting the talents of specialists working within a commander's intent. This applies to tactics, to assignment and promotion of personnel, or to the purchase of hardware. In other words, we need to embrace the tenets of fourth-generation warfare, or risk defeat.

The smorgasbord of articles is both a strength and weakness of the book. In general, the quality is high — no Hackworth-style diatribes or ghostwritten glorified press releases that seem to fill most of the professional journals nowadays. There are a few exceptions. John Poole's article on minimizing the use of force suffers from radical-chic operational theory and egregiously bad history; John Tillson's suggestions on reforming the personnel system is on target in identifying the problem, but I shudder to think of the consequences if his solutions are ever foisted on the Army. The rest of the selections range from pedestrian (albeit useful) to truly innovative or revelatory. Most of them cover ground that will be very familiar to thoughtful professionals — there is actually very little here that I would categorize as revolutionary in scope or tone — but I suspect that everyone will find some material here to learn from. I certainly found Franklin Spinney's excellent piece on the budget process an eye-opener, and Daniel Moore's and Christopher Yunker's article on carrier operations should be required reading in Newport.

I offer, then, a qualified recommendation for this book. It will have a very short shelf life, as all works of this nature do, but it is a well-balanced and judicious look at issues that must be resolved soon if we are to adapt successfully to life after the Cold War.

STEVE EDEN
LTC, Armor
Fort Knox, Ky.

Somalia on $5.00 a Day, A Soldier's Story by Martin Stanton, Presidio Press, Novato, Calif., 2000, 299 pages, $24.95 hardcover.

Read this book. Marty Stanton has done all of us a service. Stanton wrote of his experiences, warts and all, during his tour of duty in Somalia on Operation Restore Hope. He pulls no punches talking about what went well, what was fouled up, and how he and his battalion S3 section and the battalion command team and staff of TF 2-87 IN played the hand they had been dealt in the poker game that was Somalia. He gives the "big picture" and then what he and his battalion did when faced with a series of situations dealing with bandits, NGOs, clan elders, and our own national policy.

I was serving on the XVIII Airborne Corps staff when Operation Restore Hope started. The driving concerns coming from Washington appeared to be: keep the number of troops in theater under the strength ceiling, and suffer no casualties. Stanton faced the on-the-ground reality of the troop ceiling. He describes the incredible challenges of covering a huge area with a light infantry battalion that walked to the fight. The missions changed, the conditions changed, but the troopers of TF 2-87 soldiered on.

The struggle of the troop ceiling as a means of controlling "mission creep" and the need to accomplish missions in the name of force protection comes across loud and clear. Deployed commanders are hard pressed to say, "No, we can't do that." They are in theater and must deal with the situation as it changes on the ground. Stanton shows us that the troop ceiling effectively limited legitimate operations that were needed to accomplish force objectives. I know that the ceilings come from policy makers, but as war is an extension of policy, those of us who serve, or will serve, in D.C. must make civilians understand what is needed to attain policy objectives and ensure it *is* enough to afford the field commander freedom of action.

Personnel policy mandates also plagued the battalion. Stanton described having to take a company commander out of command in theater in order to meet the requirements of the captain's functional area education requirements. Stanton's battalion lost men to ANCOC, CAS3, as well as the steady drain of emergency leaves and non-battle injury. He effectively describes the feeling of "no one outside Somalia" understands what we are doing, and he was right. If our Army corrects one thing based on this report and our growing experience with the new forms of war we are facing, it must be that our personnel policy must realize the nature of deployments and leave troops in place for the duration of the operation.

I was struck by one portion of the book, one that reminded me of an episode in Larteguy's book about a French colonial parachute regiment in Algeria, *The Centurions*. Stanton describes a counter-bandit operation wherein TF 2-87 beat the bushes for bandit hideouts, much like they'd operated at the Joint Readiness Training Center when fighting OPFOR guerrillas. He then realized that the bandits were living in the town, and thus the task force had to adapt its operations to patrolling the towns where the bandits lived. Based on this and other experiences, Stanton outlines extremely useful lessons learned in this book.

This is a superb book written from the heart. Here is what American soldiers will face in the new age we live in — war that is not quite war, but men still facing fire. Stanton and his troopers faced fire with honor.

Stanton's book has an honored place on my bookshelf. I'll read this one over and over again. This is a soldier's report written for soldiers. I intend to recommend it to my civilian friends as well. As I wrote in the opening line, **read this book!**

COL KEVIN C.M. BENSON
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MIT Security Studies Program

The Battle for Kursk 1943: The Soviet General Staff Study translated and edited by David M. Glantz and Harold S. Orenstein, Frank Cass Publishers, London, 1999, 349 pages, $62.50.

Until the 1990s, most students of World War II recognized that the Red Army was the force most responsible for defeating Nazi Germany, but there was an unwillingness to give the Soviets their due. Many writers argued that the Russians overwhelmed the Germans with manpower ratios as high as 15-1. The problem with this interpretation is that the Germans proved in 1940 that they could defeat a force superior in size with better weapons. The reluctance to give the Soviets the credit they had rightly earned is easy to fathom. The West had to rehabilitate the Germans if they were going to be accepted as allies. There was an equal reluctance to build up a nation that might easily become the next great enemy. The Soviet regime denied historians access to their archives because the Red Army planned to use the same tactics and doctrine against NATO forces should the Cold War turn into World War III.

The beginning of the end for the Third Reich came in 1943. The Battle of Kursk was Hitler's last offensive in the East. For a week the Germans made only limited gains. Then,

outside the village of Prokhorovka, the Fourth Panzer Army and the Fifth Guards Tank Army fought the biggest tank battle ever. The Fifth Guards failed in their mission of going on the offensive, but their defensive victory brought the German effort to an end. A Soviet counteroffensive then sent the Germans reeling. Anyone doubting the factors behind the outcome should read this study. In 1940, the Germans defeated the British-French-Belgium force with local superiority at the various points of contact and a better tactical use of German tanks. Three years later, the Soviets dominated the local scenes of action and used better defensive tactics than their Western allies had employed earlier in the war. The organization of this study makes sense, starting with a chapter that provides an overall assessment of the situation the Red Army faced on the eve of the battle. Chapters follow on defensive preparations, German operations, and the battle itself. The study then moves into a topical examination of the combat and combat support branches during this engagement. The only shortcoming of the Soviet General Staff was their failure to devote full chapters to the important issues of logistics and intelligence. As the editors note, the study also tends to overestimate the German strength, which is understandable given the limited information of combat, and ignores an examination of the costs of the engagement. The study focuses on operational matters and is free of ideological baggage even if it uses some loaded terms to describe the Germans.

Maps are the main shortcoming of this volume. The editors used the Soviet originals, but the quality of these 50-year-old images was never that great to begin with and are often irregular in size. As a result, the published versions have weak, thin lines, are missing important terrain details, and often appear on two pages making it difficult to make sense of things when the binding gets in the way. The editors have added several maps at the end of this work, which makes up for some of the problems with the originals, but a couple of them are also poor in quality.

Should active duty Armor personnel bother to read this work? Yes, this work was designed for a professional audience. A reader can profit from examining this study as a good example of a through report and a staff producing optimal work even while operating under the stress of war.

NICHOLAS EVAN SARANTAKES
Texas A&M University-Commerce

Clash of Arms, How the Allies Won in Normandy by Russell A. Hart, Lynne Rienne Publishers, Boulder, Colo., 2001, 469 pages, with index, $79.95.

Professor Russell Hart is the newest in a line of academic military historians to attempt the resurrection of the reputation of the American army in the Second World War. In this effort, he is largely successful. This work is the most comprehensive, academically grounded and logical evaluation of the relative combat capabilities of the four armies in Normandy to date. Hart's evidence is solid, his arguments reasonable, and in *Clash of Arms* he brings something new to the table, a comparative analysis of American, British, Canadian and German combat effectiveness that no other scholar has attempted to date in this depth. I strongly recommend this book to professionals.

As historian Dennis Showalter notes in the foreword to this work, "since 1945 a virtual cult of the Wehrmacht has emerged among its former enemies." Hart notes that until the emergence of a broader strain of military history appeared in the 1970s and 1980s, Germany's former opponents (and most especially we Americans) generally accepted the sanitized version of German army military history that emerged in the immediate post-war period. Much of that history relied upon the testimony of German army generals and generally subscribed to the idea that the *Heer* (army) was apolitical. A sort of "Nazis? Nope, no Nazis here," approach developed for several reasons, not the least of which was our very real need to rearm the Germans in the face of Soviet intransigence and the developing Cold War. The reverse side of that trend was a general denigration of American combat abilities and the idea that we won the war only through the mass of material that we, as a nation, could produce and throw at the Germans. Hart reverses this trend with authority. America's greatest strength, it appears, was not just our ability to wage "materialschlact," but our ability to adapt and change to the conditions as they were, not as we wanted them to be.

The book is divided into two parts. Fully half the book is taken up with an analysis of what went on in the development of the national military forces of all four subject nations prior to the Normandy Campaign of 1944. Starting with the Interwar period (WWI to WWII) Hart delves deeply into the foundations of military theory, the relation of theory to practical resource limitations, and the interaction of both with the culture of the armed forces of all four nations. Although this portion of the book rests fairly heavily upon secondary scholarship, Hart is generally on solid ground here. If there is any critique to be made it is that he is probably too soft on the Americans during this period, setting them up as adaptive and willing to learn when the reality was that the interwar period was one of our worst, not just economically but culturally. The interwar U.S. Army fostered a divisive culture of reactive "us against them" conflict, and both sides were American. (Branch warfare inside the ground forces, the ground-vs.-air fighting, Army vs. liberal civilians, etc.) So in this one small area, it appears that Hart is too kind by half.

The next four chapters, however, make this book worth the purchase price in a variety of ways. Each chapter delves deeply and deals with the experiences of one nation between 1939 and June 1944. Each chapter could stand alone as a monograph, which makes them perfectly suited for OPDs, or to supplement a battalion commander's "Required Reading List" for lieutenants pulling duty (assuming the unit is creating a "Battalion Library" and will foot the cost of purchase of a copy). The chapter on the Americans alone is fascinating. Learning how the American Army expanded from around 225,000 to 1.5 million in 18 months, then from there to more than 7 million in another year and a half, is interesting. Learning how we did all of this and simultaneously managed to learn (or unlearn as required) how to beat the Germans on the battlefield is a perfect case study for professionals today. Although Hart devotes a chapter to this, it boils down to a simple sentence. The Americans, unlike their allies, were culturally willing to toss aside equipment and ideas that did not work as demonstrated on the battlefield and search for things (equipment, doctrine, organizations) that did work. That is no small statement, and it takes Hart a chapter to prove it, but it is a chapter well worth reading.

In contrast to the Americans, our British allies, according to Hart (himself an Englishman), were hamstrung initially by a strong aversion to professionalism in the officer corps, and more importantly to a cultural tendency to follow a top-down approach. To be sure, there were bright spots. The British developed a very effective air-to-ground system that brought in effective Close Air Support (CAS). (Which, it should be noted, the Americans copied quickly and shamelessly, because it worked and their method did not.) At the same time he noted what he refers to as, "a weakness that plagued the British Army throughout the war: its vulnerable morale." As generally sympathetic as Hart is with the Americans, he seems to be very critical of British performance throughout. Still, by 1944 they had largely overcome their lack of interwar doctrinal foresight and developed a doctrine of firepower-based attrition that worked well enough to defeat most German forces arrayed against them.

Hart also addresses the Canadians and the Germans, and a more sophisticated picture of both emerges from his analysis. The Canadians suffered from the effects of near total demobilization in the interwar period, and, as a result, ended up fighting with equipment and doctrine that was essentially British. Hart's assessment was that they were a "poor clone" of the evolving British way of war. The Germans, with sound doctrine from the start, generally did well, and adapted to circumstances throughout the war. Here Hart's evaluation closely echoes that of some other recent scholars as he points out that while the tactical proficiency of the German *Heer* was fairly high, it was a lack of foresight and a cultural predisposition to undervalue supporting arms that created a fatal weakness in their system. In short, they made great tanks (and other weapons) that were useless because they could not be

resupplied. Too much attention went to the development and construction of wonderful weapons like the Panther and King Tiger, and not enough to the fielding of trucks. The result was that their panzers were tied, indirectly, to horse-drawn logistics. Hart also notes that the effects of Nazism reinforced the fighting ability of many German soldiers (as repugnant as that may be), but in the ultimate test of arms, all of their institutional flexibility at the cutting edge was secondary to their blind-spot just behind the front lines.

This is a solid work of analytical military history. Despite the title, Normandy is not necessarily the most important element found in this book. Every page, and most especially the half of the book leading up to the case study of the fighting in Normandy, contains information useful to professionals. It is a book that causes one to stop and consider our own military and our own professional culture and ask, "Are we flexible and adaptive?" In the end, that seems to be the most important military criteria of them all.

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Desert War: The North African Campaign, 1940-1943 by Alan Moorehead, Penguin Books, New York, 2001, 641 pages, $19.00.

Desert War: The North African Campaign 1940-1943 is three books combined into one volume written by newspaper correspondent Alan Moorehead. *Desert War* is far from a definitive history of the North African campaign, rather much more of a rambling personal story of war. If one is looking for detailed accounts of the battles, the tactical doctrine of armored warfare in the 1940s, or an analysis of the American contribution to the campaign, then this is not the book to read. However, if one wants to experience an intimate account of the warfare, politics, geography, and diplomacy in North Africa, Moorehead's account is worth the time. His descriptions of the campaign are so detailed, fresh, and exciting that it is hard to put down once opened.

The reader follows the author in his journeys throughout a large part of the Middle East and Africa during the early phases of World War II. One travels from Egypt and Libya to Kenya, Ethiopia, Syria, Iraq, and Iran, with additional side trips to the United States and India. Traveling by boat, borrowed airplane, car, and foot, the reader experiences not only the battles, but also the sights, sounds, and smells of warfare. Moorehead writes in a typical journalistic style, complete with detailed metaphoric descriptions of his experiences. On the down side, the reader loses a sense of proportion because Moorehead is telling his story, and not providing a broader history of the campaign. However, the greatest disappointment

of the book is the author's failure to adequately address the American contribution to the war. Granted, the American armies did not arrive until late 1942, but one reference to Patton and four to Eisenhower are less than acceptable. Moorehead's lack of maps is also an annoyance, and unless one is extremely familiar with North Africa, an atlas is necessary to follow most of the action.

Despite these shortcomings, Moorehead's book is entertaining, enjoyable, and enlightening. The reader becomes disappointed when the book ends because one is eager to board a ship and travel with the allied armies to Sicily.

JOHN M. KEEFE
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Army of Hope, Army of Alienation: Culture and Contradiction in the American Army Communities of Cold War Germany by John P. Hawkins, Praeger Publishers, Westport, Conn., 2001, 332 pages, Appendix, Notes, Bibliography, Index, $68.00.

Army of Hope, Army of Alienation is an anthropological study of soldiers and their families residing in Germany from 1986 to 1988. It chronicles military communities as they deal with the stresses associated with being the 'tip of the sword' facing the Soviet army during the Cold War. The author, a professor of anthropology at Brigham Young University, and a Medical Service Corps officer of the U.S. Army Reserve, lived in and observed a German military community during the years indicated. The Department of Military Psychiatry (now called Soldier and Family Studies), Division of Neuropsychiatry, Walter Reed Army Institute of Research sanctioned his work.

During his stay, the author interviewed over one hundred members of the community, including enlisted soldiers, NCOs, commanders, family members, and civilian employees. He lists these in an appendix in which he identifies his subjects by fictitious names so as to spare them any repercussions. The author also does not identify the subject military community, using instead a composite description.

The purpose of this work is to show how living in close proximity to danger, such as that posed by the Cold War, creates stress to such a degree that those in the community lose sight of their reasons for being there and react to the stress with careerism. According to the author, this careerism pervaded every level of the community and had a divisive impact on morale. His premise is that the low morale was unique to an assignment in Germany. That is, stateside units did not experience such problems. His purpose for publishing the study now — 13 years after completion — is to suggest that

the same problems exist in the post-Cold War Army, even in stateside assignments. The idea is that reading this study will somehow better enable current Army leaders to deal with morale problems in the twenty-first century.

This book, while shrouded in academic clothes, is nothing more than a loose collection of the predictable whining that soldiers, and those associated with soldiers, are wont to do. No subject escapes this study. It is chock-full of stories of woe regarding housing, the PX, medical care, the job, evaluations, and on into infinity. Every soldier, civilian, or family member throughout the history of this or any other army has complained at one time or another about every one of the issues brought out in this book. Why the author would think that these issues are unique to Germany, the subject community, or the time period studied is beyond comprehension.

This book offers nothing of use to the soldier. Those who do read it will either accept the tall tales, or discount them as routine griping, depending upon their own convictions regarding the Army. Either way, they will not learn much that will make them better leaders. It is good that this book is so expensive, as the price will probably cause the book to stay where it belongs; on library and bookstore shelves.

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Lost Soldiers by James Webb, Bantam, New York, 2001, 384, $25.00.

Lost Soldiers is a novel about a former U.S. Marine-turned investigator. He travels extensively throughout Vietnam to search for lost prisoners of war and those missing in action. He uncovers things that he did not bargain for — deceit, falsehoods, and cowardice complicate the investigation and pursuit with interesting twists. Unfortunately, this was not enough to keep me turning the pages. The book got very detailed in areas that didn't need to be. There is no doubt that James Webb is a subject matter expert and very educated as a traveler throughout Vietnam; however, for anyone looking for a simple story, like myself, it was a bit much. This would be a fine study in a literature class about a man's struggle with himself, society's prejudices, and the foes of the past, but not a book that I could read over and over again.

I would not recommend *Lost Soldiers* to my Cavalry brothers unless they were into critical reading. This isn't a Tom Clancy novel; that is for sure.

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Cavalry Scout
TAC NCO
West Point, N.Y.

Panzer IV: The Panzerkampfwagen IV Medium Tank, 1939-1945 by Kevin Hjermstad, Squadron/Signal Productions, Carrollton, Texas, 2000, 64 pages, $9.95 (ISBN 0-89747-413-9).

Advantages: Good primer on the Pzkw IV series of tanks.

Disadvantages: No sourcing of photos, competing in a busy environment.

Rating: Highly recommended.

Recommendation: For modelers and historians not familiar with the mainstay tank of the German Wehrmacht for most of the Second World War.

Most publishers recognize a natural hierarchy of military historical books. Aircraft books outsell all others by a wide margin, quoted variously as being from three to six times that of any other genre. German WWII subjects outsell all others by a similar ratio. The result is that a new book on German aircraft or armor runs into a very competitive market because many publishers will choose these subjects as salable.

As a result, in many cases we get very bad books with many all-too-familiar pictures. In other cases, very good books tend to get overlooked or remaindered as of little interest even when they have good subjects and fresh photos. At the end of the day, it is up to the customer and historian to rate the subjects, either with their pocketbooks or their assessments.

This is the first book in Squadron/Signal's new "Armor Special" series, as opposed to the more familiar and popular "In Action" series, which set the standard for all of the other competitors out there, such as Schiffer, Concord, and Armada. This book comes from a new author, Kevin Hjermstad, and covers the basic differences in the various Panzerkampfwagen IV tanks, from their initial production in 1937 to the final models built in 1945. The book has around 180 photos and eight pages of color side views of the tank as it evolved, showing how paint schemes changed to meet the area and threat environment. Although the book is very well done, my one complaint is that none of the photos are sourced, nor is there any credit given as to where the photos originated. I freely admit to having no knowledge of whether the photos are "fresh" or not, but they are all new to me and appear very well selected to match the author's focus.

The main problem is that I am not sure how this book will be received. It is better than the same publisher's "In Action" volume on the Pzkw IV, as it is much bigger, and contains more and better photos. But again, it is competing with the earlier Squadron book and the similar Schiffer products. And the "nuts and bolts" crowd would probably prefer the books from Spielberger and Jentz/Doyle, so I am not sure if they will be interested in this book as well. This is kind of a shame, as it is

really a pretty good overview of the tank. Most modelers will be happy with it as it provides enough information to do a good job with the DML and Tamiya kits of this vehicle.

COOKIE SEWELL
AMPS

War in Korea: 1950-1953 by D.M. Giangreco, Presidio Press, Inc., Novato, Calif., 2000, 352 pages, $50.00, hardcover.

If, as the old saying goes, "A picture is worth a thousand words," D.M. Giangreco really gives readers their money's worth. This lavishly illustrated book of more than 500 black-and-white photographs captures the essence of the Korean War, the "Forgotten War" or, as some of my airborne buddies who served with the 187th ARCT (The Rakkasans) in Korea note, "Communism's First Defeat."

The author is the design editor at *Military Review,* and has written other books on military/political subjects. The Korean War, like all wars, is politics with heavy machinery and a cast of hundreds of thousands. It starts by having both the West and the Communists misreading what the other said. As the war begins, we see the result of U.S. occupation forces in Japan being mentally and physically unprepared for possible action. The cry of "No more Task Force Smiths" goes back to the Korean War's opening month, and it shows how an ill-prepared. and poorly armed unit was crushed by the advancing North Korean Peoples Army (NKPA). His description of Korea ("Korea is roughly the size of California south of San Francisco or Italy north of Naples. It enjoys the pleasant climate of neither.") will bring back memories of the weather to all who served there.

The map at the beginning of each chapter shows the ebb and flow of the war, and where the main fighting occurred. The retreat to Pusan, the build-up of forces in the Pusan perimeter, the landing at Inchon, the pursuit north to retake Seoul, changing war aims, overconfidence, and an unwillingness to face unpleasant realities, the Chinese Communist Forces (CCF) intervention, with the Chosin Reservoir withdrawal and the Hungnam evacuation, the retreat below Seoul (Seoul changed hands four times during the War, Pyong'yang twice), the removal of MacArthur, Ridgway's leadership in the march north in the spring of 1951, the air and sea wars, the stalemate along the front from the summer of 1951, vicious small unit actions, the last big pushes by the CCF/NKPA to grab land and "punish" the ROK Army literally up to the signing of the documents, and the final signing of the armistice are covered succinctly in the accompanying text. Mr. Giangreco illuminates the role other UN forces played in the fighting, and also deals with the murder of POWs and civilians by the NKPA/CCF. His pictures of psychological operations on both sides and the problems

with the prisoner repatriation (that one issue held up the armistice for 15 months) were very informative. He points out that the French battalion with the 2nd Infantry Division left Korea for Vietnam, and became the core of *Groupement Mobile 100,* destroyed by the Viet Minh in a series of ambushes that stretched over 30 miles. Read Bernard Fall's *Street Without Joy* to see the problem of being road-bound against a light infantry force in restrictive terrain.

But what struck me was the extent of Korea's up-and-down terrain. I never served there, so I wasn't really sure what is was like. I recently got a new CD program called the *Rand McNally New Millennium World Atlas Deluxe* to help me better visualize terrain in places of interest to me. I'm a gunner; I look at terrain because I have to be able to best support the commander's intent and his plan of movement to achieve his objectives, while figuring out how best to stop the other guy from preventing our success. My preference for field artillery is self-propelled (my first unit was 5/14th FA — 155mm M109, without any suffixes — 2AD at Ft. Hood a few years ago), and lots of that. You can never have too much of certain things: good companions, ammunition, and firepower are good examples. As *aficionados* and practitioners of mobile warfare know, Korea will never be mistaken for Ft. Hood or Riley, so how does the constraint of terrain affect the use of armored forces? Will it be platoons attached to support light infantry, dug in as hardened, mobile pillboxes to control areas, restricted by terrain and lack of engineer support? Will the only real battalion-sized armor fights happen in the opening stages, when both sides clash before each air force tries to hunt tanks, a la Kosovo? Are we learning how to better use armor in restricted terrain, like Kosovo, against potential anti-armor hunter-killer teams? And what do those hills mean to our Cavalry brethren, flying helicopters against an enemy who knows how we will fight?

This is an excellent book for all soldiers to read and would be a perfect addition to a unit or personal library. It reminds everyone of the eternal truth written in another great book on Korea, T.R. Fehrenbach's *This Kind of War:* "...You may fly over a land forever; you may bomb it, atomize it, pulverize it and wipe it clean of life — but if you desire to defend it, protect it and keep it for civilization, you must do this on the ground, the way the Roman legions did, by putting your young men in the mud." Since the end of WWII, pundits have proclaimed the end of Armor and the Army. Since then, all the military actions we have seen merely reinforce what Fehrenbach stated. It might be wise for all of us to think about war in compartmentalized spaces, and thank Mr. Giangreco for bringing the reality of that kind of fighting to light in such a powerful way.

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Installation of Under Armor Auxiliary Power Unit Finally Begins on M1A2 SEP Tanks

A Fort Hood tank battalion, 3-67 Armor, is receiving the first examples of a long-awaited auxiliary power unit that provides electrical and hydraulic power while the tank's main engine is turned off. The Under Armor Auxiliary Power Unit (UAAPU) provides electrical and hydraulic power, cutting fuel use and wear on the main power plant.

Fielding of the unit had been delayed because of funding problems, but the first four units were delivered earlier this year and there are plans to install the UAAPUs on 966 of the M1A2 SEP tanks.

The UAAPU is installed in the left rear of the tank's hull, replacing a 55-gallon fuel cell. It is operated from the driver's compartment and draws its fuel from the tank's main fuel system.

The 590-pound unit includes a turbine engine and generator set that provides 6kW of electrical power to charge the tank's main batteries. Previously, when a tank was stopped for a long period, the crew either shut down the main engine and operated on batteries, or kept the main engine going, con-suming large amounts of fuel. The UAAPU reduces vehicle fuel consumption by approximately 8.5 gallons per hour. It also reduces the vehicle's thermal signature, compared to operating the main engine.

The Fort Hood unit that received the initial conversions used the tanks during the 4th ID's Division Capstone Exercise at the National Training Center, and they were declared a resounding success.

Veterans say auxiliary power units on tanks are not a new idea, and were installed on some tanks as far back as World War II, when they were called "pony engines." But these were usually crude add-ons that operated outside the tank's armor envelope. In contrast, the new unit, as the name suggests, is integrated into, and protected by, the M1A2's armored hull.