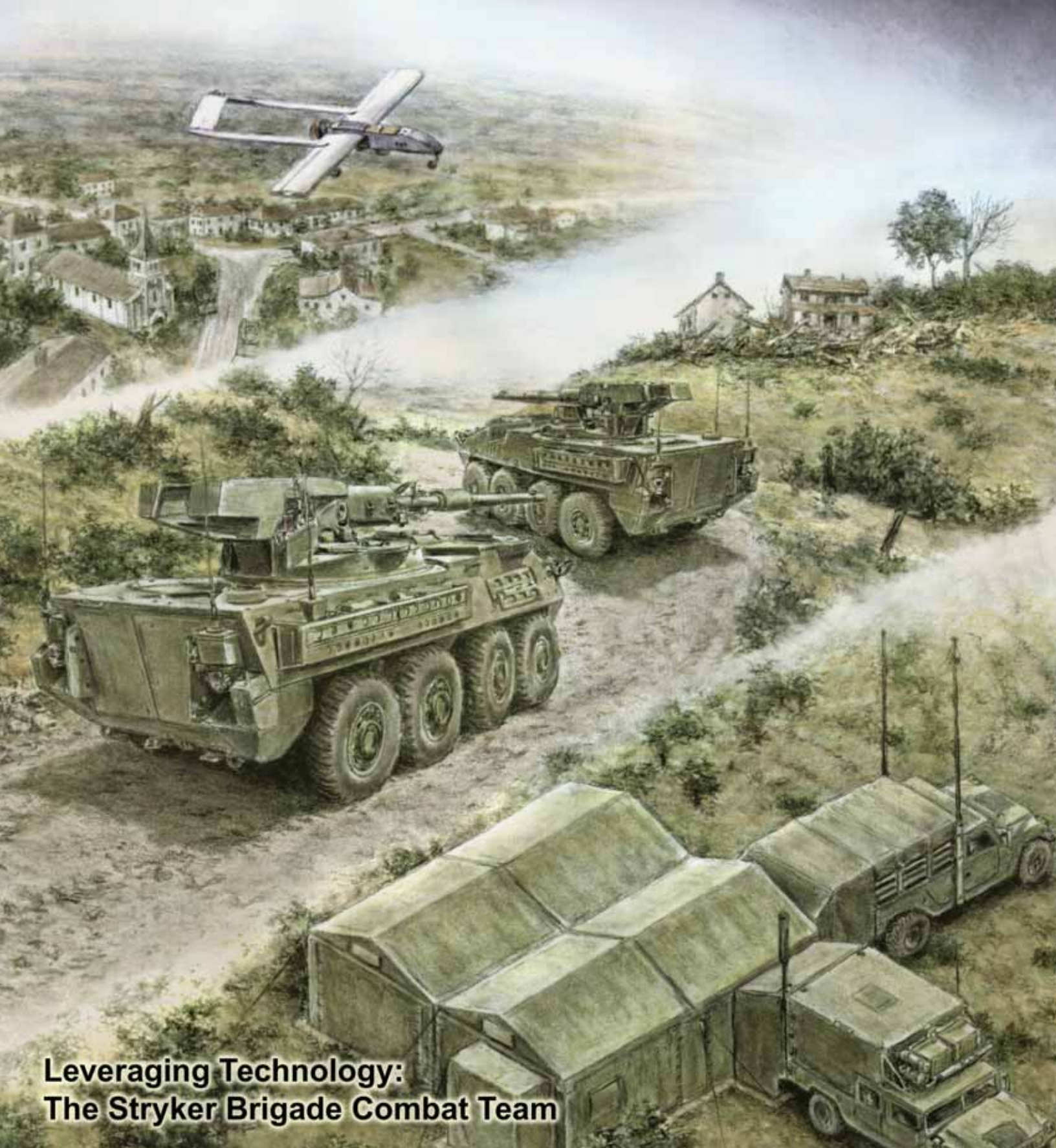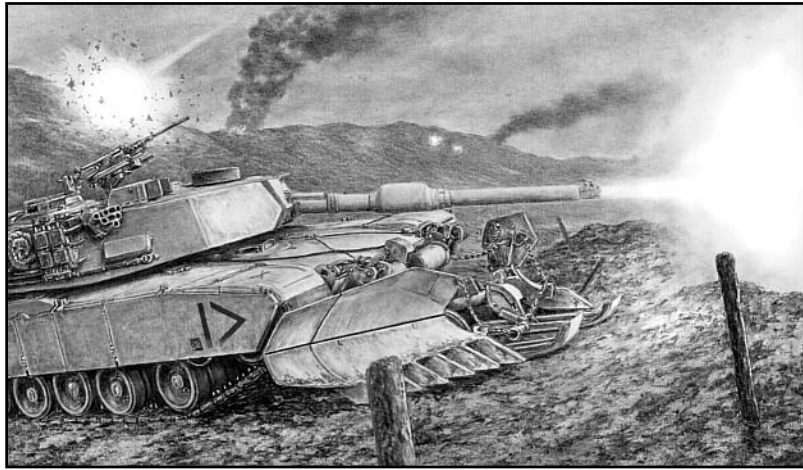# ARMOR

January-February 2003

Leveraging Technology:
The Stryker Brigade Combat Team

Once More Unto the Breach

Thoughts on the Edge of the Breach: It's hard to believe, but yet another year has passed. I rang in 2002 with a few friends in the Republic of Korea. This year, I will ring in 2003 with friends and family at Fort Knox. Many of you will spend this New Year away from family and friends in isolated desert encampments or frozen hillsides defending freedom's frontier. My best wishes to you.

A year can make a huge difference! This time last year, the fight to rid al-Qaeda and the Taliban from Afghanistan was near completion, the Crusader artillery system was on the verge of deployment, and the choice for the Army's new weapons system for the interim brigade combat team (IBCT) remained undecided.

In the year 2003, Afghanistan will be ruled by an elected government with support from coalition forces and the United States, the Crusader has been cancelled, and the new Stryker-equipped IBCT's are being deployed. I wonder what lies in store for us in 2003. I am sure whatever it is, the Armored force will be a part of any national strategic strategy.

In an effort to keep evolving and transcending toward the future, *ARMOR* is exploring and implementing ideas to keep pace with the Army's Transformation efforts. Many of the Army's professional journals have ceased publication and more are fading away. *ARMOR*'s staff understands the 112-year history of the magazine and is determined to build on its legacy. New software enables us to expand *ARMOR*'s horizons and offer our readers a more appealing and easier-to-read journal. Better paper, more color (when I can afford it), innovative layouts and designs, and great authors will keep *ARMOR* on the leading edge of professional publications.

What we will not change are the issues and concerns that affect the Armor branch. Whether its advocating changes in doctrine, tactics, and equipment or discussions on the future of the Armor force, this journal will be at the forefront in challenging professional discourse. Armor branch and, more importantly, the Army value your intrinsic contributions as readers and authors. *ARMOR* will continue to be the forum where thoughtful, professional, and compassionate debate can occur. There is no room in today's uncertain environment for stifling ideas; too much is on the line.

In recent months, we have received some excellent and relevant articles. In this issue, Major Michael Kasales and CW2 Matthew Gray write an excellent article on ISR operations to facilitate early entry operations by the Stryker Brigade Combat Team (SBCT). Their article presents an interesting look at how the SBCT is implementing new digital technology to become more successful during the ISR process and ultimately during combat operations. Kasales and Gray also provide helpful tips on how a battalion staff can maintain digital skill proficiency — a skill that is as perishable as a tank platoon maneuvering through a defile.

Speaking of defiles: ever wonder how to get your force through a restrictive mountain pass? Captain Mike Sullivan provides some answers. Many of you heroes have had the opportunity to pass through Regulator Valley at the Combat Maneuver Training Center at Hohenfels. I have, and it wasn't a pretty sight for my tank company. I recall that during one opportunity to excel, my company was pretty much "MILES" decapitated. Sullivan draws on his experience as an observer controller to enlighten us on how to successfully maneuver a force through a defile. Many of his lessons are applicable to urban terrain as well; techniques that some of our forces might be called on to use in the near future.

The Battle for Rorke's Drift happened 124 years ago in January 1879. This battle, pitting the British against the native Zulus, has been thoroughly analyzed throughout the years. Captain Arch Ratliff III, USMC, takes a different and innovative route in describing this action. I think you will enjoy his creative flair in examining the lessons learned and outcome of this battle.
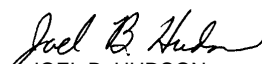
Time is getting short. Please keep the flow of articles and letters coming. I wish everyone peace and prosperity for the New Year.

– DRM

ARMOR

The Professional Development Bulletin of the Armor Branch PB 17-03-1

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LETTERS

Transformation From a Mobile Gun System Soldier's Point of View

Dear Sir:

I am a sergeant and a tanker in the greatest Army in the world. I enlisted in 1999 as a buck private, and knew I had to become a gunner on the M1A1. It's all I wanted from my first enlistment, and I worked my tail off to get it. A year and a half later, I was pulling triggers on my first TT VIII. Within 2½ years, I was proudly wearing my sergeant stripes. I was at the top of my game. I loved my job.

All things must change, however, and my tank was taken away only to be replaced by a tin can with a gun strapped to the top. I was relegated to an infantry unit to do a job I didn't sign up to do. Unlike my infantry brethren, I was now useless. My sentiments at the time were largely based on my fear of change. Would I stack up to my peers in an infantry company? Would I become a permanent detail donkey? How was I to fight without my 30 tons of frontal armor to protect me? How would a commander in an infantry company know what to do with us? It seemed as if some big shot in an office somewhere had it out for 19 kilos. The truth was, I had forgotten the necessity for growth and change. If we stop learning new skills, we are dead as an effective fighting force.

The Army is very similar to the human body in that it has to be stressed beyond its current level to achieve better performance. If it stagnates, it loses its ability to operate, and gradually wastes away. Our enemies are getting more technologically advanced every day and, likewise, we must change to stay one step ahead of our competitors. In spite of all the current setbacks to the Transformation program, generally, and Stryker vehicle specifically, I truly believe the Stryker Brigade Combat Team concept to be sound. Historically, the fighting force that moves the fastest on strategic objectives with the least logistical collateral wins.

My fears about integration into the infantry have largely been quelled. This is due entirely to the professionalism, competency, and compassion of the officers and noncommissioned officers of the Gimlet Battalion. Although the unit is still struggling with the vehicle issues, I believe this time has allowed us as a unit to learn lost skills and open our collective minds about the advantages of combining resources and knowledge. I am more mentally and physically fit as a result of our training content and tempo.

All is not wine and roses, however. The question persists about the new vehicle. The word around the campfire is that we might not get the Stryker at all now. With a lack of tangible answers at my level, speculation is running rampant. Soldiers are beginning to feel lost in the mill. This leads to other problems as well. Because doctrine and SOP are being written as we progress, not having the equipment on hand is inevitably giving in to misconceptions, which could jeopardize future success. We are in danger of having to start the process all over again when the final product arrives. We must have the vehicle in hand to know its potential when it gets out in the real world. Also, as a tanker, my career bread and butter has been performing during gunneries. Without that, many of us will feel the pinch when awards are handed out. Opportunities to distinguish one's self is severely diminished. Our morale is slowly failing as a result. We tend to question our value when we are not actively engaged in our field. Tankers tend to draw a great deal of pride from their daily work. It becomes very difficult to find pride in being a busy-worker. As an example, our average workday is complete by 1400 hours. Between 1400 and 1700, we are forced to search for things to occupy time. The faster the new vehicles arrive — the better — even if they aren't a permanent addition to our unit. My skills, motivation, and potential are all wasted when I sit idle. Likewise, not having the necessary equipment on hand to adequately train in the combined arms environment has limited most infantry soldiers' understanding of the value of a 105mm armored, direct fire weapons system on call for support at a moment's notice. This type of system is a true force multiplier that should be used routinely.

The Stryker MGS is a difficult issue to address. As a tanker, I truly feel it was the wrong choice for this role. With continuing performance, armor, and contract issues delaying its arrival, I question how it remains a viable option. I believe the rush to find a "do everything" vehicle has forced us to compromise the specific needs of the role this equipment has to fill. As a soldier, I will, out of necessity, learn to use all aspects of whatever vehicle the Army gives me to its full potential. To do less would reduce my own survivability.

My outlook on the IBCT concept is that it will eventually become a great success. With a little tweaking along the way, this method of warfighting could become tomorrow's norm. One modification to the current program would be adding a 4th vehicle to the MGS platoons. The IAV is not a stand-alone vehicle, so having a 3-vehicle platoon forces one element to fight without support, which, in turn, leaves that crew exposed. The platoon's survival depends on massing fires. There is no more toe-to-toe fighting, like there is with tanks. Another adjustment is the training of replacement of soldiers to MGS roles. We need fresh troops to replace the losses that we are already incurring or to give bonuses to existing troops in an effort to stabilize them in their current positions. This current level of loss cannot be sustained, and is very costly in terms of wasted training. Finally, the possible creation of a new MOS could solve many of the identity issues already addressed. Who we are is largely based on the job we do.

I truly look forward to seeing the growth of the next generation of soldiers. I am proud to be a part of this dynamic chapter in our Army's history. As a NCO, I could not be more delighted to be helping train the force of tomorrow.

ROBERT C. DALAGER
SGT, USA
MGS Gunner

Reactivating 3-73 Armor Could Bridge MOUT Gap

Dear Sir:

The Chief of Armor's report in the September-October 2002 issue of *ARMOR* Magazine should be welcome news to all proponents of armor in the light forces — still a subset of all tread heads, to be sure. Accepting the Stryker Mobile Gun System (MGS) on behalf of the Army, Major General Whitcomb correctly highlights the much-needed capability that the MGS provides brigade combat teams now being organized and trained. For many of us aging observers, the MGS acceptance ceremony also signifies the return of armor to the light forces — partially correcting past errors in developing such a weapons system, and the disastrous 1997 decision to deactivate 3-73 Armor on the eve of contingency operations in Bosnia and Afghanistan.

The MGS, in my opinion, will prove to be the critical element in the future success of the interim brigade combat teams, especially in urban environments. Although not well understood by the casual observer of military operations (or even some Cold War tankers that have not worked with light infantry), the mobile protected firepower of the MGS is often the determining factor in military operations on urban terrain (MOUT) mission success. The infantry "stacks of four" ballet is a wonder to behold and quite necessary in some situations, but a well-trained armor-infantry team is the key to victory in future fights. As seen in Palestine and at the few U.S. Army MOUT sites that train armor-infantry units to standard, proficient armor-infantry-engineer combined arms teams can achieve mission success on schedule and without the unacceptably high attacking force casualties that often result from these operations.

However, the good news of the accelerated Stryker MGS rollout is tempered by the bad news — fielding this capability to bri-

gade combat teams after September 2004 will miss most of the fights that loom on the horizon. Also, the light/airborne/air assault units most likely to be deployed for these difficult missions have no organic armor with which to train or fight. They must be content with the odd Joint Readiness Training Center rotation and on-the-job training (Mogadishu). A temporary and perhaps visionary solution is to reactivate 3-73 Armor as a MOUT battle force for the 18th Corps. A company of Sheridan's at Fort Bragg, Fort Campbell, and Fort Drum can provide deployable platoons for battalion-combined arms MOUT training and operations very quickly after reactivation. The core cadre for these units still exists. MOUT authors from *ARMOR*'s September-October 2002 issue, Sergeants First Class Wyatt and Barcinas, are shining examples. Vehicles, spare parts, and ammunition were quite plentiful in 1997 — all qualified for U.S. Air Force transport. The Sheridan, much maligned in its early, before-its-time career is a very good urban platform — exceptional strategic and tactical mobility, short 152mm gun tube for narrow streets, good crew protection, and a multipurpose conventional round that eats buildings — ask veterans of Panama City.

Why is this option visionary? It solves a major short-term combat deficiency and prepares for a rapid transformation to the Objective Force in two ways. The organization, doctrine, and people will exist to receive Future Combat Systems in the contingency corps and the unique gun-missile launcher technology may get another look — just when it may be needed to make the Chief's vision a reality. It doesn't get any better than that!

FRANK HARTLINE
COL, Ret.
Tucson, AZ

Conscripted vs. Volunteer Force

Dear Sir:

I am sure there will be other retorts to Captain Brian W. Brennan's article, "Limited vs. Total War," in your September-October 2002 issue. I am inclined to the view that the two World Wars are atypical, but the massive carnage has profoundly influenced global psyche so that we see wars pursued for limited objectives and with limited means as failures. And this isn't necessarily so! However, I would like to limit myself to a few comments about conscription.

First, European countries that maintain conscription do so as much for social as military necessity, and most European countries are phasing out conscription. The United States' all-volunteer military should be seen as a remarkable achievement. It has provided a large, well-motivated, adaptable, and high-quality armed force. The Red army of the Cold War era may have had an advantage in Central Europe, but it was not overwhelming and could not match the United States' ability to deploy large expeditionary forces such as those to South West Asia in 1990.

Moreover, there is little historical support that volunteers perform any differently than conscripts. All soldiers do better when they believe in what they are doing. There are certainly social costs to conscription when societies are not unified as typified by the New York draft riots during the U.S. Civil War and the anticonscription campaign in Australia during the Great War.

An equally crucial issue is the availability of technicians, medical personnel, and other specialists. Having a healthy, well-educated, and cohesive society from which to draw such personnel is vital. This is where the United States has a comparative advantage. As a simple comparison, the United States trains more aircrew per capita than any other country — at least two-and-one-half times greater than that of Australia. The United States' preponderance is the same in most other specialist military skills.

I have little doubt that the United States will continue to lead the way in how to provide a steadfast and capable future military. This has a lot to do with the ability to reflect and change to new circumstances, if writings in *ARMOR* are anything to go by.

RUSSELL MILES
Victoria, Australia

The Brigade Deep CASEVAC Plan

Dear Sir:

I read with enthusiasm the article by CPT David Meyer in the September-October 2002 issue of *ARMOR*. An article on the often-overlooked aspect of CASEVAC is always welcomed and I appreciate his insights on the challenge of "connectivity and access."

I have one question about the platoon sergeant's (PSG) role in the CASEVAC procedure. How does he transport a casualty, or casualties, which is more often the case, in his M1026?

Though I have no experience in a brigade reconnaissance team (BRT), I do have 3 years of experience as an M1026 equipped PSG in the 2d ACR. I found that I could not realistically transport a casualty in my M1026, and I am assuming the BRT PSG would face the same problem.

Nearly every available inch of cargo area in my truck was covered with something. My crew seats contained rucksacks, my cargo area was full of basic issue items and MREs, my back hatch held a spare tire, my tailgate had fuel cans and a tow bar, my hood was covered with concertina wire, and my brush guard carried pickets. All available floor space in the front of the HMMWV was taken up with additional gear and, of course, my gunner also needed a place to put his feet. If I had a few cubic feet of floor space available, I carried notional mortar rounds. In real life, that space would have contained boxes of MK19 ammunition.

Is it time to adopt a different model of HMMWV for the scout platoon sergeant? Would an M1035 or M1038 be a more reasonable choice? It would certainly facilitate CASEVAC and also enable the platoon to move forward with additional class I, III, and V munitions.

JASON A. HASTINGS
Camp Doha, Kuwait

Training for the Commander's Intent

Dear Sir:

It is often stated that the minimum we need for tactical success is the mission statement and the commander's intent. When the enemy does not cooperate with our plans and the fog of battle has set in, it is vital that leaders use these two pieces of information to accomplish the task. Leaders who can react quickly and decisively to rapidly changing situations are crucial to our organization. Those who are only capable of inflexibly following the plan will often find themselves on the losing side. This concept was reinforced this summer as I watched sophomore cadets at the U.S. Military Academy conduct maneuver training. Those squads and platoons that possessed leaders with initiative and an understanding of the commander's intent succeeded while others failed. In my experience, company-level and below training emphasizes execution of the plan. This is a deficiency that should be remedied, if possible. I propose a guide for planning this type of tactical training.

An example of 'plan-oriented' training is the platoon lane training that my mechanized infantry battalion conducted in Germany. This training consisted of three platoon lanes, each with a different mission focus. The lanes consisted of a platoon defense of a battle position, a platoon hasty defense, and a platoon attack. Do not misunderstand me; the training provided some excellent lessons and a rare opportunity to maneuver the platoon. However, the training failed to test leaders' ability to react to the unexpected. In all scenarios, the intelligence on the enemy was flawless and the enemy performed exactly as expected. The only requirement was for leaders to execute the plan to standard. Certainly this was enough of a challenge for some depending on the level of experience involved. However, we can and need to do better.

Training should be conducted to emphasize execution of the commander's intent. The way to do this requires only a slight modification to our current lane training doctrine. Leaders and units can receive a mission, conduct troop-leading procedures,

COMMANDER'S HATCH

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

Reducing Abrams Tank Fires Starts with Training and Leadership

The frequency of tank fires has increased in the past several years, and more significantly, three tankers died during training as a result of tank fires in 2002. It's time again for Armor Force leaders to ensure we are doing all we can to prevent tank fires. The solution to this problem must be a team effort of leader and soldier action combined with materiel fixes. Our partnership between the Armor Force, the Armor Center, the Program Manager for Abrams tanks, and the U.S. Army Safety Center will ensure tank crews have confidence in the safety and reliability of the best tank in the world.

As I have said before, the Abrams tank is an equal opportunity killer. While it has proven combat lethality, the Abrams has claimed the lives of 26 Armor crewmen in fatal accidents between 1982 and 2002. While there are hundreds of potential reasons for tank fires, which have substantially damaged the tanks, only two types of tank fires kill tankers — ammunition fires and nuclear, biological, and chemical (NBC) filter fires. Five tankers have died in ammunition fires and two tank drivers have died in NBC filter fires.

We all know our training is tough and performed under realistic conditions, but one soldier's life lost to a tank fire is too many, especially when most accidents can be prevented. I want to review what our responsibilities are as leaders and as tank crews to drop this fatality statistic down to zero.

The two most important things that can be done to prevent tank fires is preventative maintenance and training.

Units must use tank technical manuals to conduct any and all maintenance. They must adhere to their PMCS inspections and their nonmission capable criteria. Training will help prevent ammunition fires, which includes ammunition fire hazard awareness, ammunition inspection, handling, and storage, and proper main gun loading, clearing, and misfire procedures. Training that will help prevent NBC filter fires is NBC system operation and fire hazard awareness, PMCS checks of the NBC main system, correct operation of the NBC main system, and proper servicing of the NBC system.

The Armor Center remains engaged, with the TRADOC System Manager (TSM) Abrams as our lead. TSM Abrams is continually updating armor technical manuals and serves as a user representative with the Abrams Program Manager (PM). I have also tasked the Armor School Command Sergeant Major, James Dale, to work with TSM Abrams, 16th Cavalry Regiment, and Abrams PM to develop and document a single standard crew fire evacuation drill that enforces a time standard. This drill performed to standard will help ensure the survival of tankers when fires do occur. We distributed a compact disk (CD) titled, "Abrams Crew Emergency Evacuation Procedures," to the force during October 2002 — look for it. If a fire does occur in your tank, the safe evacuation of your entire crew is first mission — then worry about shutting down the tank engine and extinguishing the fire. Tank crews must rehearse this drill regularly. Commanders and master gunners must integrate this crew evac-

uation drill into all gunnery and maneuver training. I feel so strongly about this that I have already decided to make crew evacuation a testable crew task in the Tank Crew Gunnery Skills Test.

Another risk-reduction measure that Armor leaders and crews must perform to standard is properly wearing complete NOMEX personal protective equipment. Failure to enforce wearing gloves, body armor, and the balaclava were contributing factors that increased the severity of injuries and even the death of soldiers involved in Abrams fires. We owe it to our soldiers to enforce these uniform standards. It is a measure we can control to reduce the risk, or at least minimize the severity, of injury during tank fires.

The Armor Center shares this burden with you. We are developing systems and techniques, including materiel fixes, in concert with Abrams PM that will help lower the incidence of M1 tank fires and reduce risk to crews. We are adding an audible alarm to alert the full crew of NBC main system failure to the M1A1 through a modification work order. All Abrams tanks will be equipped with an automatic shutoff capability that will activate and turn off the NBC main system 2 minutes after warnings are triggered and before a filter fire can occur. We are also modifying the mounting system for the driver night vision viewer to allow rapid egress out through the driver's hatch. Stainless steel hardware is the new standard for bolts that retain many of the NBC system components that are subject to corrosion. New air

CSM William J. Gainey
Command Sergeant Major
U.S. Army Armor Center

Mounted Soldier Modernization —

Building the Future Combat Soldier

As the U.S. Army transforms, one thing is for certain — soldiers and soldiering remain our primary focus. The U.S. Army Armor Center is committed to the American soldier. Soldiers are our most important assets. An American soldier, on the ground, is the most visible symbol of American determination and will. Committing America's Army makes a strong statement that adversaries cannot misinterpret. The Army makes the most significant investment it can make to the nation's security by properly training, equipping, and supporting its soldiers.

The U.S. Army Training and Doctrine Command System Manager (TSM)-Soldier is charged with responsibility for managing the Soldier Enhancement Program (SEP) for the Army. Focused on "the Soldier is the weapon," TSM-Soldier has user management responsibility and represents all soldiers in the field. The SEP's goal is to improve the lethality, survivability, command and control, mobility, and sustainability for all soldiers. This high-performing organization will keep Fort Knox on the cutting edge of the future combat soldier programs. I asked Assistant TRADOC System Manager-Soldier to update the Armored Force on recent progress in individual soldier development.

———————

Advancements in technology will change 21st century warfare. Soldiers — America's ultimate weapon — will continue to close with and destroy the enemy, but emerging technologies will yield new combat capabilities. In fact, technological advances promise to enhance the combat crewman's fighting capabilities, to include lethality and dispersion, volume and precision of fire, integrative technology, mass and effects, and invisibility, and delectability.

U.S. interests abroad seem to shift and expand, but never diminish. A vast array of regional threats and challenges to U.S. interests are ever present. The U.S. Army must be capable of anticipating and responding to future challenges. Future battlefields will be characterized by systems of increasing lethality and technological capabilities, such as direct-fire weapons, laser and radio frequency weapons, electronic and information warfare, low observable technologies, and weapons of mass destruction.

Today's Army is fully prepared to serve the Nation and stands ready to fulfill all missions required in the current operational environment. However, the changing nature of that operational environment and the potential for dramatic advances through new technologies present the need and opportunity to transform the U.S. Army and its mounted soldiers into an even more responsive and effective force. Balancing risk with the necessity of readiness, new operational requirements, homeland security, and Army Transformation ensures that soldier modernization will remain an overriding imperative for the future.

Key to the Army's Transformation efforts will be our ability to modernize the mounted soldier. Harnessing the power of advanced technologies, especially information technology to achieve situational dominance and decision-making momentum will create a new construct for the application of force. Mounted Warrior modernization along with the evolution of Future Combat Systems and the Unit of Action will provide the Army a force that is dominant at every point on the spectrum of conflict.

The Mounted Warrior Soldier System (MWSS) will leverage the best of capabilities that are evolving in other Warrior Programs, such as Land Warrior and Air Warrior, eventually maturing to an Objective Force Soldier System capability. Technological advancements will allow the fighting vehicle crewmen to close with the enemy by means of fire and maneuver to destroy, capture, or to repel his assault while the combat support and combat service support vehicle crewmen are better connected to the situation and better prepared to maximize the capabilities of their vehicles and their support function.

The MWSS will be developed and fielded in three blocks using a modernization strategy that conforms to the Army Transformation plan. Designated block improvements will transition the mounted crewmen from Current Forces (2002-2005) to a Stryker Variant (2005-2008), and ultimately to Objective Force (2008 and beyond). Evolutionary development of each block provides an operationally usable increment of capability. Each successive block incorporates newer and better technologies as they become available.

Leveraging Technology: The Stryker Brigade Combat Team

by Major Michael C. Kasales and CW2 Matthew E. Gray

"Thus we may know that there are five essentials for victory: he will win who knows when to fight and when not to fight; he will win who knows how to handle both superior and inferior forces; he will win whose army is animated by the same spirit throughout all its ranks; he will win who, prepared himself, waits to take the enemy unprepared; he will win who has military capacity and is not interfered with by the sovereign."

— Sun Tzu

As the Joint Task Force (JTF) conducts military operations against RED military forces in the western portion of the JTF's area of responsibility, sub-JTF Striker conducts ground combat operations to the east to isolate and destroy RED's weapons of mass effects (WME) capabilities. Marine Forces conduct a demonstration and limited beachhead operations along the coast to fix and deceive RED forces. Airborne infantry units from the Army Forces (ARFOR) conduct parachute assaults to seize key terrain and isolate WME to prevent RED counterattacks. Task Force Ranger conducts a parachute assault to destroy RED forces and seize an airfield to facilitate early entry operations by the Stryker Brigade Combat Team (SBCT). The SBCT's mission is to conduct simultaneous offensive operations to destroy threat command and control, force projection, and WME capabilities that threaten the region to facilitate JTF military operations against country RED and prevent the use of WME in the JTF's area of responsibility (AOR).

The SBCT begins early entry operations within hours of the successful airfield seizure executed by elements of the 75th Ranger Regiment. Having conducted collaborative contingency planning for this operation with the ARFOR prior to departure from CONUS, the SBCT quickly marshals within the airhead and prepares to execute simultaneous offensive operations. Appropriate force packages were deployed to allow the brigade to rapidly augment the security of the airhead, as well as begin execution of intelligence, surveillance, and reconnaissance (ISR) operations to facilitate future offensive actions. Command posts are quickly established and all elements within the SBCT begin refining plans and battle tracking using the upper and lower tactical internet provided by the Army Battle Command System (ABCS) and Force XXI Battle Command Brigade and Below (FBCB2).

As the brigade continues to build combat power at the airhead, the reconnaissance squadron executes ISR operations to answer the commander's priority intelligence requirements (PIR), support the refinement of the plan for offensive operations, facilitate the SBCT's situational understanding, and shape (enable) SBCT operations. The squadron conducts continuous, collaborative, planning and battle command as robust ISR capabilities of the squadron are employed. The squadron commander and staff keep constant communications with the SBCT command group and tactical operations center (TOC) using a wide variety of communications assets such as traditional FM radios, the tactical internet, satellite communications, high-frequency radios, and Trojan Spirit. Additionally, as squadron assets begin devel-

oping situational awareness, the squadron tactical command post (TAC) and TOC verify communications with other SBCT and adjacent units to facilitate rapid link-up operations and battle/target handover at the objective areas.

As combat information is forwarded to the SBCT TOC, the brigade S2 and squadron staff develop processed intelligence using organic resources and reach capability. Upon receiving sufficient information to support the commander's decision points, the SBCT begins combat operations with three Stryker infantry battalions conducting simultaneous offensive operations against three separate objectives. During the conduct of these offensive operations, the reconnaissance squadron continues to report combat information to the brigade and battalion commanders and staffs, "pulling" them along the "path of least resistance," thus enabling the successful execution of SBCT combat operations.

As the Army's first SBCT executes the final phases of transformation and prepares for its interim operational capable training rotation at the Joint Readiness Training Center, several lessons have been learned about ISR operations, digital battle command, and how ABCS and FBCB2 facilitate ISR operations planning and execution.

ISR Planning Timeline

The key to successful ISR operations is the early development of the ISR plan. By developing this plan early, reconnaissance forces can be employed with sufficient time to gather information, increase situational understanding, provide input to the SBCT's planning process, and develop the situation prior to the application of combat power — all of which enable the SBCT to successfully accomplish its mission.

There are several key points in developing the ISR plan: the SBCT and squadron staffs must begin developing the ISR plan upon receipt of warning order (WARNO) 1 from the ARFOR; both the SBCT and squadron staffs must receive ARFOR planning products early in the planning process, or

access information from theater- or national-level sources; and the squadron staff must remain aware of changes to commander's guidance or changing mission requirements to refine the current ISR operation in progress.

To facilitate the early development of the SBCT's ISR plan, it is essential to be linked to the brigade's higher headquarters. Ideally, this linkage will be through a digital network, allowing the brigade and squadron staffs the ability to access ARFOR websites. A successful tactics, techniques, and procedures (TTP) practiced during a recent command post exercise had the ARFOR homepage continuously displayed in the squadron combat information center (CIC) on a large screen display (LSD). When TOCs are established during tactical operations, information can be accessed through the upper TI. During contingency planning at home station (or when upper TI connectivity is limited) this information can be accessed through the secret internet protocol router network (SIPRNET) using the Trojan Spirit [Special Purpose Integrated Remote Intelligence Terminal].

ISR planning must begin as soon as the ARFOR publishes WARNO 1. This order provides the squadron and brigade staffs with the basic mission elements. Preliminary planning, specifically the conduct of detailed intelligence preparation of the battlefield, must be accomplished prior to receiving ARFOR WARNO 1. After receiving WARNO 1 and commander's guidance for ISR execution, the squadron staff can begin the military decisionmaking process (MDMP). ARFOR WARNO 2 (and reach capability to theater or national agencies) provides the detailed information on threat forces required to complete ISR planning. The squadron staff takes the lead on ISR planning and, through close coordination with the brigade staff, adds the requisite level of detail for execution.

The squadron should attempt to complete its planning for ISR operations prior to the SBCT's mission analysis (MA) brief. A key point to remember is that the SBCT staff has been actively involved in the squadron's planning process from the beginning. At the brigade's MA brief, the squadron commander or operations officer briefs the concept of ISR operations to the SBCT commander and staff. Following the MA brief, the SBCT commander issues his commander's guidance for the brigade's operations. It is essential that the commander give the brigade staff and squadron commander guidance specific to the ISR operation. At this point, the squadron has already conducted at least one course of action (COA) brief with the SBCT command group and key staff.

On final approval of the ISR plan by the SBCT commander, the squadron begins operations focused on answering the commander's initial PIR. This phase of the ISR operation is known as reconnaissance push — collecting information to support the higher organization's planning process. Information is continuously fed to the brigade staff as they conduct
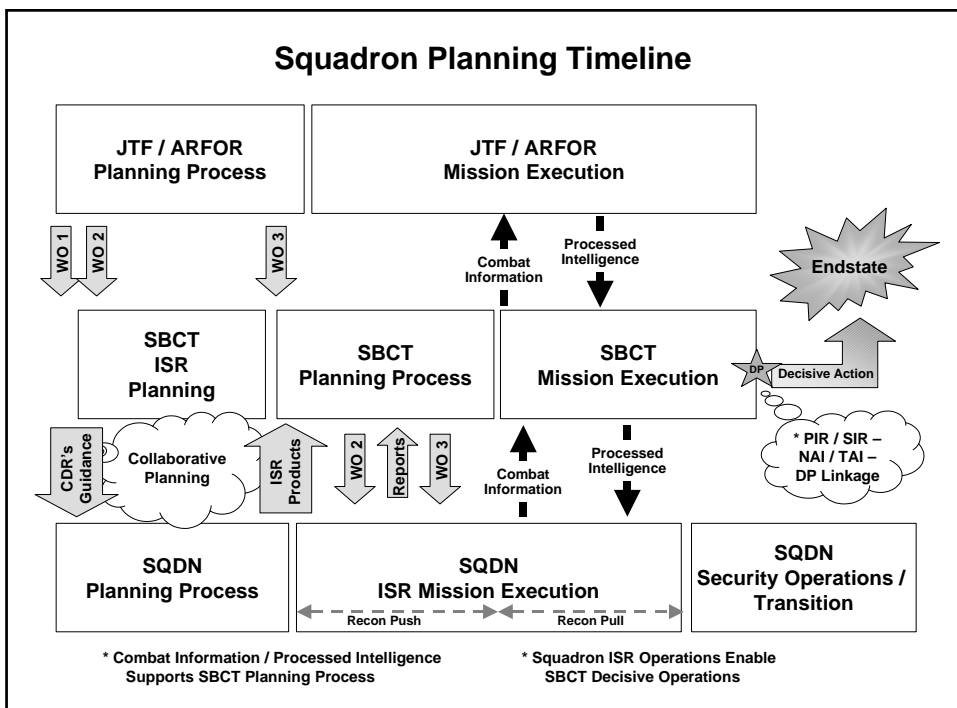

Figure 1. ISR Planning Timeline

planning for the SBCT's mission. The combat information and processed intelligence that results from the initial ISR operation allows the brigade staff to plan for the employment of the SBCT based on "hard" intelligence and reduces the number of planning assumptions. If the brigade staff needs additional information during the planning process, a fragmentary order is sent to the squadron detailing the specific information requirements. The squadron staff then refines the ISR plan and directs the appropriate asset to collect the requested information.

Once the brigade staff completes the planning process, the employment methodology of the squadron changes to reconnaissance pull — providing information (and possibly conducting shaping operations) on threat forces to allow SBCT elements to maneuver out of contact and gain positional advantage over the enemy to strike at the time and place determined by the SBCT commander. Once SBCT elements commit to decisive action, the squadron transitions to support follow-on missions having already completed planning based on ARFOR WARNOs or brigade-determined requirements for future operations.

ISR Planning Process

Legacy doctrine and TTP used to describe the development of brigade collection and battalion reconnaissance and surveillance plans is not sufficient, nor efficient enough to facilitate ISR planning in an SBCT. It can be argued that previous techniques have never facilitated reconnaissance operations. This has been demonstrated by the number one reoccurring trend identified by the combat training centers — failures in reconnaissance and surveillance operations.

The SBCT is the first organization that has an entire battalion-sized subordinate unit (with a full staff organization) responsible for ISR operations, therefore, SBCT staff does not have to be burdened with the responsibility to develop the ISR plan — the squadron staff accomplishes this task in close coordination with the SBCT staff. This allows the brigade staff to focus on overall SBCT operations, and reduces the amount of redundant work in developing the ISR plan. However, it is imperative that the two staffs have a clear understanding of responsibilities for providing resources, support requirements, development of technical details to support the operation, and synchronization of the operation.

As mission requirements are identified, the two staffs must coordinate and synchronize combat multipliers and support requirements. ABCS allows for rapid dissemination of planning products, and the various communications assets allow for direct communications between staff officers. Each staff section must identify and have a mutual understanding of what planning products must be produced, who has responsibility for each product (or portion of), when these products will be available, and where (in the ABCS architecture) they will be posted. The charts at right list the types of information that must be coordinated between the brigade and squadron staff during specific steps

Mission Analysis	Produced by SBCT	Produced by Squadron
INT	Initial Enemy Situation Template Event Template / Matrix Enemy Order of Battle General Terrain Products EAB Reconnaissance Schedule EAB HUMINT Assets in AOR EAB NAI Coverage Requirements Information Requirements Brigade MDMP Timeline	Squadron ISR Asset Status Squadron ISR Plan (Concept) RFIs on Threat Forces Terrain Product Requests
MAN	Air-Land Flow Initial Commander's ISR Guidance Commander's CCIR Assets Available to Support ISR	Initial ISR Concept ISR Operation Support Requirements A2C2 Overlay / TUAV Schedule Tactical Risk Assessment
EFFECTS	Cdr's Intent for Fire and Effects Available Fire and Effects Assets	Proposed Squadron EFETs Critical RFIs
CSS	Initial Location of BSA Initial Concept of Support Location of IN BNs for Area Support	Initial CTCP Location Initial Support Requirements Initial Concept of Support Sketch
C2	Location of NCS-E Location of 334th TREX Location of IN BN TREX Voice NET Plan and Checks	Initial TOC and TAC locations Initial TREX locations Initial TREX NETs to be RETRANS C2 Overlay

Chart 1. Mission Analysis Requirements for ISR Planning

COA Development	Produced by SBCT	Produced by Squadron
INT	Brigade Commander's ISR Guidance Brigade Collection Plan (Draft) (Non-RSTA Coverage Requirements) (Proposed RSTA Requirements)	Sensor locations and focus -- LP/OP Locations, Patrol Routes -- UAV ROZ -- Prophet Baseline -- REMBASS/GSR Locations Squadron NAI Overlay Coverage of Plan for NAIs
MAN	Refined Commander's ISR Guidance Time for Available Combat Multipliers Graphic Control Measures	Refined ISR Concept Scheme of Maneuver / Overlay Combat Multiplier Integration
EFFECTS	Refinement of Target List Brigade EFETs	Draft Target List Approved Squadron EFETs Suggested FSCMs Draft Concept of Fires
CSS	Changes to Area Support Plan Changes Concept of Support	Refined CTCP location Refined CSS Overlay Refined CSS Concept of Support
C2	Changes to C2 Node Locations Changes to Voice NET PLAN	Verified TOC/TAC locations Verified TREX Locations Overlay Verified TREX NETs Changes to C2 Overlay

Chart 2. COA Development Requirements for ISR Planning

Wargaming	Produced by SBCT	Produced by Squadron
INT	Updates to EAB Collection Plan Responses to RFIs Terrain Product Requests Updates to Brigade SITTEMP Updates to COA Overlays	Squadron ISR Plan Final Squadron NAI Overlay Sensor Coverage Overlay ID Gaps in Higher Collection Plan
MAN	Approval of ISR COA Confirm Support Requests	Squadron Synchronization Matrix
EFFECTS	Changes to Brigade EFETs Changes to Brigade Target List Changes to Available Assets FSCMs / AGM / TSS / HPTL	Final Target List Fire and Effects Execution Matrix Complete Squadron Annex D
CSS	Final Concept of Support CSS Overlay	Paragraph 4 and Annex I Final CSS Overlay
C2	Changes to Brigade C2 Node locations Changes to Voice NET Plan	Changes to C2 Locations Changes to TREX Locations Changes to NET RETRANS Plan Changes to C2 Overlay

Chart 3. Wargaming Requirements for ISR Planning
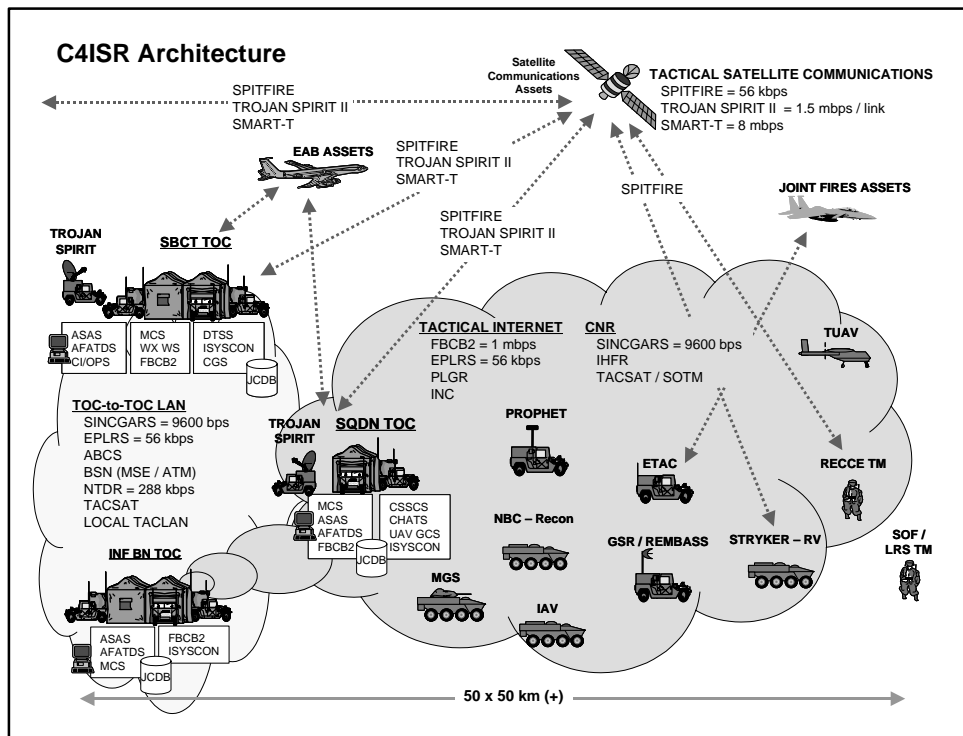
C4ISR Architecture

Figure 2. C4ISR Architecture

of the MDMP. This information is coordinated through a combination of voice and digital communications. It is essential that all staff members know the exact location of this information and when it will posted on the respective staff's website. Additionally, each staff member must have a detailed listing of ABCS internet protocol (IP) addresses to ensure timely and accurate messaging between staff sections.

After the SBCT's higher headquarters issues WARNO 1, the squadron has a general understanding of upcoming mission requirements. The information available in this WARNO allows the squadron to begin its MDMP. However, this requires ISR planning guidance from the SBCT commander to continue planning. A useful tool to gain this guidance is an ISR concept worksheet. A sample ISR concept worksheet is available at *www.knox.army.mil/armormag/* under the "Downloads" link.

Based on the general understanding of the brigade's mission, the squadron staff completes the ISR concept worksheet. The worksheet provides a basic concept and courses of action for the employment of squadron assets to enable the SBCT for its upcoming mission. Because this worksheet is developed prior to the brigade or squadron beginning the formal MDMP, it only provides a framework for the SBCT commander to give guidance. This process does not take the place of COA development, which occurs later in the squadron's planning process. The worksheet does outline all possible employment considerations given the SBCT's current location, the objective area, and an initial analysis of terrain and threat forces. From this, the brigade commander can provide specific guidance for the conduct of the ISR operation.

As mentioned earlier, it is imperative that the squadron receives detailed information on terrain and the threat situation. This information should be gained once the ARFOR publishes WARNO 2, or it can be gained through reach operations using Trojan Spirit. By having Trojan Spirit collocated with the squadron TOC, the staff has the ability to ac-

cess large amounts of information about the upcoming operation. By providing Trojan Spirit operators with specific requests for intelligence, they can conduct reach operations to access information from both theater- and national-level agencies. In addition, the intelligence analysts that are part of the Trojan Spirit crew can process the gathered information into a usable format to support the squadron's planning process, highlighting specific information of interest or concern.

As the squadron continues to develop the ISR plan, information is shared and coordinated between the squadron and SBCT staffs. The squadron staff relies on the SBCT staff to provide resources, support, and synchronization needed to execute ISR operations. If resources are unavailable, or being withheld to support the overall SBCT mission, the squadron staff must refine the ISR plan to mitigate any associated tactical risk. The bottom line is that each staff section within the brigade must be aware of the ISR planning process and staff officers must be prepared to conduct collaborative planning as the squadron staff completes ISR planning. It is also understood that the ISR plan cannot restrict or detract from the SBCT's main planning effort. By working in close coordination, the two staffs ensure that the ISR plan is developed to provide the greatest amount of flexibility to the SBCT commander during the conduct of brigade combat operations.

Digital Connectivity and Messaging

Figure 2 depicts the upper and lower tactical internet architecture, as well as other key command, control, communications, and computer ISR (C4ISR) elements. The squadron communicates and maintains connectivity with subordinate elements through FBCB2 and combat net radios. These two systems allow for effective battle command, not only within the squadron, but also throughout the SBCT. The squadron maintains connectivity with adjacent and higher units primarily through FM and tactical satellite communications, and ABCS.

The primary method for reporting initial combat information to the squadron TOC is via FBCB2 SPOT (standard Army report of tactically important combat information) reports. These reports are sent from the individual section (or sensor) via FBCB2 to the squadron CIC remote workstation (RWS). An entity of the transmitted record is then posted on the unit's FBCB2 digital maps. The secondary means (or to confirm receipt) for transmitting SPOT reports is via FM voice communications, using the squadron operations and intelligence net.

The imbedded counterintelligence/human intelligence (HUMINT) agents located in each recce team provide additional source information. As reporting occurs through HUMINT channels, information of immediate tactical value is reported

via FBCB2 or FM to the squadron TOC. HUMINT information that supports higher-level source operations is transmitted in a source lead development report or screening report format via individual tactical reporting tool/counterintelligence human intelligence automated tool (ITRT/CHAT) sets. These HUMINT-specific reports are sent from the recce team, through the troop and squadron TOC, to the brigade S2 (X) cell.

Once a SPOT report arrives at the TOC, the information is entered into the CIC RWS, if not received automatically through FBCB2. This information is reviewed by the RWS database manager against current information in the database, and is either correlated (if an entity already exists), or a new unit icon is created — the RWS database transmits via embedded battle command (EBC) back down to FBCB2. If this icon meets pre-established alert criteria based on commander's critical intelligence requirements (CCIR), an enemy order of battle spot report (EOBSREP) message is immediately transmitted to the SBCT TOC. For tactical unmanned aerial vehicle (TUAV) reporting, the ground control station (GCS) controlling the TUAV submits RECCEXREP (specific report format used to send imagery intelligence reports through digital intelligence systems) reports directly from the GCS collocated with the TOC to the RWS. The database manager prints the report and gives it to the battle captain for issuance within the TOC. The messages are then disseminated to the maneuver control system-light (MCS-L) operator who controls the command and observation post assessment overlay. Concurrently, the battle captain disseminates this information to other staff sections for action.

After processing reports within the TOC, the information is scrutinized against CCIR and the appropriate tracking charts on the LSD are updated. In addition to these immediate reports, external database coordination (EDC) messages are received in the RWS (at pre-subscribed times) from the SBCT's military intelligence company. These messages reflect the consolidated brigade database of reports within the entire brigade, along with messages received from higher and adjacent units. Any information within these messages that was not generated within the squadron is consolidated into the database, and thus disseminated via EBC to FBCB2.

Messaging between the squadron and the brigade consists of the EOBSREPs transmitted via RWS and the EDCs received from brigade. As the primary intelligence collector for the SBCT, the squadron relies on the brigade to forward echelon above brigade reports that are sent from higher echelon sensors that do not report directly to the squadron. In addition to the EDCs, information of immediate concern obtained by the brigade is transmitted via voice or EOBS-REP to the squadron. As previously mentioned, this information is consolidated in the RWS database for dissemination to the FBCB2s and updated on the MCS-L assessment overlay for display in the CIC. In addition to sending and receiving messages and EDCs, at a minimum of every 12 hours, video teleconferences are conducted over the Trojan Spirit network to synchronize squadron and brigade assessments and expected activity for the next time period.

Squadron Command Post Configuration

In the contemporary operating environment, future operations will take place within a nonlinear and noncontiguous battlefield framework. This fact and given the capability of the brigade to conduct rapid maneuver over a large battle space, tactical operations centers must be small, mobile, and possess the full range of ABCS capabilities. To effectively provide battle command during ISR operations, the reconnaissance squadron TOC is designed to quickly move/establish operations on the battlefield, provide maximum C4ISR connectivity and communications, and present a small, survivable footprint from which to operate.

The two main components of the TOC are the squadron CIC and the squadron plans cell. Current ISR operations are executed through the CIC, while the plans cell prepares for future operations. Additionally, the plans cell serves as a jump TOC — used to "echelon" command posts (CPs) and facilitate rapid repositioning of the squadron's command and control facilities. Both facilities are identical in ABCS and communications architecture, and provide the squadron commander the flexibility to execute and plan for simultaneous reconnaissance operations over large distances. Additionally, both components of the TOC present the smallest possible footprint, while maintaining maximum command and control capability, which increases the survivability of the squadron's command post and its ability to occupy and conduct operations in dense, restricted terrain.
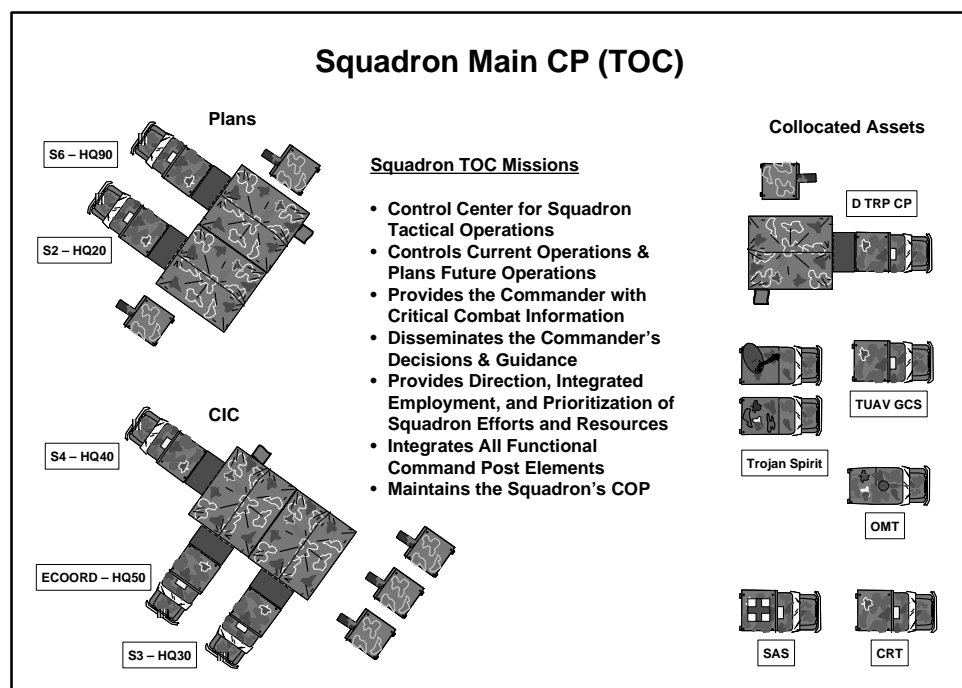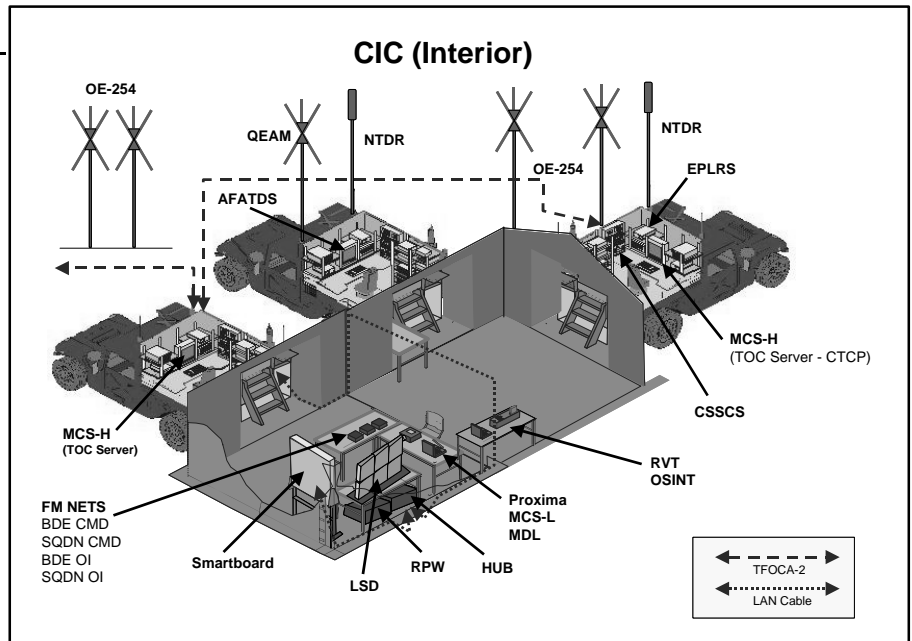

Figure 3. Reconnaissance Squadron Command Post

Other elements that are essential to squadron operations also collocate with the squadron TOC. Specifically, the surveillance troop command post and TUAV ground control shelter, and an operational management team (OMT) from the management of information control officer tactical HUMINT platoon are integrated into the TOC perimeter and provide subject matter expertise during the squadron's planning process. The surveillance troop CP personnel ensure that specific troop sensors for signal intelligence, measurement and signature intelligence, imagery intelligence, and nuclear, biological, and chemical reconnaissance are properly employed within capabilities. The TUAV technician provides oversight of TUAV operations and completes Army airspace command and control planning requirements with the brigade's digital air defense system used to facilitate air defense planning and execution (ADAM) cell. The OMT provides subject matter expertise regarding source operations and the development of HUMINT related requirements during the squadron's planning process. Additionally, during execution of ISR operations, the OMT provides direction to tactical HUMINT teams operating within the squadron's area of operation and they provide additional quality control for the submission of ITRT/CHATS-generated reports from recce troop intelligence agents.

To better support operations, the squadron trains collocate with the squadron TOC. The trains' elements that operate within close proximity to the squadron TOC include the combat trains command post, the squadron's combat recovery team, and the squadron aid station.

The last component of the squadron command and control architecture is the squadron TAC. This command post consists of the squadron commander, operations officer, and air liaison officer. The TAC will generally be positioned at the point on the battlefield to best facilitate command and control of squadron elements that are focused on the SBCT commander's primary decision points. However, due to its small footprint and high mobility, the TAC can be positioned at the place and time required to allow the squadron commander to best command the squadron. Figures 4 and 5 illustrate the ABCS and communications architecture in both the squadron CIC and plans cell. These illustrations are self-explanatory in describing the locations of key ABCS and communications components.

The advantage of having two ABCS components identically equipped to the squadron TOC is evident. The squadron commander and staff have a command and control facility

Figure 4. Reconnaissance Squadron Command Information Center (Above)

Figure 5. Reconnaissance Squadron Planning Cell (Alternate CP)

- LSD – Large Screen Display
- MDL – Mission Data Loader
- OSINT – Open Source Intel
- RPW – Remote Pentium Workstation
- RVT – TUAV Remote Video Terminal
- NTDR – Near Term Digital Radio
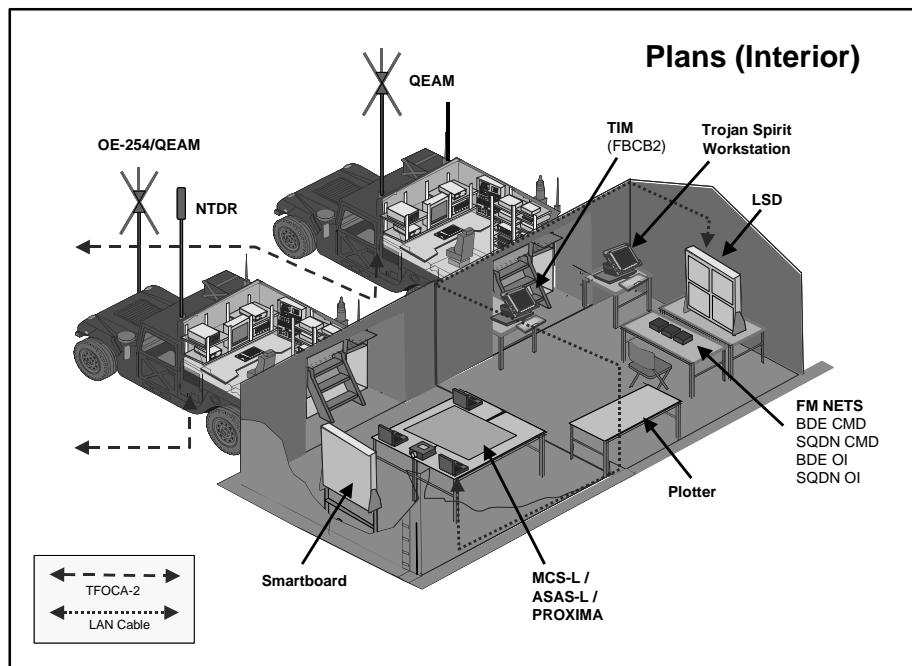
that provides the greatest flexibility for planning and executing ISR operations. Based on mission requirements, these components can be positioned at decisive locations on the battlefield to ensure effective C4ISR connectivity between the squadron, SBCT command group and TOC, and adjacent and higher units. Lastly, this command post design provides the smallest possible footprint, without compromising capability, to remain as survivable as possible.

Digital Skills Sustainment

To effectively and efficiently conduct ISR operations, the squadron staff must be proficient at conducting the MDMP.

And, arguably more important, the staff and ABCS operators must be highly proficient in establishing connectivity and manipulating digital systems. To ensure staffs and operators are highly trained in using ABCS, units must integrate these systems into daily unit operations.

There are two considerations to integrating ABCS into daily operations. First, the unit must physically establish ABCS in the garrison environment. Second, the staff and system operators must use ABCS as often as possible to facilitate unit operations and consider dedicating time to conduct weekly "digital" staff training.

To establish ABCS in the garrison environment, units must have the requisite amount of office space to ensure all systems can be set up. Figure 6 depicts an example of how ABCS can be integrated into the S3 plans shop in any digital unit. This design allows systems to be operated on an isolated network within the confines of the plans shop. If required, the TOC vehicles can be positioned at the back door of the plans shop and connectivity can be established within the normal upper TI network. To better support this architecture, work orders can be submitted for installing tactical fiber-optic cable assemblies (to facilitate quick establishment of the TOC local area network) and a power distribution box (to eliminate the constant use of vehicle generators to power the systems). Additionally, OE-254 antennas are mounted on the exterior of the building to allow long-range FM communications. Overall, this configuration allows for daily ABCS operations, as well as provides a contingency planning facility for the squadron staff.

Like any other technical skill, digital skills are extremely perishable. To prevent degradation in ABCS skills, operators must constantly use the systems for which they have been trained. One recommendation for keeping operators current and highly trained is to use ABCS daily to monitor unit activities. Instead of having a map board in the S3 shop with "sticky" icons that show unit locations during training, power-up the ABCS and use the digital maps and icons to represent unit locations. If a net control station-enhanced positioning locating and reporting system or fixed TI is available, the unit headquarters will have real-time situational awareness of where all subordinate units are training. Additionally, by developing garrison CCIR and monitoring critical events, ABCS operators can practice information management skills — with key information being displayed and tracked on the LSD.

Finally, the challenge of all unit staffs is finding the time to conduct training on the staff planning process. Developing a plan is the result of a combined effort from all staff members. And, although each staff officer must be extremely knowledgeable and proficient in his respective battlefield operating system, the organization will succeed based on the collective proficiency of the staff. It is imperative that unit staffs dedicate time to practicing the planning process.

ABCS and FBCB2 do not change the fundamentals of the MDMP. However, there are TTP that must be practiced when using digital systems in executing the planning process. Once units determine which planning products will be used to facilitate collaborative planning, a clear and simple standard operating procedure (SOP) must be developed that articulates how digital systems support the unit's MDMP. ABCS can support a much more efficient planning process and this SOP must be understood staff wide to ensure that sections are spending more time planning the operation than figuring out how to use the digital systems.

During the past 14 months of conducting transformation activities within the reconnaissance squadron of the SBCT, several lessons have been learned on how to leverage digital systems to facilitate ISR operations planning and execution. This article has outlined these points and provided discussion on the collaborative ISR planning timeline and process, the digital architecture and how the reconnaissance squadron establishes connectivity between a wide array of digital C4ISR systems, the squadron command post design and how it facilitates SBCT and squadron ISR operations, and some home station training techniques that have proved useful in sustaining staff and digital skill proficiency. The comments in this article are based on physically practicing the TTP discussed though the execution of

Plans (S3 Shop)

MSC-L / ASAS-L / MDLS

Plotter

RPW / Proxima

Hub / Router

Smart Boards

LSD

Printer / Scanner

Secure Storage / SIPRNET Drop

TS Workstation

ASAS-H (TOC Server)

TIM

S3 shop pre-wired w/TFOCA-2 cable and OE-254.

Power distribution box outside rear door of S3 shop.

HQs 30 positions at rear door and allows Contingency TOC to enter the network via NTDR.
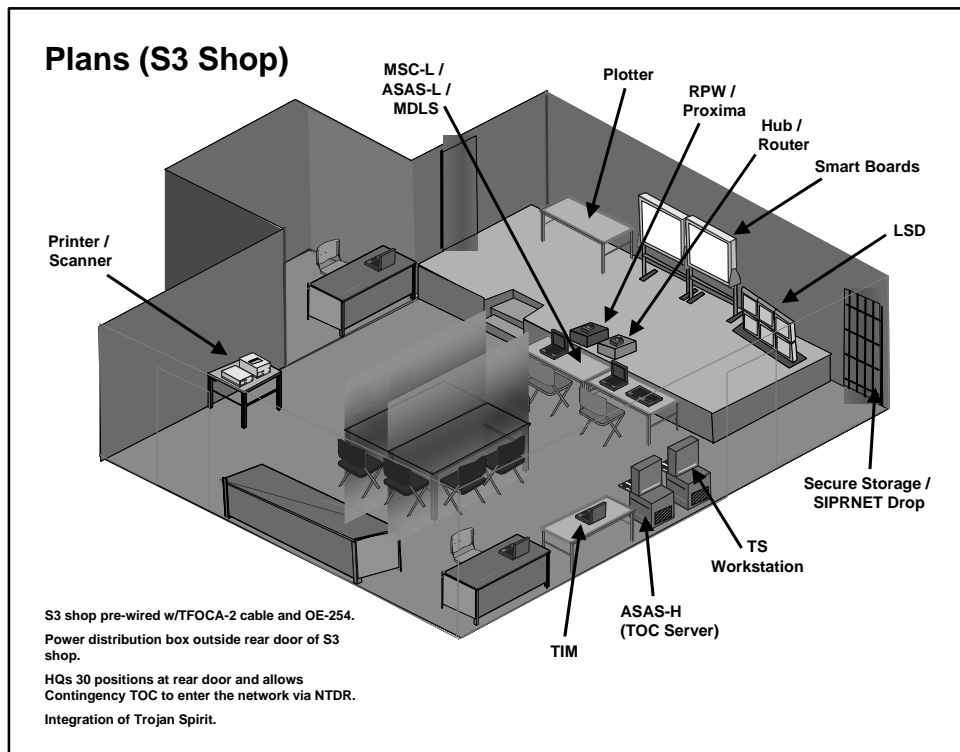
Integration of Trojan Spirit.

Figure 6. Reconnaissance Squadron "Digital" S3 Shop

Defensive Armor Deployments in Urban Areas

by Nader Elhefnawy

A survey of the literature on armored warfare shows that relatively little consideration is given to the defensive use of armor in urban areas, for a number of reasons. However, two main factors are the aversion of conventional militaries to urban warfare generally, and that infantry tends to be the principal player in urban areas with armor deployed in support, which consequently caused the development of doctrine for armored units to lag behind that of other arms.[1] This is beginning to change after realizing, over the past several years, that American units will not be able to avoid fighting in cities, and that armor will play a crucial role in such warfare.

However, those occasions on which armored forces have fought in urban areas in recent years have seen armor used in an offensive capacity, as with the Russian forces in Grozny. Similarly, most scenarios in which the United States is likely to deploy armor in urban combat, namely the burgeoning cities of the Third World, see U.S. forces taking the offensive, which is why American tankers train that way. Additionally, the emphasis is on low-intensity conflict and peacekeeping, so the assumption is that those opponents the United States will face in urban areas will be lightly armed, with little, if any, armor. While this was true in Panama and Somalia, it will not always be the case. Therefore, the likelihood that some potential U.S. adversaries will deploy sizable tank forces inside urban areas should be considered, which makes how these forces may be used, and the challenge U.S. forces could face, well worth a closer look.

Armored Forces and Urban Areas: A Convergence

The increasing importance of urban warfare in a world where armor is so widely proliferated suggests that the United States should plan to face tanks, and even tank-heavy forces in urban warfare. While the heaviest weapon that the Panamanian Defense Forces fielded was an armored car, over 110,000 main battle tanks are in service worldwide, even after the massive Cold War cutbacks that drastically reduced the number of tanks in Europe. It may be that over half of these belong to NATO, the Russian Federation, or China; there are, for instance, 30,000 tanks in the Middle East and South Asia.

Even in regions where battle tanks number in the low thousands, such as sub-Saharan Africa and Latin America, lighter armored vehicles, including light tanks, infantry fighting vehicles, and scout cars mounting antiarmor missiles and heavy guns, are quite widespread. Counting in such light armor, or self-propelled artillery, which can be used in close combat as a direct-fire weapon, the number would be higher still, more than 300,000 vehicles worldwide. States aside, nonstate actors, like warlords, are often able to amass sizable armored forces, particularly when a major state breaks up, as happened in the former

"In the Kosovo conflict, the possibility that U.S. forces would have to fight in Yugoslav cities, and against Yugoslav heavy forces was raised, though quickly forgotten when airpower appeared to have been enough. Today, the possibility that the United States will engage in urban warfare in Iraq, which also possesses a substantial tank park, makes the issue timely again. Even if war is avoided, or airpower proves to be enough, the possibility of such a conflict elsewhere in the near future remains."

Soviet Union and Yugoslavia, and could conceivably happen elsewhere. The number is thought likely to decline in the near future as older tanks are shed, and the high cost of modern replacements encourages the purchase of fewer, though more capable, vehicles. Despite that, a high estimate claims that nearly 100,000 tanks will still be in service in 2015. However, even one-half of the number of tanks in the Third World regions where American military interventions are likeliest will still mean tens of thousands of armored vehicles in service.

At the same time, cities are increasingly important as centers of gravity, making urban warfare more likely. In Carl von Clausewitz's day, the significance of capital cities was that they contained a government's administrative apparatus. Today, they are also the principal concentrations of human and materiel resources, and the urban sprawl resulting from industrialization and urbanization means they simply cover that much more of the landscape. Between 1950 and 2000, the percentage of the world's population living in cities rose from 29 percent to 50 percent, even as the total population more than doubled within that time frame, and those cities now comprise one percent of the planet's surface.

The likelihood of scenarios that armored forces may have to face in these sprawling urban areas grows even more apparent when the details are examined. The vast majority of the world's tank forces are, after all, compared unfavorably with first-line Western, Israeli, or other such armored forces, and are likely to remain so, given the high cost of replacing older tanks or their lack of comparable resources for training.[2] Though this is not to say that all armored forces that the United States may face in the future will be as outmatched as Iraq's was in 1991, they will likely be inadequate against a high-tech military like that fielded by the United States, even if suitable for dealing with internal enemies or neighbors. The owners of these tank forces may

consequently opt to engage in urban warfare, and to deploy their armor accordingly, a problem that is no longer theoretical. In the Kosovo conflict, the possibility that U.S. forces would have to fight in Yugoslav cities, and against Yugoslav heavy forces was raised, though quickly forgotten when airpower appeared to have been enough. Today, the possibility that the United States will engage in urban warfare in Iraq, which also possesses a substantial tank park, makes the issue timely again. Even if war is avoided, or airpower proves to be enough, the possibility of such a conflict elsewhere in the near future remains.

Dispersing armored forces in urban areas in such a scenario poses a number of challenges for U.S. forces, particularly the airpower that appeared to many observers to be a panacea following U.S. successes in the Gulf and the Balkans during the 1990s.

While assuming the capability of airpower that can go virtually anywhere and destroy anything that can be seen with precision-guided munitions, scholar Daryl Press argues, static, defensively situated forces are relatively immune to air attack for a number of reasons.[3] One reason is they place lower demands on logistics, and communications and control systems. Because they consume fewer supplies, they suffer less from a communications loss, particularly if they had the opportunity to accumulate supplies in theater beforehand. Another reason is they produce less heat, noise, and radio traffic, which makes it more difficult to reliably identify them for targeting and damage assessment after the fact, or for that matter, for attack aircraft to distinguish between real targets and decoys from medium level.[4] Such problems are far more pronounced in urban areas than in the desert, given that these are "dirty" environments with a number of nonmilitary devices generating thermal, magnetic, and electromagnetic signatures.[5] Consequently, softening up armored forces with air strikes aside, the difficulty that cities pose for gathering good

technical intelligence will undermine the effective conduct of urban operations in general.

In the Killing Zone

Engaging a defensively deployed armored force in an urban area presents challenges quite different from taking them on in the desert. The sheer size of modern cities and the reduced troop strength of all militaries make encirclement more difficult, suggesting greater opportunities for defending forces to escape to fallback points, or to conduct counterattacks (though dismounted infantry may be better able to exploit such openings than armor). More importantly, while the defensive may be the stronger form of combat in most environments, this is especially the case in terrain where mobility is severely restricted. With mobility — armor's crucial characteristic — reduced, its outstanding attributes become those of protection and firepower; characteristics that tend to favor the defensive at the expense of the offensive.

The fragmented nature of inner cities may also erode key advantages that U.S. armor had in the Gulf during 1991, such as the longer reach of U.S. tank guns. In the open desert, U.S. M1s regularly scored first-round kills at Iraqi tanks four kilometers away, long before Iraqis could fire their first shot. In the broken terrain of an urban environment, engagements are likely to occur at much shorter ranges. While the direct-fire capability of defending tanks is diminished, a force of T-55s or T-72s facing a force of M1s or Challengers has less to lose, the shorter-range engagements allow older, lower quality tanks and less well-trained crews to get the most out of their systems before more advanced systems can kill them. Channeled by the streets, with little room to maneuver, U.S. armor would be less able to mass its superior firepower or outmaneuver an opponent, which, in turn, makes the inadequacies of a defender's command, control, communications, and intelligence less problematic. Where mobility is concerned, old-

Photo by Robert L. Stevenson

"Defensively employed tanks may also be used in ambushes from preselected and camou-flaged firing positions, sniping at advancing forces from cleared-out first floors or garages (possibly from basement level), canals, and the reverse slopes of hills or trenches, which have been dug in parks or streets where other tanks would have difficulty depressing their guns adequately to engage them. The tanks could conceivably occupy hillsides, bridges, or overpasses offering the high ground inside a city, enabling them to target an approaching tank's thinner topside armor."

er Russian-style tanks, like the T-72, may benefit from their smaller size and lower silhouette that makes them easier to conceal and better enables them to negotiate narrow city streets; the same applies to light armor.

That said, a word on the tactics that defensively employed armor may use is in order. One of the principal missions of armor in urban settings is protecting barricades and other obstacles, which will likely force short-range engagements as U.S. armor approaches to destroy it with gunfire. In providing overwatch for such barricades, the complexity of urban environments would offer virtually innumerable opportunities for the creative integration of tank guns with other fires, and also make "knowing the terrain" much more important than in the case with featureless desert or plain.

Aside from reducing the range at which engagements occur (giving a less potent tank gun like that mounted on the T-72 a better chance of inflicting damage), such strongpoints will give the defending armor the benefit of cover and concealment, making the tanks defending them harder to target. Being behind a barricade able to absorb some of an attacker's fire, they will also be

more survivable. U.S. Army Field Manual 90-10, *Military Operations on Urbanized Terrain*, calls for such strong points to be mutually supporting with concealed routes of movement between them, and dispersed in depth, so that points of the perimeter coming under attack can be shored up, and armor has room to fall back.[6] Penetrating a city center is likely to involve fighting through a series of such barricades.

Defensively employed tanks may also be used in ambushes from preselected and camouflaged firing positions, sniping at advancing forces from cleared-out first floors or garages (possibly from basement level), canals, and the reverse slopes of hills or trenches, which have been dug in parks or streets where other tanks would have difficulty depressing their guns adequately to engage them. The tanks could conceivably occupy hillsides, bridges, or overpasses offering the high ground inside a city, enabling them to target an approaching tank's thinner topside armor. Armored units can also stay hidden in such positions, play dead, or permit enemy units to bypass them, turning then on the rear of those enemy units, or participate in counterattacks, perhaps against more fragile lines of communication.

Hit-and-run attacks are also conceivable. While the size of modern tanks and the impediment to their mobility caused by broken urban terrain make this difficult, the methodical approach necessarily followed in taking a city may give them the chance to escape. While U.S. armor can keep up with any conceivable opponent's armored or mechanized units, they will not readily give chase, given the risk of being led into a kill sack. Moreover, such attacks can be conducted by lighter armor, or for that matter, cars, jeeps, or light trucks carrying armed passengers, some of which may also mount heavy machine guns, recoilless rifles, and missile launchers. Forces so equipped performed spectacularly in Chad, and while a modern inner city is not the desert, and U.S. forces will *not* perform like the Libyan mechanized units of the 1980s, this opens another avenue for enemy action. Again, while mobility within cities is generally hampered, relatively ubiquitous cars will have a higher relative mobility in city streets than 40-, 50-, and 70-ton tanks, and while they are unlikely to destroy a battle tank, they can supplement the armored forces by acting as scouts, and harry advancing U.S. forces. Cars used by military or paramilitary forces as infantry fighting vehicles and light trucks being used as assault guns are unlikely to be neutralized from the air, and relatively numerous, defending forces perhaps commandeering suitable civilian vehicles for the purpose. Tank commanders will have greater incentive to button up their vehicles, dismounted infantry and light armor will be vulnerable to their weapons and the cumulative effect of multiple hit-and-run attacks will be to further slow the advance.

The vulnerability of infantry without armor has been demonstrated time and again, and the vulnerability of infantry *to* armor is no less of a problem for U.S. forces. A defending force is likely to seek out situations in which it can use its armored forces against unprotected infantry. So-called "surgical" urban strikes, as the October 1993 firefight in Mogadishu demonstrated, can go badly — light forces getting cor-

nered on the ground; how much worse would the battle have gone if the Somalis had a couple of T-72s with them? The nonlinearity of urban environments makes situational awareness elusive, and suggests that infantry may get cut off from their armor support during the course of operations. Separating attacking infantry from their supporting armor would also be a logical approach. Armored units could rely on antitank teams to take out advancing armor, and then turn their firepower on the unprotected infantry. The Chechens in Grozny routinely did this by using snipers to pin down infantry long enough to attack their escort tank with multiple rocket-propelled grenades or Molotov cocktails. Had they then used tanks (perhaps kept in hiding places near the scene of the ambush) on the forces left exposed, the war may have gone even more poorly for the Russians.

Tank confrontations described here do not have the makings of a decisive battle, but they would provide a defending armored force with opportunities to inflict casualties or damage that they would not have in other environments, perhaps the only way that they may get use from an ill-trained, obsolete tank force that the United States is most likely to face. It would instead be a question of attrition, opposing forces attempting to maximize U.S. losses, targeting above all else, America's sensitivity to casualties. Such a strategy may also compel some unconventional approaches on the part of defending forces. For instance, instead of antiarmor units permitting scout vehicles to pass and wait for heavier armor before attacking and giving away their positions, they may turn their firepower on the more lightly protected and less well-armed scouts. Well-hidden tanks may wait for armor to pass, and target the dismounted infantry or supporting vehicles coming from behind.

The deployment of tanks in urban areas as described here means that U.S. armor may frequently be taken by surprise, and unable to get the first shot, so we will have to withstand more and closer-ranged attacks than in open terrain. However, U.S. tanks appear relatively impervious to most of the tank guns they are likely to encounter; only a small percentage of the hits scored by T-72s in the Gulf resulted in damage, and none of those hits destroyed a U.S.

tank. Particularly where barricades are concerned, aerial reconnaissance conducted by low-flying helicopters may go a long way to avoid nasty surprises. Rooting out ambushes by hidden vehicles will be a question of doing the best possible job with reconnaissance, analyzing the terrain intensively beforehand with an eye to potential danger areas, and a special emphasis on human intelligence gathering to identify the threats in advance. The risk that infantry may get isolated and savaged by defending armor calls attention to the need for close integration between armor and dismounted infantry, and also for armored forces to extricate trapped pockets of infantry, as should have happened in Mogadishu.

None of this bespeaks a major change in the theory and practice of urban warfare as it is presently understood, but it does suggest that armored warfare in cities will be somewhat less one-sided than it was in the southern Iraqi desert during 1991. Over the longer term, however, the problem will drive innovation in the development of armored forces. M1s may be upgraded, with everything from sensors and displays to give a buttoned-up tank commander a three-hundred-and-sixty-degree view of the terrain around him to active defense systems able to knock an incoming rocket off its flight path. Net-centric tanks, swapping the conception of a "land battleship" for a "land carrier battle group," for instance, may smooth the integration of infantry with armor in combined-arms operations by enabling them to plug into a common net. Future tanks, unitary or net-centric, may deploy their own aerial reconnaissance in the form of miniature drones launched from their component vehicles. Combined with weapons able to strike targets outside the line of sight, such as missiles that can maneuver around street corners, miniature drones may give greater meaning to the capacity of U.S. forces to survey even the most complex environments.

Given the recent experience of armored forces in urban areas, it is not surprising that the defensive employment of armor in urban areas has been given little consideration, but the likelihood of urban conflict, and the number of tanks in service worldwide, suggest that some rethinking is in order. Engaging an adversarial armored force in ur-

ban warfare is likely to diminish certain U.S. technological advantages, particularly those in reconnaissance, command and control, and the capability to destroy targets at long range.

Nonetheless, those advantages are ultimately so great that this erosion is unlikely to change the outcome of a major battle, which potential opponents are likely to appreciate. Instead, they may see using a large, but outmatched armored force to slow down an incursion into an urban area and maximize U.S. losses as a better option than leaving it to be gradually ground down from the air or swiftly annihilated on the ground by more modern air and land forces. The prospect of such conflict is also unlikely to change the fundamentals of urban operations in the near-term, but rather reaffirm them and continue to drive innovative thought on better adapting armor to urban situations. In the meantime, widening recognition of, and increasing thought about, the potential for not merely armored operations, but tank-on-tank combat in built-up areas is a modest but necessary step.

Notes

[1]Captain J.P. Klug, "Armor's Role in Future MOUT Doctrine," *ARMOR,* May-June 2000.

[2]R.M. Ogorkiewicz, "The Outlook for Tanks," *Jane's Land Forces,* 4 June 2002.

[3]Daryl G. Press, "The Myth of Air Power in the Gulf War and the Future of Warfare" *International Security*, Fall 2001.

[4]Aircraft can conduct attacks from lower level, but greatly risk themselves to antiaircraft guns and man-portable surface-to-air missiles. While more effective bombing may seem worth the risk, that risk runs against the idea of aerial warfare as a casualty-free affair, a principal justification put forth by air power proponents.

[5]Lt. Gen. J.E. Rhodes, "A Concept for Antiarmor Operations," *Marine Corps Gazette*, September 1998.

[6]U.S. Army Field Manual 90-10, *Military Operations on Urbanized Terrain*, Washington, D.C., U.S. Government Printing Office, 15 August 1979.

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THROUGH THE DEFILE:
Attacking Through Restrictive Terrain

by Captain Mike Sullivan

Damn it. "Checkpoint 8 into Check-point 54 again," thought the armor team commander as he walked away from the battalion operations order (OP-ORD). "I know the OPFOR has that defile covered with both direct and indirect fire weapons systems. How the heck am I going to get through that defile without losing all my combat power again?"

How many times has this question entered your mind? Whether during combat or at one of the Combat Training Centers (CTCs), getting through the defile is one of the toughest missions for a mounted unit. As the U.S. Army continues to fight in restrictive and limited terrain, the Armor force must transform its thinking away from the open plains of Europe and the rolling sands of the Middle East. Mounted forces must overcome restrictive terrain, whether mountain passes, thick forests, or urban buildings. Using a planned attack through Combat Maneuver Training Center (CMTC) Checkpoint (CP) 8 into CP54 allowed us to work though a successful defile drill.

Situation

The mission is to attack from east to west, up Regulator Valley through CP8 and seize Objective Grant, the high-ground vicinity of CP54 (The Griffen-wang), to restore the international boundary line. See Figure 1.

The company team consists of two tank platoons equipped with four M1A1s (White and Blue platoons); one Bradley platoon equipped with M2A2 Operation Desert Storm (ODS) (Red platoon); two dismounted squads; the commander's tank; the executive officer's tank; the first sergeant's M113; one maintenance M113; and one medic M113. The fire support team (FIST) officer is riding in his M981 FIST-vehicle (FIST-V) to call in accurate indirect fires.

Based on the intelligence report from the battalion S2, we can expect eyes forward of CP8 covering the Regulator Valley, possibly one BMP (Russian infantry combat vehicle) and one BRDM (Russian threat scout car). On the other side of CP8, overwatching the deadly defile is one reinforced platoon, three BMPs and one T-80. The enemy situational template (SITTEMP) below clearly indicates the potential enemy engagement area covering the exit of the defile.

U.S. Army Field Manual (FM) 71-1, *Tank and Mechanized Infantry Company Team*, discusses clearance in restrictive terrain, which describes a defile drill exactly.[1] FM 71-1 states, "Conducting clearance in restricted terrain is both time-consuming and resource-intensive." During the planning process, the commander evaluates the tactical

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requirements, resources, and other considerations for each of the three pieces of the operation:

• Approach (the restricted terrain).

• Clear (the area in and around the restricted area).

• Secure (the far side of the objective area).[2]

Our attack will therefore be broken into three parts. The first is the approach up to CP8. In this case, up through the Regulator Valley and eliminating the eyes forward of the defile. Our next part will be clearing through CP8 and out of the defile. Our final part of the assault to seize CP54 is securing our objective.

Approach. Some critical tasks listed in FM 71-1 approaching the defile are:

• Move dismounted infantry elements along axes that provide cover and concealment.

• Provide support-by-fire for the dismounted infantry. Be prepared to cover infantry elements from their dismount points to the points at which they enter the restricted terrain.

• Provide additional security by incorporating suppressive indirect fires and obscuring or screening smoke.

• Establish support-by-fire positions with the team's tanks and Bradley Fighting Vehicles (BFVs); destroy or suppress any known enemy positions to allow forces to approach the restricted terrain.
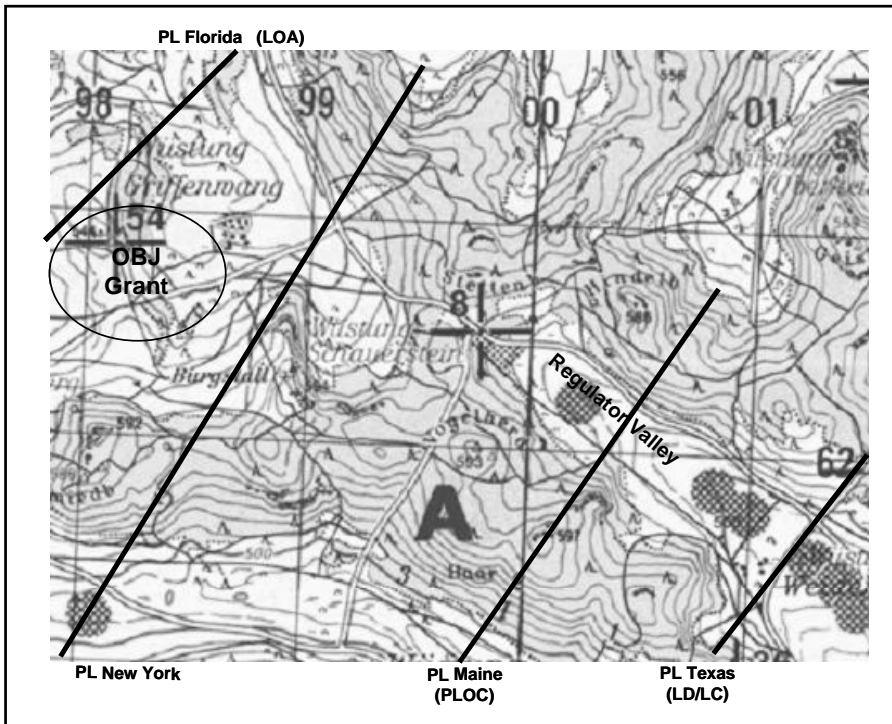
Figure 1

These tasks are listed in the reverse order of FM 71-1 for a specific reason. Due to time constraints and the highly lethal use of OPFOR artillery, speed is critical to get to the defile. The commander develops a rather unorthodox plan to clear the Regulator Valley up to CP8. Operating in split sections, the infantry platoon (Red) moves with two M2A2 Bradley's up each side of the valley in the wood line. The Bradley's orient their fires forward. Approximately 150 meters behind each Bradley section is a two-tank section (White) orienting their fires *across* the valley to the opposite walls. Figure 2, from FM 71-1, demonstrates this crossfire technique when clearing up a valley.

Based on the enemy SITTEMP, the company commander designates a probable line of contact (PLOC) at Phase Line Maine for the infantry platoon. Approximately 100 meters from this line, the Bradleys will drop ramps and let the dismounted squads clear the woods forward. The dismounted infantry carry enough firepower to knock out light armored vehicles and are supported by their organic Bradleys. This technique is much more effective in combat where the 25mm's full capabilities can be seen. In combat, an 8-inch tree will not stop a 25mm antipersonnel round and the suppressive effects against dismounted infantry with a 25mm high explosive (HE) round is devastating. Acting as the beaters, the infantry platoon is to clear the woods for the enemy eyes forward. The split sections of tanks are the hunters, orienting ahead of the infantry platoon, looking to make the kill shot. The XO with the FIST officer follows behind White platoon.

Key to successful direct fire controls of the split sections operating with dismounted infantry is to know exactly where the dismounted squads are operating in the wood line. Although the tanks have thermal sights capable of sighting troops in the woods, only with established signals can the vehicles correctly identify friendly soldiers. Some techniques to mark the frontline trace of the dismounted squads include:

● Marking the man nearest to the wood line with a VS-17 panel, chemical light or phoenix beacon.

● Using smoke grenades with color to indicate position (violet) or contact with enemy bunkers requesting armor support (yellow).

● M203 parachute flares (remove parachute) shot toward open areas to show dismounted progress, or star clusters during night operations.

Following approximately 300 to 500 meters behind Red and White is the Blue platoon. Acting as the assault element, Blue platoon's mission is to assault through the defile and destroy enemy vicinity CP54. Alpha 6 and his crew move with Blue platoon to maintain control over the company and to be with the assault force. "All Alpha elements, this is Alpha 6, line of departure (LD) time now."

As Team Alpha moves toward CP8, a steady roll of armored forces advance toward the enemy. Fortunately, no contact is made prior to the PLOC. Red 6 pushes his dismounts forward while the Bradleys maneuver to provide cover. White platoon continues to scan the wood line for any enemy forces while continuing a slow move staying within 150 meters of the advancing Bradleys. Frontline traces are continually called over the company net to advise all players on Red's progress. Slowly, dismounted infantry controlled by their squad leaders push through the cold, wet pines looking and listening for enemy sounds. The northern squad leader pauses as he focuses on a glint of sunshine to his front. Suddenly, an engine starts to their front and a BRDM breaks toward the valley. An AT-4 fires but misses by a long shot. As the BRDM
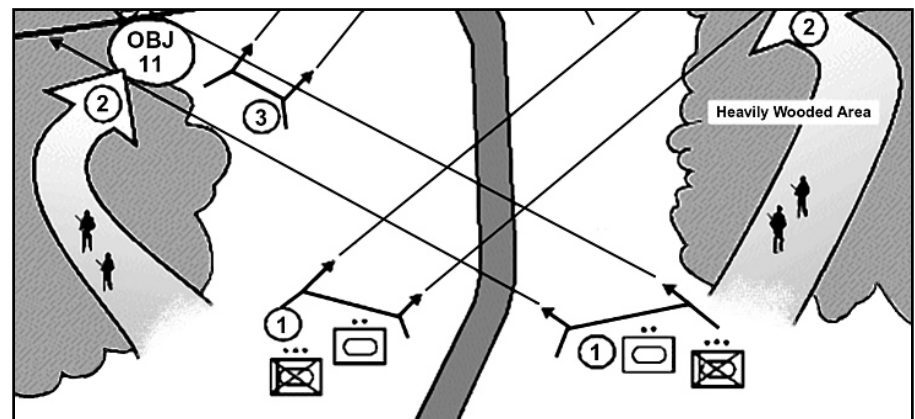

Figure 2

tries to maneuver around thick trees, it disappears in a shower of sparks and flames as Red 8 pumps three 25mm HE rounds into the wheeled vehicle, destroying it completely. "Alpha 6, Red 7. Engaged and destroyed one BRDM, time now. Continuing mission, Slant 4, over." "So, the SITTEMP was fairly accurate," thought Alpha 6. "Red 7, Alpha 6. Roger, Out."

Continuing their move, Team Alpha advances toward CP8. Just as the southern dismounted squad hears metal on metal, a BMP opens fire, launching round after round of 30mm toward the Bradley platoon. Red 9 feels the impact of rounds against his vehicle, blowing the track off his Bradley. Before he has time to slew the turret, 30mm rounds explode through the hull, killing the crew. Red 7 spots the flashes through the pines and immediately begins to suppress. The dismounts start to flank around the BMP. Realizing dismounts are maneuvering on his position, the OPFOR tank commander (TC) decides to break contact. Backing his BMP up, the TC pivots past an opening in the trees when... BOOM! A 120mm high explosive anti-tank round fired from White 8 puts an end to his maneuvering. The valley is clear. Dismounted infantry squads start their climb up to CP8.

Alpha 6 realizes the enemy must have preplanned artillery all around CP8. Knowing his team is approaching the defile, he contacts his FIST. "Alpha 17, Alpha 6. Fire linear smoke target AE4041, over."

Prior to beginning his assault, Alpha 6 and his FIST plan artillery and mortar targets to assist in their mission. Alpha 6 requests and receives battalion mortar priority of fires from his commander. Knowing the battalion 120mm mortars will provide rapid and lethal fires, Alpha 6 plans two targets on the templated enemy position, AE 2020 and AE 2021. The task for each target is to suppress the enemy with the purpose of facilitating the attack through the defile. With his field artillery priority of fires, Alpha 6 plans three linear smoke targets, AE 4041, 4042, and 4043. Alpha 6's thought process is to plan different smoke targets depending on the winds. Once the initial fire mission is called and smoke rounds start landing, the FIST officer in his track will adjust the smoke to obscure the positioning of the support-by-fire elements, and to facilitate the attach to Objective Grant.

Clear. FM 71-1 lists critical tasks in the clearance part of a defile operation as:

● The infantry conducts clearance operations in concert with the BFVs or tanks. Combat vehicles provide a base of fire to protect infantry elements as they clear an area. The infantry stops at a designated point or terrain feature where observation is affected; it provides a base of fire to allow the vehicles to bound to a new support-by-fire position. This cycle continues until the entire area is clear.

● BFVs may be better suited than tanks to support the movement of the infantry in defiles and in urban areas with multiple-story buildings. This is the result of the BFV's ability to elevate its main gun to an angle of +60 degrees (an M1-series tank can only elevate to +20 degrees). Tanks, however, are very effective in destroying bunkers and other fortified positions; they can also neutralize and/or penetrate ground-level floors in buildings, providing the infantry with support and access to this type of restricted terrain.

● Within the restricted area, tanks should be brought forward only to accomplish specific missions that are within their capabilities. Factors that may limit the usefulness of tanks in clearance operations include the following:

- Short engagement ranges, which may be prevalent in these operations.

- Limitations in elevating the main gun.

- Significant blind spots associated with targets above the tank.

● At the same time, tanks have more effective armor protection than do BFVs and thus have greater survivability. They can also provide cover for infantry elements that move behind them when crossing danger areas.

● Direct fire plans should cover responsibility for both horizontal and vertical observation and direct fire.

● Infantry squads should clear a defile from the top down and should be oriented on objectives on the far side of the defile.

● Dismounted engineers with manual breaching capability should move with the infantry. Additionally, engineers should move with the overwatching vehicles to reduce obstacles.

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- During the clearance process, tanks and BFVs may be required to operate in direct support of infantry elements.[3]

Slowly the team moves toward CP8. The dismounts move through the cover of thick pines to where they have observation into the bowl surrounding CP54.

Red platoon and the dismounted infantry ensure the wood line on either side of the CP is clear. The three remaining Bradleys cover the movement of the dismounts up to CP8. A brief firefight ensues as the northern dismount squad makes contact with a possible OPFOR forward observer team. With the help of Red 6 and deadly HE rounds, the enemy dismounts are killed, eliminating the enemy eyes on CP8. The Bradleys push forward to find good support-by-fire positions south of CP8 while the dismounted infantry assists in guiding the White platoon tanks into positions north of CP8. A quick scan of the valley reveals no enemy and no visible obstacles. Smoke begins to build as the linear smoke target (20-minute duration) lands.

Things now move rapidly for Alpha Team. Red and White platoons are set in two support-by-fire positions on either side of the defile, orientating toward the objective. The movement of the tanks into their positions, guided by the dismounted infantry does not go unnoticed. A BMP begins to engage White 6. Tracer rounds ricochet into the sky as rounds land short of the tank platoon. White 8 turns his flank toward the BMP as he tries to maneuver and feels rounds slap against his side, tearing the track off the road wheels. Screaming at his gunner to traverse left, White 8 pops his onboard smoke grenade launchers to cover his disabled tank. Quickly the gunner lays on the BMP as it backs up toward the wood line. "Identified!!!," screams White 8's gunner. "FIRE!!!!," yells the TC. Immediately, White 8 Golf (gunner) shouts, "ON THE WAYYYYY!" and depresses the triggers on the Cadillac, launching a 120mm SABOT into and through the BMP. Its turret spins 20 feet in the air as the hull bursts into flames.

Alpha 5 and the FIST-V maneuver into the wood line to get a better view of the valley. With eyes on the bowl, the FIST begins to shift the smoke to better accommodate the assault. "Alpha 6, White 7. Engaged and destroyed one BMP. White 8 is a mobility kill. Slant 4,

over." "Alpha 17, Alpha 6. Give me a status on the smoke over." "Alpha 6, Alpha 17. We have 10 more minutes of smoke left. Providing good concealment from CP54. Recommend launch assault in 5 minutes, over."

"Patience," Alpha 6 thought. Knowing enemy artillery would start blanketing his support-by-fire positions at any time, possibly cutting off his assault force positioned approximately 300 meters on the western slope of CP8. However, a number of painful experiences were fresh in Alpha 6's mind about not having the conditions sets prior to an assault through the defile. It was like balancing on the edge of a canoe. Too far in either direction could cause you to go in the deep end. "All Alpha Elements, Alpha 6. Red and White, continue to lay suppressive fire. Blue, start your assault when artillery impacts on Objective Grant. Alpha 17, fire targets AE2020 and 2021, over."

Like a conductor, Alpha 6 was setting the conditions for his assault. With his support-by-fire positions in place covering suspected enemy positions, his assault force in place, smoke obscuring the defile from direct enemy observation, and suppressive fires about to land on templated enemy positions, Team Alpha was ready.

Secure. Team Alpha was entering the secure phase of the defile operation. FM 71-1 gives possible actions a company team must prepare for prior to securing the far side of the defile:

- Within the capabilities of the company team, assault to destroy enemy forces and secure the far side of the restricted terrain.

- Maneuver mounted elements to establish support-by-fire positions on the far side of the restricted terrain.

- Conduct support-by-fire to protect the deployment of the follow-on force that is assuming the fight, or destroy or suppress any enemy elements that threaten the task force as it exits the restricted terrain.

- Defeat any counterattacks.

- Protect the obstacle reduction effort.

- Maintain observation beyond the restricted terrain.

- Integrate indirect fires as necessary.[4]

After five long minutes pass, Red and White have identified one more BMP

and are engaging with direct fire. Where is the T-80? Finding its position is the linchpin of the assault. Knowing he is down to 5 minutes of smoke and his luck with enemy artillery is not going to last much longer, Alpha 6 launches the assault. "Blue 7, Alpha 6. Assault, time now!"

Blue immediately begins their move. No fancy maneuver yet, just simply armored speed to get through the defile, out of the kill zone. Like infantry soldiers clearing a room, Blue 6 knows he needs to get out of the "fatal funnel" as fast as possible. As Blue crests CP8, White 6 reports contact with the second enemy BMP.

White 6 notices too late the lone BMP creep out of the woods again and launches an antitank missile toward his tank. Screaming "SAGGER!" to his crew, White 6 grabs the TC override and attempts to bring the main gun on the BMP. His driver, hearing the traditional command to begin evasive maneuvers, tries to lurch forward only to hit a large tree with the traversing gun tube. White 6 watches in horror as the antitank missile flies closer and closer until a shower of sparks flies from the White 6 tank. White 7 was already directing his gunner on target when he notices the antitank missile slam into his platoon leader's tank. Giving the fire commands, he watches with grim satisfaction as his uranium depleted SABOT round slices through the enemy BMP. "Alpha 6, White 7. Engaged and destroyed second BMP. Slant 3, White 6 is down. Alpha 7, meet me A&L." White 7 was meeting the company first sergeant on the company's internal administrative and logistics net to give a grid to direct the medics to White 6's tank.

Alpha 7 briefs the maintenance and casualty plan during the company OPORD. Using each of the company personnel carriers (PCs), the first sergeant develops a casualty evacuation (CASEVAC) plan, which gives a dedicated CASEVAC vehicle to each platoon. The medic track, with the most medical experience aboard, is assigned to the platoon expected to have the most casualties. In this case, White platoon was anticipated to have the most casualties. The first sergeant's PC and the maintenance PC were already preconfigured with litters to accommodate casualties. The first sergeant was assigned to cover Blue platoon and the

"The support-by-fire elements plaster the T-80's area with machine gun fire and main gun rounds. Bradley 25mm rounds arch around the T-80 as ranging shots are quickly followed by 3-round bursts. The T-80 commander has years of experience fighting on this terrain and knows exactly where to maneuver for a good shot. He has his driver ease up into an old half-filled-in fighting position and glances through is binoculars. "

maintenance PC was ready to evacuate any casualties from Red platoon. By using an internal administrative and logistics (A&L) frequency, the requests for medics, grids of damaged vehicles, and maintenance reports do not tie up the company net during a fight. "All Alpha Elements, Alpha 6. Be on the lookout for that T-80. Alpha 6 out!."

Alpha 6, following behind his assault platoon, clears the intervisibility line and has eyes on Objective Grant. There's the smoke screen. Blue advances toward PL New York. Still no contact. Once Blue reaches PL Florida, the platoon will turn south and attempt to assault Objective Grant from the rear. Loader's keep a vigilant watch for air threats as the tanks continue to speed past the objective. TCs and gunners strain to locate any enemy vehicles in their sectors of observation amid the bouncing of man and steel. Suddenly... "Contact T-80 vicinity CP54 OUT!"

"Well at least we know where it is now," thought Alpha 6. Soon the northern support-by-fire position is attempting to destroy the T-80 with direct fire. Alpha 17 calls a shift for AE2020 attempting to get raining steel on the T-80. Through wisps of smoke, Alpha 6 catches a flash of the T-80's 125mm main gun. Blue continues to move toward its turning point. Blue 7 is continually on the net giving front line traces. Soon Blue platoon calls out "Phase Line Florida," and the tanks immediately wheel toward the Objective.

The support-by-fire elements plaster the T-80's area with machine gun fire and main gun rounds. Bradley 25mm rounds arch around the T-80 as ranging shots are quickly followed by 3-round bursts. The T-80 commander has years of experience fighting on this terrain and knows exactly where to maneuver for a good shot. He has his driver ease up into an old half-filled-in fighting position and glances through is binoculars. There! He spots an M2A2 maneuvering for a better position. Quickly he relays the location to his gunner and immediately a 125mm round flies into Red 7's Bradley. "Alpha 6, Red 6. Slant 2. Lost Red 7 to the T-80. Continuing to suppress, over." "All Alpha elements, Alpha 6. Be advised Blue is closing in on CP54, time, now. ID all targets. 6 out." "Alpha 6, Alpha 5. We have eyes on you and Blue. We'll cover."

"Good," thought Alpha 6. At least the team can see... "CONTACT FRONT!!," screams Alpha 6's gunner. Before he could key the mike, Alpha 6 hears three simultaneous explosions as Blue platoon executes a near-perfect contact drill. Three 120mm SABOT rounds tear through the air, striking the T-80 in less-than-a-quarter second, obliterating the enemy tank and crew. Blue continues to sweep through CP54 finding no more opposition. Apparently, only one T-80 and two BMPs defended this position. The team commander keyed the mike to report to his battalion commander. "Dragon 6, Alpha 6. CP54 se-

cure. Blood count 1/3/1/1. Slant 9/2, over." "Alpha 6, Dragon 6. Roger. Stand by for FRAGO. Good job, out."

Alpha 6 already knows that his first sergeant is coordinating the evacuation of the wounded and the maintenance team is checking on damaged vehicles. Gazing back at the dissipating smoke toward CP8, Alpha 6 remembers an old "Willie and Joe" cartoon. Thinking aloud, "There we were and here they wuz!" With much of his combat power intact, Alpha 6 begins setting up his hasty defense in case of an enemy counterattack. By following the rules set in FM 71-1, and bending some to his advantage, Team Alpha successfully assaults through a defended defile.

Hopefully this article will assist armor leaders in planning, preparing for, and executing a defile drill. Think outside the box to win! Good hunting tankers!

Notes

[1]U.S. Army Field Manual 71-1, *Tank and Mechanized Company Team*, U.S. Government Printing Office, Washington, D.C., 26 January 1998, chapter 3, section 6.

[2]Ibid.

[3]Ibid.

[4]Ibid.

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Training Transformation to Future Combat Systems (FCS)

by Clyde T. Wilson

As an integral part of the U.S. Army, Armor and Cavalry are transforming to meet the realities of the post-Cold War era. At the end of World War II, Germany and Japan did not have a problem producing aircraft, however, they could not produce trained and experienced pilots. The Army will face the same dilemma with the FCS unless it develops and institutes a personnel acquisition and training strategy to support the Objective Force. The research and development for the Objective Force is proceeding with an emphasis on organization and equipment. The trend toward flatter organization, joint integration at a low level, automating traditional human functions, and increasing task load raises significant training issues for the U.S. Army Training and Doctrine Command (TRADOC) as the Army transitions to the Objective Force.

The current digitization effort in the Army is only the first wave. The Army has applied signal and computer technology to automate its command and control processes. This has not changed the fundamental way we prosecute direct fire combat, but it allows us to speed up the decision cycle and share knowledge among the force.

The second wave of digitization will be quite different. This wave will change the way we fight at the basic level, and require us to take a fundamental look at how we train. Current tank design balances survivability, mobility, and firepower. Technology has changed tank engagements dramatically during the past 20 years. The technology advances that have taken us from infrared/white light searchlight/mechanical range finders to thermal sights/digital range finders is a trend that will continue. In the future, firepower advances (smart/brilliant munitions) and information technology will decrease the requirement for armor protection. Digital networking will provide direct links from a variety of sensors to the shooter, placing new skill and tasks requirements on soldiers. In the future, our leaders will have to have as much skill at reading digital displays as they do reading a topographic map. Brilliant antitank, X-band, and side-looking radar will be as much a part of the frontline warfighter lexicon as dual-purpose improved conventional munitions, SABOT, and final protection fires are today.

Today's basic course student will serve in first-wave units and command second-wave battalions. The fundamentals of digital warfighting need to be incorporated into current Armor School courses — not the operator/machine specific detail, but the current theory and future trends of our developing Army. Just as

"Selection for service in an FCS organization will require a detailed screening process... The selection process should include a significant emotional event, such as hell week during SEAL training, where candidates are tested for physical stamina, intelligence, motivation, dedication, and aptitude prior to expending expensive training resources."

it is important for a company commander to understand the fire support system that supports him to adequately plan an operation, future commanders must have an understanding of the sensors and array of precision weapons that will support them.

FCS soldiers will have the reconnaissance skills of a scout, coupled with the target engagement skills of a fire support element in a complex joint environment.

Personnel acquisition and training the Objective Force may require a fundamentally different approach from the current Armor branch model because additional tasks will be placed on Armor soldiers. The Special Forces branch may provide insight.

Special Forces rely on the general Army population as a recruiting pool. Personnel with airborne or ranger training are prime candidates. This reflects not only the skill required of Special Forces soldiers, but conveys the requirement for experience, maturity, and demonstrated performance.

Selection for service in an FCS organization will require a detailed screening process. The issue is defining the entry requirements. The Army would not waste resources sending officers to flight school if they are colorblind. The selection for FCS cannot be one of drawing the line based on available personnel resources, but by setting a minimum standard. The selection process should include a significant emotional event, such as hell week during SEAL training, where candidates are tested for physical stamina, intelligence, motivation, dedication, and aptitude prior to expending expensive training resources.

A large portion of FCS training will necessarily be conducted in simulation. The nature of joint, network centric warfare makes live fire training, at any level, resource restrictive. Live fire gunnery for the Objective Force, using joint precision weapons, will have a much greater cost than current tank gunnery. Conduct of fire trainers (COFT) will have to be developed to train crews on full-spectrum engagements that they will be required to conduct. Virtual and constructive training support packages will be required to train collective skills. All of this is additive to the live training that will include tactical skills, self-protection, leadership, battlefield stress management, and survival, evasion, resistance, and escape. The requirements

for an FCS training area will require both a fixed tactical internet and a higher simulation architecture that allows the simulated employment of precision non-line-of-sight weapons. The institutional training strategy will have to produce soldiers, leaders, and staff officers capable of operating in a joint environment when they report to the unit.

TRADOC is adept at developing traditional training products such as soldier training publications, mission training plans, and programs of instruction. Field commanders take these products and apply mission essential task lists to develop tailored training programs. TRADOC uses a similar process and a common training scenario to focus institutional training. For example, the Fulda Gap scenario was not as much about fighting in the Fulda Gap as it was about providing a model for fighting a significant modern armored threat on short notice in a mature theater. U.S. forces were forward deployed with little or no asymmetric threat. At a strategic level, the intent was to deter attack and if attacked, successfully defend while being prepared to escalate to tactical nuclear or strategic nuclear warfare. During the Cold War, the Army trained other scenarios, but the Fulda Gap scenario represented the clear priority for training the heavy force. The National Training Center and professional development courses used the Fulda Gap template adapted to local terrain to train. The Gulf War, in many ways, conformed to the Fulda Gap scenario.

The nation now faces a new reality embodied in the Caspian Sea scenario. The Caspian Sea scenario is not about fighting in the Caspian Sea area, but is all about the next most dangerous situation U.S. forces are likely to face. In many ways, it follows the 1950-53 Korean War scenario. Country A (South Korea) is attacked by Country B (North Korea). The U.S. comes to the assistance of Country A. The thrust of the scenario is how does the U.S. enter the battle area and build-up sufficient forces to achieve its national goals. The scenario is further complicated by Country C (China), which threatens to enter the conflict, especially during the build-up phase when the U.S. is most vulnerable.

The Korean scenario provides national decisionmakers with significant geopolitical issues. The situation becomes more complicated when adding an asymmetric threat like we saw during Vietnam. The Caspian Sea scenario is about getting credible force into the area of operations and deterring aggression by Country C. In the scenario, the arrival of U.S. heavy forces represents endgame. At this point, we dominate the battlefield. After heavy forces arrive in the area, they must be prepared to conduct combat operations against the heavy threat presented by Country C while providing self-protection against an asymmetric threat that specifically targets U.S. vulnerabilities.

TRADOC should produce a detailed training scenario that clearly illustrates the missions, roles, and functions of the organizations that TRADOC is responsible for training. This will allow training centers and schools to gear training toward specific unit responsibilities within the scenario. Early entry forces, such as an Airborne brigade or an Interim Brigade Combat Team, focus on the beginning of the scenario, while heavy forces focus on the latter portion of the scenario.

The transition to the Objective Force requires a deliberate front-end analysis that will define the doctrine, training, and personnel acquisition implications for the Army. This analysis, in conjunction with force-development efforts, is critical for focusing resources and accelerating the U.S. Army's transition.

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numerous squadron-level field training exercises, several digital command and control rehearsals, two Army Warfighter exercises, Millennium Challenge 2002 (NTC rotation), weekly digital staff training and monthly squadron command post exercises, and integration of ABCS into daily squadron operations. Although all of the mentioned TTP may not apply to all reconnaissance (or digitally equipped) units, they may provide some proven techniques for increasing staff and digital skills proficiency.

As the Army's first medium-weight reconnaissance squadron and its parent unit, the SBCT, begin executing the final phases of transformation, several valuable lessons have been learned in regards to leveraging digital systems to support the MDMP. Equally important has been the lessons learned on how these systems enhance ISR planning and execution. It is no longer a question of *why* the Army needs to transform, it is the fact that the Army is executing transformation now that should drive all leaders to become educated on the use of digital systems and ISR operations — as they both will play a significant role in enabling future combat operations.

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Sharpsburg:
17 September 1862

by Captain Jared Sutton

General Robert E. Lee's Army of Northern Virginia slipped across the Potomac River on 4 September 1862. Their movement had gone unobserved by Federal forces, thanks to the deft screening operation conducted by General J.E.B. Stuart's cavalry. Their immediate aim was to bring the war onto Union soil and relieve the pressure on the Confederacy. In the long term, the Confederacy hoped to conduct a successful campaign in Federal-held territory, culminating in the decisive defeat of the Army of the Potomac and European recognition for the Confederacy as a legitimate government. Unknown to either side, this campaign's outcome would have great and far-reaching implications for the remainder of the war. The Maryland Campaign had begun.

At the start of the campaign, the Army of Northern Virginia numbered about 50,000 men and 230 guns. The army was poorly clothed, badly equipped, short on supplies, lacked proper transportation, and was underfed.[1] To conduct operations in Union territory, the army would have to sustain itself by foraging and capturing supplies from Union troops and supply depots. Proper footgear for the Confederate infantry was in shortest supply. Despite conducting an invasion of Union territories, most of the Army of Northern Virginia did not have shoes on their feet prior to crossing the Potomac River. The Confederacy did enjoy a distinct advantage in organization and leadership.

On paper, the largest formation of troops authorized by the Confederation was the division. However, by early 1862 the Army of Northern Virginia was beginning to adopt a 'corps-like' level as well. Without proper legislation by the Confederate government, Lee was unable to form a proper corps with appropriate command and staff. That, however, did not stop the Army of Northern Virginia from achieving the next best thing.

It was common practice for two or more Confederate divisions to be grouped together and commanded by the senior division commander present. This system allowed Lee two advantages over the Army of the Potomac. First, it offered Lee the ability to observe who could effectively command at corps level and higher. Second, it offered him the ability to replace commanders that could not handle corps command, or commanders that were not aggressive or competent division-level commanders. In short, the Army of Northern Virginia was organized into 'commands' rather than formal corps. This may explain why the Confederacy was able to shift their combat power to counter Union attacks so quickly.

Contrast that with the organization of the Army of the Potomac. After a Union defeat at Second Manassas (Second Bull Run), Major General George B. McClellan was placed in command of all Union forces in the Washington, D.C. area. This included his old command, The Army of the Po-

"In the long term, the Confederacy hoped to conduct a successful campaign in Federal-held territory, culminating in the decisive defeat of the Army of the Potomac and European recognition for the Confederacy as a legitimate government. Unknown to either side, this campaign's outcome would have great and far-reaching implications for the remainder of the war. The Maryland Campaign had begun."

tomac, and the shattered elements of Major General John Pope's Army of Virginia. Having received orders from Washington to repel any attempts by the Confederacy to invade the North after their success at Second Manassas, McClellan combined the two Union armies under the Army of the Potomac on 5 September 1862. Complicating matters for the Union was the fact that three of the six Union Corps commanders had never fought at that level. Additionally, Major General Fitz-John Porter and Major General William Franklin, both experienced corps commanders, had been relieved of their commands until completion of an investigation concerning charges of disobedience at Second Manassas. The Army of Northern Virginia also enjoyed an advantage in organization.[2]

Dating from the Mexican-American War, artillery, and to a smaller extent cavalry, had been distributed unevenly at the brigade level. It was not uncommon for a brigade to have a cavalry troop or artillery battery as part of its organic makeup. Additionally, uniformity of organization and equipment between brigades of the same division was rare. Lee recognized the inherent weakness of this system and began to reorganize the artillery arm. He took the batteries away from the individual brigades and organized them into a single battalion under a division artillery commander. An additional battalion was made available for 'corps use,' and another battalion as an artillery reserve for the army. However, by the time of the engagement at Sharpsburg, only Major General James Longstreet's corps had received additional artillery.[3] By organizing his artillery in this manner, Lee was able to focus and mass his fires at critical times and places during the battle. These artillery reserve battalions were free for the division or corps commanders to maneuver in support of the local fight. This reorganization of artillery enabled Confederate artillery to achieve effects in the counter-battery fight, despite inferiority in equipment and numbers to union batteries.

HARMON

Union artillery had the advantages in both technology and numbers. Having a heavy industrial base was the key to having modern guns and weapons found in European armies. The bulk of the Union artillery was fielded with the 12-pound Smooth-Bore Napoleon.[4] It fired a 12.3-pound solid shot to a range of 1,619 yards at 5 degrees elevation, was reasonably accurate at all ranges, and could maintain a high rate of fire for longer periods than most field pieces of the day. The Smooth-Bore Napoleon also fired canister shots with a devastating effect.[5] In contrast, the Confederacy was equipped with a Mexican-American War vintage piece — the M1841 6-pound gun, which fired a 6.1-pound solid shot at 5 degrees elevation to 1,523 yards.[6] The M1841's main limiting factor was it did not produce the casualties that more modern pieces could achieve.[7]

For the cavalry arm, Lee also made changes. Upon taking command, the Army of Northern Virginia had 10 cavalry regiments that were organized into a single brigade. They would quickly be reorganized into a separate division under the able leadership of General J.E.B. Stuart. This organization would continue to grow over the course of the war into a full corps.[8] This full, independent cavalry division gave Lee the ability to cross the Potomac River unchallenged and begin his invasion of Maryland.

Lee's invasion of Maryland was in stark contrast to the defensive war strategy that had been carried out thus far by the Confederacy.[9] There are two main reasons for the invasion of

Maryland by the Confederacy. First, Lee's success at Second Manassas created a windfall morale and pride in the Confederate military. What better time to invade the enemy's home than when he had been decisively defeated abroad? Such an invasion of the Union would also relieve northern Virginia where much of the fighting had been conducted thus far. There was also the belief among Confederate leaders that the Union did not have the will to carry out a prolonged destructive war. If the Confederacy could invade the North and place the burden of the war on Federal territories, the Union's will to fight would fall and the Confederacy could win independence.

Second, there was a political reason to invade Maryland. There were strong feelings of state's rights among Maryland citizens. These political feelings were so strong that early in the war Federal troops quickly marched south and occupied Maryland to keep it from seceding from the Union. Lee had hoped that by invading Maryland, some local support could be generated and Maryland would enter the war on the Confederacy's side. Disappointing for Lee, he received only a lukewarm response from the citizens of Maryland.

There was also the consideration of European intervention. For the length of the war, the Confederacy had courted both England and France to recognize the legitimate right of Confederate independence. A Confederate victory on Union soil would strengthen the Confederate claim, and perhaps win Confederate independence by bringing Europe into conflict

with the United States.[10] With his goals set, Lee crossed the Potomac River on 4 September 1862.

Once across the river, Lee rested at Frederick, Virginia, for 2 days. Lee did not believe that the Federal army would move on him for 3 to 4 weeks. With this estimate in mind, Special Order Number 191 was drafted. It would order Major General Thomas J. 'Stonewall' Jackson's corps to take his command back across the Potomac and march on the Federal armory at Harper's Ferry, destroying as much of the Baltimore and Ohio (B&O) Railroad as possible. Major General Lafayette McLaws, with two divisions of Longstreet's corps, would move to Maryland Heights overlooking Harper's Ferry. Brigadier General John C. Walker would take his division of Longstreet's corps and march south to destroy the Chesapeake and Ohio canal aqueduct, and cross back over the Potomac into Virginia and occupy the Loudoun Heights overlooking Harper's Ferry. The remainder of Longstreet's corps would proceed northwest to Harrisburg, followed by General D.H. Hill's division and Stuart's cavalry providing rear guard. Once Harper's Ferry had been reduced, Jackson, McLaws, and Walker would rejoin the main command at Boonsboro, Maryland. Movements were set to begin on 10 September.

Much to the credit of the Army of Northern Virginia's staff, Special Order No. 191 was clear and unmistakable. Unfortunately for the Confederacy, two copies were delivered to D.H. Hill's division. He received one order directly from Army headquarters and a second copy from Jackson, the 'corps commander.' This being the only disadvantage to the informal command structure that Lee's army possessed. One of these copies would be lost during the march. Two Union soldiers who would understand the importance of their find immediately would later pick up the lost copy. Eventually, Special Order No. 191 would be delivered to the hands of McClellan.[11]

Understanding the importance of the discovery, McClellan made plans to defeat the Army of Northern Virginia while it was divided. He would strike with his left and center wing at Boonsboro and defeat both Lee and Longstreet. McClellan's left wing would then march south and strike Buckeystown and cut off the Confederate line of retreat. However, McClellan would not strike fast enough. His order delayed movement until the morning of 13 September.

By this time, Lee had detected McClellan's movements and had given orders to his subordinates to delay the Union approach through key passes around South Mountain. D.H Hill's division turned back to defend Turner's Gap. From the south, McLaws detached part of his force to defend Crampton's Gap. These two passes were key terrain that allowed the Union army to mass on the confederate position. Despite determined Union efforts to break through the passes, they would not control the passes until the morning of 14 September. This would prove operationally too late for the Union. Their chance to defeat the Army of Northern Virginia in detail vanished.[12]
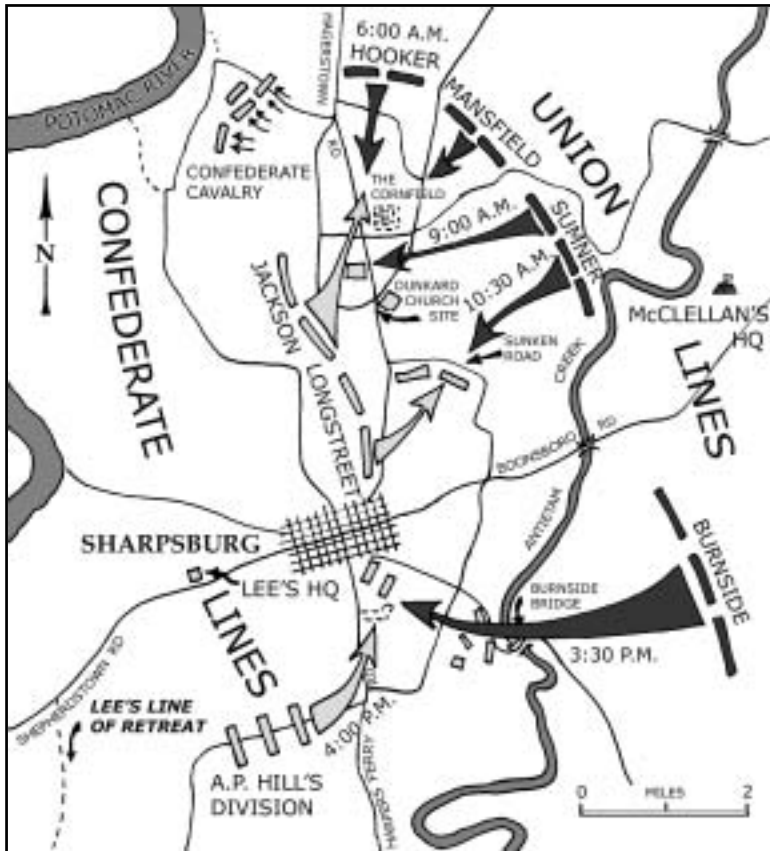
Map 1. Antietam Battlefield, 17 September 1862

Lee knew that McClellan was pushing troops through South Mountain as fast as he could. Fortunately for Lee, the pace was very slow. Lee made the decision to end the campaign early, cross back over the Potomac, and head to Harper's Ferry to linkup with the rest of his army. By the afternoon of 15 September, Lee stood on the banks of the Potomac near the town of Shepherdstown. The first news of Jackson's corps would reach him there. A messenger would bring word that Jackson had reduced the garrison at Harper's Ferry, had finished loading supplies, and was marching toward Sharpsburg to rejoin Lee.[13] At this point, Lee made the fateful decision to engage McClellan at Sharpsburg with his back toward the Potomac River. During the day on 16 September, both armies built up their combat power — McClellan's 97,000 soldiers would match Lee's 50,000 soldiers. By the morning of 17 September, the battle at Sharpsburg would begin.

McClellan's plan for the morning was a three-phased attack. The first phase was an attack with three corps in echelon: Major General Joseph Hooker, Major General Joseph Mansfield, and Major General Edwin Sumner in the north to fix Jackson's position on the Confederate left and draw out the reserve. In the far south, Major General Ambrose E. Burnside would launch phase two with an attack after Sumner's corps was engaged. His corps was tasked with destroying Confederate General D.R. Jones's brigade at Sharpsburg, and cutting off any line of retreat open to the Confederates. The final stage was an assault on Longstreet in the center of the Confederate line once both ends were fixed. This final assault would envelop the Confederate line already overwhelmed by the first two assaults.[14] What would happen on the outskirts of Sharpsburg, near Antietam Creek, was far different than what McClellan had envisioned the day before.

At 0543 hours on the morning on 17 September, Hooker's corps attacked the Confederate's extreme left. Hooker attacked with two divisions abreast, with his reserve division following in support in the center. The attack was conducted over open ground, with a single cornfield providing the only concealment on this portion of the battlefield. The Federals made contact with the Confederates at about 0615 hours. Jackson's corps had taken up position in the cornfield. The Federal assault drove both Confederate divisions back, and left the Union in control of the cornfield for about 45 minutes. Lee realized the danger on his left flank, so he ordered reserve formations to march to Jackson's aid. By 0700 hours, Jackson had his reinforcements and committed his reserve division of Brigadier General J.B Hood's Texans to retake the cornfield. After a bitter set of engagements, including a fierce fight with Brigadier General John Gibbon's Iron Brigade, the cornfield was retaken for a time. Hood managed to stabilize the Confederate line. At the same time that Hood made his attack, the second Union corps was committed. After being briefed by Hooker of determined Confederate resistance and a savage counterattack, Mansfield's attack was slow and cautious. In moving into position just east of Hooker, Mansfield was shot by one of his own men and died of the wound. Brigadier General A.S. Williams replaced Mansfield and was ordered by Hooker to continue the attack toward Dunkard Church. The assault was conducted in the open and with inadequate support. Williams was able to reach Dunkard Church by 0800 hours, but was unable to push any further into Confederate lines. He was forced to halt and reorganize. Effectively, the engagement north of Sharpsburg was over.[15] The next set of engagements would happen in the Confederate center.

Major General Sumner's II U.S. Corps would reach the heavy fighting north of Sharpsburg at 0900 hours. Roughly

In this fall, 1862 photo, President Lincoln meets with General George B. McClellan at Antietam.

"The following morning, Lee would cross the Potomac unopposed for the relative safety of Virginia. It would be the bloodiest single day in American history with more than 26,000 casualties in less than 14 hours of fighting. For the South, it would be a disappointing experience. They would not get the support they sought from the people of Maryland. Neither did they get the decisive victory over the Union that might have brought European recognition. Instead, the Confederacy was lucky to escape with their army intact. Lee had narrowly avoided complete destruction of his army."

the same time, two divisions were sent by Lee to reinforce the left wing. One division was Walker's division, pulled from the extreme right. The other division was McLaws division, Lee's only remaining reserve formation. They advanced on Sumner's attack with McLaw supported by Walker. The Confederate counterattack struck Sumner in the right flank and drove him back in disorder. The Federal VII Corps would arrive at 1000 hours to reinforce Sumner's right flank. They would find little resistance and request two times — once to Hooker and then to McClellan — to assault the Confederate lines. Both times they would be denied because they were the Union reserve to be held to prevent a Confederate counterattack. Had the attack been authorized, VII Corps would likely have met little organized resistance and penetrated all the way to the Confederate's rear.

The remainder of Sumner's corps was involved in fighting for Bloody Lane against Longstreet's corps. Bloody Lane was the name given to a sunken road that ran almost the length of the Confederate center. From this position, D.H Hill and Major General Richard Anderson's troops enjoyed the cover of this natural trench line. These divisions were placed in the Bloody Lane because they had been heavily attrited during the engagements at South Mountain.

The Union initially attacked with two divisions abreast. Their assault stalled just short of Bloody Lane. Union artillery was unable to suppress confederate positions in the sunken road. Conversely, Union formations suffered greatly under the assault of both Longstreet's corps artillery, and fire from Confederate positions in the sunken road. The Confederates unsuccessfully launched a counterattack to drive the Union back from the sunken road. Ultimately, the Union gained a foothold in the southern portion of the sunken road. From this position, federal forces enveloped the Confederate line, forcing the rebels to withdraw. The Confederates launched a single counterattack aimed at retaking the sunken road, but failed to dislodge the Union.[16] By 1300 hours, fighting in the Confederate center had stopped. At the same time, the final assault of the day was beginning in the south, Major General Burnside was crossing Antietam River.

Burnside had received orders to cross the river at 0800 hours. He did not begin his movement until 1000 hours, and did not get his first regiment across until 1300 hours. Burnside was ordered to carry the bridge, which he took literally. Burnside claimed his tardy assault was the fault of his orders that specified he was not to attack until given further orders. He did not bother to see that the river was fordable in many places. He was opposed on the far side by a single brigade, who overwatched the bridge and made the crossing a costly

affair in casualties. Once across the bridge, Burnside would stop to reorganize his corps. This would cost the Union another 2 hours.

Burnside would start his assault on Sharpsburg at 1500 hours, in just enough time for Major General A.P Hill's division to arrive from Harper's Ferry. In another fortuitous event, Hill would counterattack Burnside's corps on the left flank, stopping the Union assault. The engagement at Sharpsburg was over.[17]

The following morning, Lee would cross the Potomac unopposed for the relative safety of Virginia. It would be the bloodiest single day in American history with more than 26,000 casualties in less than 14 hours of fighting.[18] For the South, it would be a disappointing experience. They would not get the support they sought from the people of Maryland. Neither did they get the decisive victory over the Union that might have brought European recognition. Instead, the Confederacy was lucky to escape with their army intact. Lee had narrowly avoided complete destruction of his army.

For the Union, it provided the necessary victory that President Abraham Lincoln needed to give his Emancipation Proclamation. The Proclamation was a defunct order by a politically brilliant president that freed all slaves in Confederate territory, where the Union had no control, and left slaves in the Border States in bondage. The true purpose of the Proclamation was to change the focus of the war from Union preservation to one of antislavery. Its effect was to keep the British from entering the war on the side of the Confederacy by politically eviscerating the Confederacy in

world opinion. After the Emancipation Proclamation was issued, any nation providing support to the Confederacy was endorsing slavery. The British, deeply involved with anti-slavery operations off the coast of Africa, were unwilling to tie their public image to the Confederacy and withdrew any overt support. Sharpsburg represented a missed opportunity to destroy the Army of Northern Virginia and end the war early. Had McClellan's plan been executed as he envisioned, the War of Secession may have ended much sooner.

It is hard to say what caused McClellan to miss the opportunity to end the war early. Almost all the factors were stacked in his favor. Organization and leadership aside, McClellan had the largest most modern army, was fighting on his own soil, and held the largest trump card — the perfect read on the enemy with Special Order No. 191.

Perhaps the largest problem plaguing the Union during the Maryland Campaign was the lack of initiative. McClellan's education as an engineer showed through his military experience. By delaying the attack until all his assets were properly in place, McClellan unconditionally surrendered the initiative to the enemy despite being privy to his operational plan. Once McClellan had Special Order No. 191, he should have moved quickly with his forces to seize South Mountain ahead of the Confederacy. Once the passes were secure, McClellan could have passed the remainder of his forces through to seize Boonsboro and destroy the Army of Northern Virginia. However, McClellan resisted moving decisively throughout the campaign. Even with most of his army opposite the Confederate position outside Sharpsburg, McClellan refused to move until his vanguard units repositioned from their engagements at South Mountain. This delay allowed Lee to dramatically increase his fighting potential by giving Jackson time to march into position from Harper's Ferry.

The greatest failure of the Maryland Campaign from the Union side is its failure to conduct a coordinated attack on the Confederate position. As already mentioned, the lack of experience at corps-level leadership may have caused difficulty in coordinating the attacks on the Confederate position. More than half of the corps-level officers in the Union army had no experience in commanding large formations, which may have proved somewhat at fault for the disjointed operation carried out that September day. That, however, does not explain the hesitation that kept Burnside from crossing the Antietam and engaging, for some 5 hours, after Hooker launched his attack. Burnside was an experienced commander. It may be argued if he was a competent commander, but he was not new to command. Burnside himself said that he did not cross because he had conflicting orders that told him to remain unengaged until specifically ordered otherwise. Burnside's hesitation was likely caused by a failure to understand the commander's intent.

Even McClellan seemed to have difficulty with what he wanted his subordinates to do. He ordered the northern wing of the Army of the Potomac to engage Jackson's corps, followed by Burnside's attack in the south to block any line of retreat. Yet at the start of the attack in the north, Burnside claims he received orders to wait. By the time it was discovered that Burnside did not attack and a messenger was dispatched, it was to late. It was 5 hours later and Lee had time to reposition his forces.

There was also the interesting case of VII U.S. Corps. Upon arriving on the field, they discovered very little Confederate resistance in their zone and requested, from both Sumner and McClellan, to attack the weak Confederate position. Both times VII Corps was denied authorization despite the fact that McClellan originally wanted to push Burnside through what he thought would be weak resistance around Sharpsburg. It would seem that McClellan lost his chance to defeat Lee when the opportunity was presented in the north.

Had McClellan given clear guidance from the start of the battle on what he wanted his subordinates to accomplish, Burnside should have understood the plan. He would have waited until the Confederacy was heavily engaged in the north before beginning his attack. Burnside also would have known the trigger for the attack and would likely have not lost the initiative. Clear commander's guidance would have sent VII Corps forward into the Confederate line where it was weak, just as McClellan had intended Burnside to do from the south. In such a case, Burnside would have probably met VII Corps in Sharpsburg around noon. With the defeat of the Army of Northern Virginia, the Confederacy would have been forced to sue for peace much sooner.

Notes

[1] R. Ernest Dupuy and Trevor N. Dupuy, *The Compact History of the Civil War*, Warner Books, New York, 1993, p. 159.

[2] Jay Luvaas and Harold W. Nelson, *Guide to the Battle of Antietam*, University Press of Kansas, Lawrence, Kansas, 1996, pp. XII-XIV.

[3] Ibid.

[4] Curt Johnson and Richard C. Anderson Jr., *Artillery Hell: Employment of Artillery at Antietam*, Texas A&M University, College Station, Texas, 1995, p. 39.

[5] Ibid., p. 21.

[6] Ibid., p. 6.

[7] Ibid., p. 21.

[8] Luvaas and Nelson, p. XVI.

[9] Dupuy and Dupuy, p. 9.

[10] Ibid., p. 160.

[11] Ibid., p. 163.

[12] Ibid., p. 164.

[13] Ibid., p. 165.

[14] Ibid., p. 167.

[15] Norman Stevens, *Antietam: 1862*, Osprey Books, London, 1994, pp. 45-53.

[16] Ibid., pp. 61-72.

[17] Ibid., pp. 72-84.

[18] Ibid., 85.

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"Defending the Storehouse" by Jason Askew. Art courtesy Anglo Zulu War Historical Society, *www.anglozuluwar.com.*

BATTLE ANALYSIS:
The Battle at Rorke's Drift

by Captain Arch Ratliff III

Although the following analysis of the Battle of Rorke's Drift is presented in an after action review (AAR) format, with obviously fictional dialogue, the information that forms the basis of the analysis is factual and taken from the accompanying bibliography of texts.

Observer controller (O/C): "Good morning gentlemen, let's get started with our AAR for the battle at Rorke's Drift. We have the British army commander, the garrison commander at Rorke's Drift, the Zulu army commander, and the Zulu commander at Rorke's Drift all present. Let us begin with a review of the British army's mission. Lord Chelmsford."

British commander, Lord Chelmsford: "Our mission was to attack in zone to destroy the Zulu army's main body along the center axis of advance into Zululand to prevent the enemy from attacking settlements in Transvaal and Natal.[1]

"The decisive point of the operation was destroying the Zulu main body within the borders of Zululand. My intent was to advance into Zululand along multiple axis of advance from Transvaal and Natal to destroy the Zulu main body before we arrived at the Royal Kraal at Ulundi. Our advance along ma-

jor avenues of approach between Transvaal, Natal, and Zululand was meant to keep the Zulu army from conducting a counterattack into the two territories. The endstate desired was the destruction of the Zulu main body in Zululand, and to prevent enemy forces from conducting counterattacks into Transvaal and Natal."[2]

O/C: "Thank you. King Cetshwayo, please describe for us your mission and intent for your army."

Zulu King Cetshwayo: "My mission for the army was to defend in depth along the major avenue of approach from Natal to disrupt the center column's advance to Ulundi.[3]

"The decisive point of the operation was the attrition of the enemy heavily and quickly on Zulu soil. I realized early on that the British would move on Ulundi in an attempt to draw us out in an open fight. I also fully comprehended the logistics resources available to the British army, especially if the home government perceived us as a true threat to their colonial expansion. Therefore, my intent was to conduct a limited defensive campaign within the borders of Zululand aimed at atritting the British without appearing to be the aggressor. The endstate desired was to disrupt the

British center column prior to their arrival at Ulundi, to force a favorable resolution with the British government."[4]

O/C: "Thank you. Lieutenant Chard, please describe the situation at Rorke's Drift prior to the battle."

Rorke's Drift commander, Lieutenant Chard: "As an engineer officer, I was sent to Rorke's Drift to repair damage caused by the heavy traffic from the center column's crossing. The commander of the outpost, Major Spalding left for Helpmekaar on the morning of 22 January to help along the reinforcements promised us. Due to my seniority, he left me in charge of the outpost in his absence.[5]

"There were several aspects of terrain that I failed to consider during my initial estimate of the situation, until they became significant factors in the battle. I will refer to the accompanying sketch map (Map 1) throughout my description of the situation.

"The drift was located on the Mzinyathe River and was trafficable except during periods of extreme flooding. The outpost was approximately one-half mile from the crossing and consisted of two existing buildings converted into a hospital and a commissary storehouse.[6]

Sketch Map

REFERENCE

D.. door   W.. window

last line of defence

0   10   20   30   40   50 metres
approx. scale
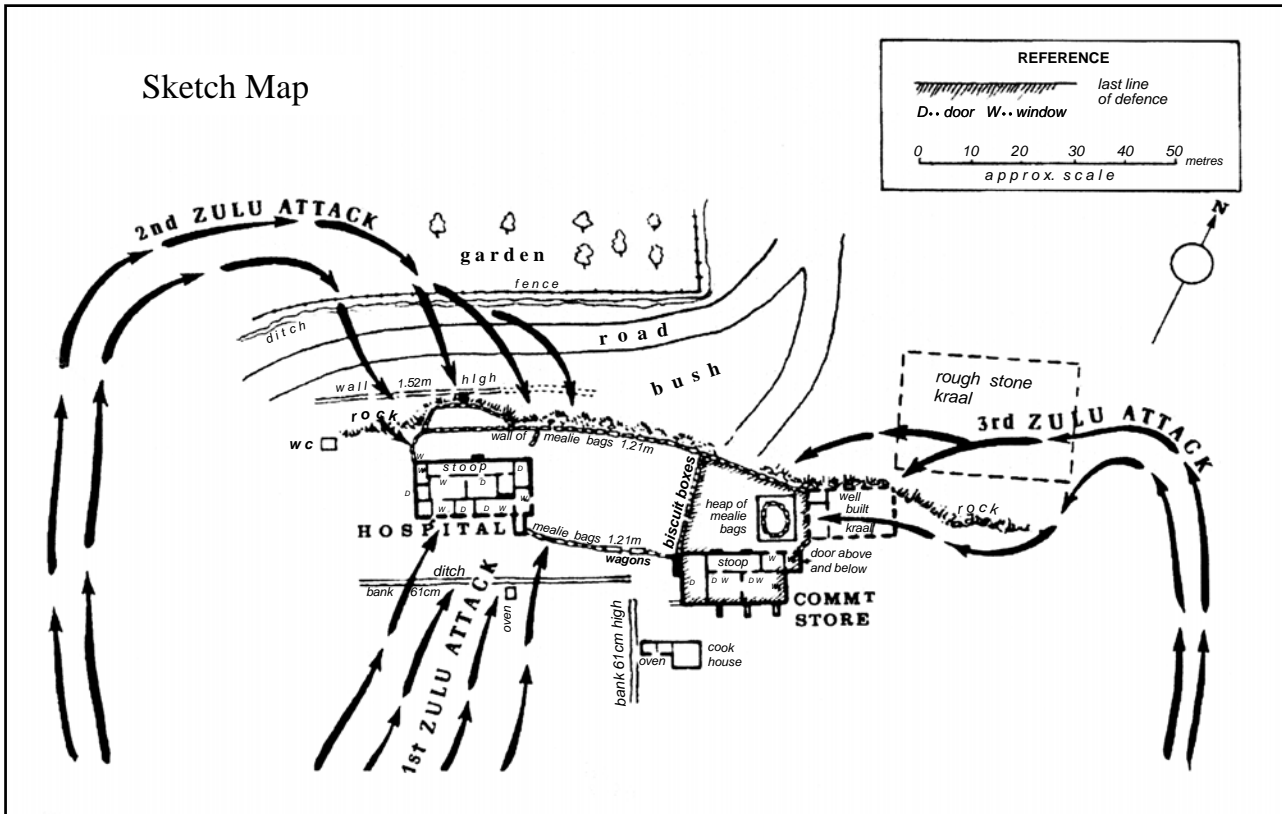
Map 1. The Defense of Rorke's Drift courtesy South African Military History Society, "The Anglo-Zulu War of 1879, Isandlwana and Rorke's Drift" by G.A. Chadwick, *Military History Journal,* Vol. 4, No. 4, December 1978, *http://rapidttp.com/milhist/vol044gc.html.*

"Not many natural obstacles existed apart from the Mzinyathe River to the north and Shiyane Hill, 500 meters to the south. There were, however, several man-made obstacles including a well-built stone kraal to the east that measured 17x10 meters, and a rough stone kraal northeast of the storehouse that measured 30x30 meters. A barricade of mealie bags formed a perimeter between the hospital, the storehouse, and the well-built kraal. Additionally, biscuit boxes stacked two-high formed a wall that divided the outpost into two sectors, the west sector that included the hospital and its large open yard, and the east sector that included the smaller yard, the storehouse, and the well-built kraal.[7]

"A line of rocks forming a 1.5-meter-high ledge was located 5 meters from the hospital running east to west across the entire length of the outpost, providing excellent cover for the enemy. The mealie bag barricades were erected along the axis of the ledge to allow us to fire down into the deadspace that it provided, and in fact, it had the effect of creating an 8-foot barrier on the attacker's side. However, the thick brush to the north of the ledge provided excellent concealment to within meters of the ledge and some 5 meters from the perimeter. At the base of the ledge, a retaining wall allowed for some cover

and concealment from the enemy, but we lacked the resources to completely cover the deadspace it created.[8]

"Generally, observation was good, except for a blind spot on the west wall of the hospital, and the small intervisibility line created by the retaining wall along the ledge. Unfortunately, time did not permit the clearance of the brush north of the ledge, which limited target acquisition in that area.[9]

"Although the battlefield was fairly contained due to the small size of the defense, there were a number of key pieces of terrain in the small area. Shiyane Hill, a rocky hill to the south overlooked the outpost and provided a superb location for an enemy support by fire position. Had the enemy been able to provide accurate and sustained fire from the hill, it would have rendered our position untenable within minutes. The two buildings at the outpost and well-built kraal were key terrain due to the cover that they provided for the defender. Initially, I thought that the loss of any one of these, especially the storehouse, would have resulted in the defeat of the defense. The brush to the north of the ledge provided a location to advance a large number of personnel without immediate observation, a tactic that was successfully employed against us repeatedly during battle.[10]

"Even though the enemy seemed to come from all sides, it became evident that two main avenues of approach existed into the outpost. The first, from the west, took advantage of the blind spot created by the design of the hospital and would eventually prove the open yard in west sector to be untenable. The second was in the north and used the brush to the north of the ledge. It provided a superb assault position for the enemy and allowed them a location to regroup after each attack."[11]

O/C: "Let's continue with the Zulu commander at Rorke's Drift. Prince Dabulamanzi, please explain your intent and concept of operations for the attack on the outpost."

Zulu commander at Rorke's Drift, Prince Dabulamanzi: "During the attack on the encampment at Isandlwana on the morning of 22 January, I was with approximately 4,000 warriors of the uThuwana, iNdlondlo, and uDloko Regiments, as well as elements of the iNdluyengwe Regiment. As the main body pursued British scouts and overran the center column's encampment at Isandlwana, we served as the reserve force and, therefore, did not take part in the assault. With this in mind, I intended to press the attack on the British by attacking the outpost near Rorke's Drift as the remainder of the main body

continued to search for the larger portion of the center column that had not been present at the encampment that morning. My estimate of the situation was that the garrison could have no more than a few hundred soldiers and we had just defeated more than 1,300 at Isandlwana. It seemed a simple enough operation."[12]

O/C: "How did attacking the garrison at Rorke's Drift meet your higher commander's intent for the campaign?"

Prince Dabulamanzi: "Well, it did not meet with the king's intent to conduct defensive operations on Zulu soil. However, my warriors did not get to take part in the battle at Isandlwana, and they could not return home without 'washing their spears.' I had hoped that a successful attack would counteract any repercussions from King Cetshwayo for attacking into Natal. However, a successful attack was not to be the case."[13]

O/C: "Thank you. Please continue with your scheme of maneuver."

Prince Dabulamanzi: "My scheme of maneuver for the attack on Rorke's Drift was based on our standard tactics that have been employed for decades and served us successfully earlier in the day at Isandlwana. As we advanced on the garrison, the regiments were deployed into the standard 'bull's head' formation with an advanced guard in front, the main body directly to the rear, and two 'horns' or crescent-shaped formations to each flank of the advanced guard. The advanced guard would fix the enemy, while the flanking formations would envelop the enemy to block its withdrawal. The main body was then employed at the weakest point to destroy the enemy. The bull formation and subsequent enveloping maneuver is a direct reflection of our warfighting philosophy, which favors tactical maneuver to apply overwhelming force at the enemy's weakest point. Although we travel on foot, our warriors are some of the best conditioned in the world and have no trouble running for miles and launching directly into multiple-hour close combat battles using our stabbing spears and shields."[14]

O/C: "As we commence analysis of the battle, please keep in mind that we are particularly interested in key events and how the warfighting functions of command and control, maneuver, fires, intelligence, logistics, and force protection were tied into the actions of the battle. Lieutenant Chard, please talk us

through the first Zulu attack on the garrison."

Lieutenant Chard: "Although we heard shots all morning coming from Isandlwana, it was not until a Natal Native Horse Troop raced by the garrison that we received our first intelligence update. Having taken part in the defeat at Isandlwana, they had no intention of staying at the drift and quickly rode away. Much of the Natal Native Contingent followed their lead and abandoned post. It reduced our effective combat power from approximately 350 men to around 150, the bulk of which was made up of Lieutenant Bromhead's Company B, 2d Battalion, 24th Regiment. The Natal Native Horse Troop commander did inform us of the results of the battle and it was my understanding that the entire center column had been destroyed. It was not until after the battle that I learned only the encampment at Isandlwana, and not the main body of the center column, had been destroyed.[15]

"After the situation update from the Natal Native Horse Troop commander, I began considering our options. After consulting with subordinates and Lieutenant Bromhead, we came up with two basic courses of action. The first was for the garrison to pack up as much as possible including the infirm, of which we had about 30 men, and move to Helpmekaar approximately 30 miles away, to join the reserve force that had been left there. The second was to stay and establish a perimeter defense at the garrison and use our massed rifle fire to repel enemy attacks. Neither option seemed very appealing at the time. However, after considering the enemy's tactics, his ability to move great distances, and his desire to use envelopment to overwhelm his enemy, I knew that conducting any type of road march over 30 miles of open ground would play to the enemy's advantage. Therefore, I chose the second course of action to stay and defend the garrison.[16]

"I placed an observation post (OP) at the top of Shiyane Hill to give me advance warning, and at around 1600 hours, it informed us that a Zulu army of about 4,000 warriors was moving east toward the garrison. The OP could see that they were starting to transition into their 'bull's head' formation, at which point we immediately manned the entire 100-yard perimeter. At 1630 hours, we saw the initial elements of the Zulu army at about 600 yards west of the west

sector of the garrison. They immediately raced toward us, covering the ground more quickly than expected. Even though the Martini-Henry 0.450 caliber rifles we used could fire out to 1,000 yards, I held fire until 500 yards to more accurately mass our fires."[17]

O/C: "Prince Dabulamanzi, what was your understanding of the situation at this point?"

Prince Dabulamanzi: "I quickly positioned myself on top of Shiyane Hill to observe the battle and more easily control the attack. At this stage, I knew that the advanced guard had immediately launched into an attack on arrival at the garrison. They sought to immediately overwhelm the force when they saw it was even smaller than expected. However, by 1640 hours, the continuous volley of rifle fire from the storehouse and the hospital had created such a heavy crossfire that the assault was halted some 50 meters from the perimeter.[18]

"I would like to point out that although our force was numerically superior, the relatively small size of the enemy's garrison prevented us from using our size as an advantage. As we tried to attack the small, weak points of the enemy's defense, we quickly became backed up at the point of penetration. This meant that every time we massed our forces they were much deeper than they were wide and this limited the number of warriors that we could bring to bear against gaps in the garrison defense at any one time. Combine this bottleneck with the massed fires tearing through our ranks, and it made for a formidable barrier to overcome.

"However, while acknowledging the physical effects that the rifle fire had on our formations, at this point the psychological effects of sustained volleys of rifle fire were negligible. In fact, the 18-inch bayonet that the British used was much more intimidating. It outreached our stabbing spear by more than 2 feet, and each warrior readily understood its effects."[19]

O/C: "Seeing that the garrison was able to effectively repel your initial assault and that your maneuver-style tactics had little effect on the defense, what was your intent with the arrival of the main body?"

Prince Dabulamanzi: "After the advanced guard's attack was repelled, the remaining warriors moved around the

west of the hospital and to an assault position in the thick brush north of the western sector. By 1645 hours, they had commenced a series of assaults on the north perimeter by the hospital. At 1655 hours, seeing heavy fire to the southwest and the advanced guard engaged in an assault from the bush at the north, the main body moved to support the advanced guard's assault.[20]

"It was then that I placed approximately 100 marksmen armed with Brown Bess flintlock rifles, relics of the Napoleonic wars, on Shiyane Hill. However, fires from the riflemen, due to the antiquated rifles and the lack of marksmanship training, failed to produce the desired effects on the garrison. Conversely, the British soldiers on the southern perimeter, being free from the attacks along the northern barricade, were able to fire accurately at the riflemen on the hill. The heavy billows of smoke from the black powder gave excellent aiming points for the British soldiers."[21]

O/C: "Fighting continued along the northern perimeter as the main body joined the fight with the assaulting Zulus spreading out to the east along the entire length of the northern perimeter. By 1800 hours, numerous uncoordinated assaults had occurred along the northern perimeter and to the west at the hospital. Prince Dabulamanzi, what was the intent of these assaults?"

Prince Dabulamanzi: "There was no 'intent' in the military sense of the word, other than to overwhelm the enemy through repeated assaults. These assaults were in effect uncoordinated above the small-unit level. The officers at the subordinate levels were controlling the assaults at this point. Without the ability to maneuver freely, they had started to rely on mass, trying to overwhelm the perimeter. However, they were doing so without coordination between the different units. Remember, we had four different regiments attacking a 50-meter perimeter at the north wall, and I was not in a position to control the attack at the small-unit level. It was a breakdown of the command and control structure caused by our failure to adapt to the enemy's small, well-defended garrison. We did realize, however, that the hospital proved to be the weak point in the defense and the warriors on the west side made a concerted effort to seize the hospital."[22]

O/C: "Lieutenant Chard, it was at about this time, around 1800 hours, that you withdrew your men from the western sector and consolidated and reorganized your defense solely in the eastern sector with the small yard, the storehouse, and the well-built kraal. What was your intent by consolidating and reorganizing the defense and what effects did it have on the battle?

Lieutenant Chard: "We were defending a 100-yard perimeter and started taking a number of casualties. I was concerned that we would not have sufficient numbers to man the entire perimeter, and therefore decided to consolidate my defense within the eastern sector."[23]

O/C: "This left the hospital undefended. As you mentioned in your estimate of the situation, the hospital was determined to be key terrain, and without it, you expected the garrison defense to fail. How did you expect to overcome the loss of the hospital with your new defensive position?"

Lieutenant Chard: "Although the hospital was key terrain, as the battle progressed it became evident that if the large open yard were left to the enemy, it would give them no greater tactical advantage than they already had.

"With the same number of soldiers covering a perimeter of approximately 30 yards instead of 100, I was able to make my defense much more compact. It also became an issue of force protection as the eastern sector was almost completely obscured from the Zulu marksmen to the south on Shiyane Hill. Although the Zulu marksmen may not have been able to achieve their commander's desired effects, their sustained rifle fire still had some effects on the garrison, especially into the large open yard. In fact, with our withdrawal, we were now able to cover the large open yard by fire, turning it into a 'no-man's land.' Really, the only problem with the contraction of the defense is that it isolated the men in the hospital. However, once the thatched hospital roof was set on fire at about 1930 hours, most men in the hospital made the dangerous withdrawal across the open yard to the eastern sector."[24]

O/C: "Prince Dabulamanzi, with the consolidation and reorganization of the British defense, how did you change your overall attack on the defense?"

Prince Dabulamanzi: "It quickly became apparent that by consolidating their perimeter in the east, our seizing the hospital would not cause the desired penetration of their defense. In fact, due to the enemy's covering fire of the large open yard, seizing the hospital put us further from the enemy than at any other point around the garrison. In addition to the shear distance of open space created by the British withdrawal, the fire on the hospital roof served to illuminate the area as darkness fell.[25]

"Seizing the hospital did gain us one advantage; it enabled us to use the ledge and mealie bag perimeter on the northwest side of the garrison as a covered and concealed assault position. This position became critical as the weakest point of the new defense became the northeastern corner of the eastern sector perimeter where the biscuit box wall tied into the mealie bag barricade. We tried to penetrate at this point, and succeeded in causing several enemy casualties, but again, due to the small size of the gap in the enemy defense, we could never mass enough warriors to break through before being repelled by close combat supported by volumes of enemy fire.[26]

"When darkness fell at 1930 hours, we shifted our attack to the eastern flank of the garrison to assault the perimeter from an area that was not illuminated by the hospital's burning roof. However, attacking in the dark again exposed a fault in our command and control system as hand and arm signals were used extensively to coordinate the large formations. We were now required to shout orders over the sound of rifle fire and war cries, causing more confusion than anything else."[27]

O/C: "The Zulu assaults on the eastern perimeter did, however, succeed in pushing the British defense out of the well-built kraal, leaving only the storehouse and the small open yard as a perimeter. Lieutenant Chard and Prince Dabulamanzi, please take us from this point to the end of the battle, and explain why the defense did not fold with the fall of the well-built kraal."

Lieutenant Chard: "The assault on the well-built kraal from the east did cause concern because it allowed the enemy to maneuver within feet of our perimeter that was covered by the rock walls of the kraal. However, we established a redoubt in the center of the

small yard that allowed a small group of soldiers to fire over the soldiers manning the perimeter and down into the deadspace created by the kraal. This did not allow the enemy to effectively use the kraal to advance toward our perimeter. More disconcerting to our situation was the low amount of ammunition we had left. We started with 20,000 rounds and by the last assault were down to 900. Any further assaults would have surely resulted in a complete hand-to-hand fight without supporting fires."[28]

Prince Dabulamanzi: "Even though fighting continued until well past midnight, this attack's failure to produce a decisive result proved to be the culminating point of the operation. It was around 2100 hours, and our warriors had been fighting for over 4 hours nonstop and had sustained hundreds of casualties. We continued to conduct limited assaults on the perimeter for another hour, but were repelled by heavy fires each time. Hearing the British cheers at the defeat of the final charge at 2200 hours, we withdrew into the darkness to regroup. We kept up heavy fires at the enemy perimeter until after midnight and then a few times after midnight, but this was merely an attack by fire and did not support any further assaults on the garrison. By 0400 hours, the last shots were fired against the garrison and our regiments had withdrawn behind Shiyane Hill. A small contingent returned around 0700 hours to observe the garrison but soon left, moving to the southeast to meet up with the main body."[29]

O/C: "Thank you, let's please finish up with a few conclusions from the battle. What actions during the battle would you like to see sustained in future operations, and which require improvement? Prince Dabulamanzi."

Prince Dabulamanzi: The fierce manner in which our warriors executed their assaults is definitely the key action that should be sustained in future operations. It was the only element that kept us in the fight after it came to light that our maneuver tactics and massed assaults were not overcoming the enemy defenses.

"However, we will never overcome the massed rifle fires from a fixed defensive position if we do not revise our tactics for attacking an enemy strong-point. Our maneuver tactics are superb in the open ground, but are less effective against a well-armed enemy using a perimeter defense. We need to have better trained riflemen and rifles to act as a support by fire as we advance to destroy the enemy in close combat. Until we achieve this level of coordination of effective fire and movement, the enemy will use their superior firepower to attrit us before we can close with and destroy them.

"Our command and control system also needs improvement, as we will increasingly be required to conduct night operations. Current hand and arm signals do not always allow us to adequately coordinate the maneuver of subordinate elements while allowing the commander to take up an observation point on the high ground. The use of runners and messengers, as well as the practice of organizing into standard formations for units smaller than a regiment, will allow us to exercise greater control over our warriors in the attack."

Lieutenant Chard: "Until the Zulus can employ sustained and accurate fires to support their movement, we will overcome their maneuver tactics by forming a perimeter defense and using massed fires to repel their assaults before they close with our positions. As evidenced by the number of rounds we used to repel the attack — almost 20,000 — logistics sustainment will be critical to executing this tactic."

O/C: "Thank you gentlemen. That concludes our AAR for the battle of Rorke's Drift."

Notes

[1]Donald R. Morris, *The Washing of the Spears*, Simon and Schuster, Inc., New York, 1965, p. 294.

[2]Ibid., pp. 294-295.

[3]Ian Knight, *The Zulus*, Osprey Publishing Ltd., London, 1989, p. 31.

[4]John Laband, *The Rise & Fall of the Zulu Nation*, Arms and Armour Press, New York, 1997, p. 213.

[5]Ian Knight, *Rorke's Drift 1879: Pinned Like Rats in a Hole*, Osprey Publishing Limited, Oxford, U.K., 1996, p. 23.

[6]Michael Barthrop, *The Zulu War, A Pictorial History*, Blandford Press, U.K., 1980, p. 77.

[7]Ibid., pp. 74-75.

[8]Knight, *Rorke's Drift 1879*, pp. 26-30.

[9]Ibid.

[10]Ibid., pp. 28-36; and Victor Davis Hanson, *Carnage and Culture: Landmark Battles in the Rise of Western Power*, Doubleday, New York, 2001, p. 289.

[11]Knight, *Rorke's Drift 1879*, p. 40.

[12]Laband, pp. 231-233.

[13]Hanson, pp. 291-292; Laband, p. 233.

[14]Hanson, pp. 317-321.

[15]Morris, p. 397.

[16]Ibid., pp. 392-395.

[17]Knight, *Rorke's Drift 1879*, pp. 36-40.

[18]Ibid., p. 41.

[19]Ibid., p. 40.

[20]Ibid., pp. 42-44.

[21]Ibid., pp. 44-45.

[22]Hanson, pp. 318-321.

[23]Knight, *Rorke's Drift 1979*, pp. 46-48.

[24]Ibid., pp. 48-50.

[25]Morris, pp. 412-413; Laband, p. 236.

[26]Knight, *Rorke's Drift 1879*, p. 48.

[27]Ibid., p. 65.

[28]Laband, p. 236; Knight, *Rorke's Drift 1879*, p. 69.

[29]Laband, p. 236; Knight, *Rorke's Drift 1879*, pp. 67-69; Morris, pp. 414-415.

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Achieving Mass at the Decisive Point
The Role of the Planning Staff

by Captain Chris Rogers

One of the primary challenges that units face at the tactical level is the ability to achieve mass at the decisive time and place. While there are many reasons why units struggle to mass, this article focuses on the role of the planning staff and the effect they have on their units' ability to achieve mass.

"Mass" is defined by FM 3-0, *Operations*, as the ability to "concentrate the effects of combat power at the decisive place and time."[1] The concept of massing combat power is fundamental to doctrine. In addition to being listed among the principles of war, it is the only characteristic common to both offensive and defensive operations.

To be successful on the battlefield, units must increase the disparity between friendly and enemy forces by reducing enemy combat power. This is accomplished by synchronizing elements of friendly combat power to create overwhelming effects at the decisive time and place.[2] Through synchronization, commanders arrange battlefield operating systems to mass effects so that they can overwhelm an enemy or dominate a situation. In essence, mass is a critical ingredient to success on the battlefield, and synchronization is the means to that end.

As a battle staff trainer, I have observed 15 different staffs conduct more than 75 iterations of the military decisionmaking process (MDMP). The most prevalent observed trend is their collective struggle to achieve synchronization across multiple battlefield operating systems (BOS). This lack of synchronization during planning has a direct impact on their unit's inability to mass effects during execution; "Without synchronization, there is no massing of effects."[3]

Some might argue that this shortcoming results from a faulty planning process, that the MDMP is too cumbersome and time-consuming to be effective — particularly when constrained by uncertainty and time. While developing and comparing multiple courses of action (COA) in a time-constrained environment is arguably counterproductive, our

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current process does not limit our ability to develop effective plans timely. Our doctrine identifies that tactical planning horizons are short and that comprehensive planning may not be feasible for continuous operations. Subsequently, it gives the commander and staff the flexibility to manipulate the process through timesaving techniques.

The most timesaving technique is for the commander to limit the number of COA developed; the specific technique we most often see at the National Training Center is the commander elects to have his staff develop, refine, and wargame a single COA. Unfortunately, this technique typically leads to a plan that is no more synchronized than those developed from choosing one of many multiple COAs. This happens because the staff accepts the commander's directed COA as if it was complete and moves directly into the wargaming process. Without developing the COA before entering the wargame, the staff

lacks the tools necessary to reach the level of detail required to synchronize the plan. Despite the ability to manipulate the process and use timesaving techniques, staffs still struggle to produce synchronized plans because they do not understand what they are trying to achieve at the conclusion of each MDMP step, or at the end of the entire process.

For staffs to understand how to synchronize, they must first understand synchronization. According to FM 3-0, synchronization is "arranging activities in time, space, and purpose to mass maximum relative combat power at the decisive place and time."[4] Since we have already identified that synchronization is the means to achieving mass, we can deduce that the fundamental elements of synchronization are arranging activities in purpose, space, and time. The conceptual link then for the staff is to determine when during the planning process it is most efficient and

effective to arrange activities in purpose, space, and time.

During COA development, the commander seeks to integrate the elements of his combat power with other potential combat multipliers, combat support (CS) and combat service support (CSS), against the enemy. This integration culminates in developing a scheme of maneuver. According to FM 101-5, *Staff Organization and Operations* (soon to be replaced by FM 5-0), the scheme of maneuver includes much more than just how to incorporate maneuver forces, it also includes reconnaissance and security operations, concept of fires, integration of obstacle effects, and priorities for each CS and CSS element.[5] This fully developed scheme of maneuver coordinates the operation to show the relationship of friendly forces to one another, the enemy, and terrain. Through this integration, we achieve two of the three elements of synchronization — we arrange the activities of our assets in terms of space and purpose.

Timing the operation is not incorporated into the scheme of maneuver because we do not yet have the tools to achieve this level of detail. This becomes apparent when we consider the tools used to portray the enemy during COA development. Typically the S2 prepares one or more situational templates (SITTEMP) as part of the initial intelligence preparation of the battlefield (IPB) conducted during mission analysis. It is these SITTEMP that drive our COA development process. A SITTEMP is a graphical depiction of expected threat dispositions in a likely enemy COA, at the most critical point in the operation, as determined by the S2 and S3.[6] A SITTEMP is essentially a snapshot of what we expect the enemy to look like at a given point in the operation. Since we are using a static template to depict the enemy during COA development, we gain little from attempting to apply timing to our actions in the form of triggers. Thus, it makes sense and provides a more manageable process to first focus solely on integration — the space and purpose elements of synchronization.

The final step of COA development is preparing a COA statement and sketch, which together describe who, what, when, where, how, and why for each subordinate element. By portraying friendly maneuver units, pertinent targets, target groups, mobility/countermobility assets, locations for CSS assets, and other

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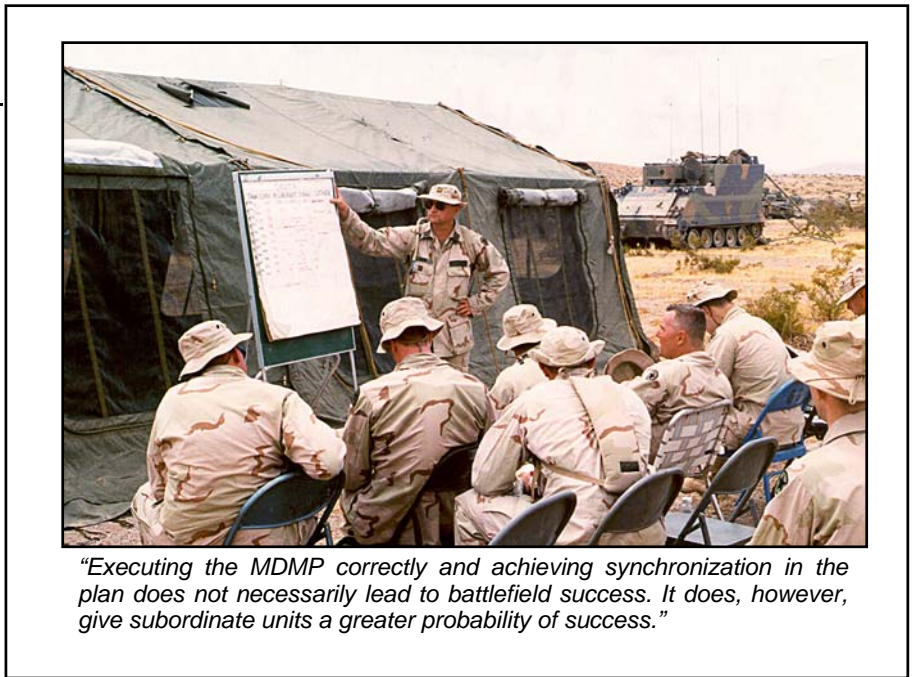
applicable combat multipliers in the form of a sketch, we can fully visualize the entire scheme of maneuver. If used efficiently, these tools assist the staff in confirming that they have fully integrated all available resources — the elements of combat power, including maneuver, firepower, protection, leadership, and information with CS and CSS assets. This allows the staff to verbally describe the scheme of maneuver (purpose), and visualize the spatial relationship of friendly forces to one another, the enemy and terrain (space). What we lack at this point, however, is timing the operation. This final element of synchronization allows us to apply the appropriate sequence and triggers to our actions to create an overwhelming dilemma that limits the enemy's ability to react.

The wargame is the next step in the MDMP and the final step of a single COA scenario prior to the commander's approval and producing the operations order. Because this is the final analytical task in the planning process, it is critical that timing, the final element of synchronization, be accounted for during this step. While the purpose of the wargame is not simply to apply timing to the friendly COA, it should be one of the principal results we look to achieve from the process, given the importance of synchronization on our ability to mass.

FM 34-130 tells us that during the wargaming session the staff "fights" the set of threat courses of action.[7] We use the tools of the IPB, give them a doctrinally sound, purpose-based commander (S2) and allow him to fight the enemy

COA against ours. The doctrinal method we use to do this is an iterative action-reaction-counteraction process, focused on a series of critical events. Since this process attempts to visualize the flow of the battle and combines friendly and enemy force interaction, it is the logical step in which to incorporate timing with our actions.

As the staff wargames each critical event, they evaluate each friendly-enemy interaction to determine that they have allocated adequate resources and identified appropriate actions for that scenario. If they determine an action to be time-sensitive (either in sequence or desired effect), they must then establish the appropriate trigger and capture in it whatever tool they have chosen to record the results of the wargame. For example, an armor task force is planning to breach during a deliberate attack. They are establishing a company-sized support by fire (SBF) to provide direct fire suppression of the objective in conjunction with indirect fire suppression and obscuration. To maximize force protection and retain combat power, they do not want to occupy the SBF, which is in direct fire range of the enemy, without the complementary effect of indirect fire. To ensure they maintain momentum, however, they do not want to unnecessarily stop the company short of the SBF to wait on the indirect fire. To achieve this effect, they establish a trigger for the indirect fires that takes into account the company's rate of movement and any time associated with the call-for-fire, such as radio transmis-

The Officer Education System:
Future Challenges for Armor Officers

by Captain Thomas J. Nagle

The Armor Captains Career Course (ACCC) is preparing to meet the future challenges of educating our officers with the new Officer Education System (OES) transformation. Concepts that will be implemented in the new emerging courses are now being applied in the ACCC course during a test phase prior to the pilot course in November 2002. The ACCC currently is not meeting the needs of its graduates because of issues that will be magnified in the coming transformation. These issues must be carefully thought out and corrected prior to implementing the new courses to prevent a generation of officers from failing to meet the needs of the new battlefield environment.

In May of 2001, the results of a study chartered by U.S. Army Chief of Staff, General Eric Shinseki, were released. The Army Training and Leader Development Panel (ATLDP) identified char-acteristics and skills required by leaders of the transforming force.[1] Technology was recognized as a factor in the changing operational environment, but the centerpiece of the formations in the Army remained soldiers and leaders. As for the leaders, they will be forced to operate in a more complex battlefield where "tactical actions by lieutenants, sergeants, corporals, and their command-ers can have strategic consequences."[2] In an environment that is generally rec-ognized as more complex than previous battlefields, it logically follows that suc-cessful leaders must be better educated in tactical problemsolving, more effec-tive in using the rapidly changing tech-nological aspect of warfighting, and bet-ter versed in managing the multiple fac-ets of support operations and stability operations. In addition, the staff offi-cers that support the commanders must likewise have a thorough understanding of these issues when the first warning order (WARNO) for deployment is writ-ten.

The study identified several areas in which the current OES is failing to meet the needs of the changing environment. The OES is underresourced and not co-ordinated with the Army's needs, pri-marily because it has been largely un-changed since the end of the Cold War.[3] The study suggests several remedies to address these shortfalls, including plac-ing the most professionally qualified in-structors in all leader-level schools. In addition, schools must identify and teach to established tasks and purposes. These tasks should be focused based on the type of school the officer is attend-ing and must ensure officers are edu-cated to a common standard. Finally, the schools must be vertically integrated, ensuring that the sequence of schools the officer attends is coordinated with the officer's assignments and builds on the previous school's instruction, and are horizontally integrated, ensuring of-ficers are educated to a common stan-dard between branches.[4]

The Current Armor Education System

The ACCC is attempting to remedy some of the problems identified in the study as far as establishing common tasks and enhancing the graduate's ex-perience level in positions he will oc-cupy in the near future. Conceptually, the course identifies proficiency levels in various tasks that the graduate should achieve. Tasks are categorized as: mas-ter tasks, which the graduate must per-form without the aid of references; know tasks, which the graduate must perform with minimal aid from a refer-ence such as a field manual; and under-stand tasks, which the graduate must be able to locate pertinent information on.

To address experience enhancement, a gauntlet concept is applied, and stu-dents from several schools participate in a training exercise in positions they will occupy in the force. For example, ACCC students act as company com-manders while AOB students act as pla-toon leaders. These gauntlets can be conducted in live maneuver training ex-


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Planned CABCC Structure

ADL		Resident, Armor School	Resident, CTC
2 Weeks	2 Weeks	4 Weeks	2 Weeks
TRADOC Common Core Focus: Leader Development	Pre-Resident Commander's Course Focus: Company Command	Company Commander's Course Focus: Battle Command	CTC Train-the-Trainer Focus: Training Doctrine

Days 1-3 *TACOPS* Gauntlets, Sand Table Exercises Classroom Training	Days 4-8 SIMNET and CCTT Gauntlets	Days 9-24 Live Gauntlets

ercises, simulation-based exercises, or in constructive exercises based on the *TacOps* computer game.

Currently, the program of instruction (POI) for ACCC is heavily focused on the processes used in the force, such as the military decisionmaking process (MDMP), intelligence preparation of the battlefield, and operation order (OPORD) production, rather than the product actually produced by the student, such as the plan described by the OPORD or a tactical decision during an engagement. The small group instructor (SGI) provides feedback to students on their products. Some product feedback will also come from their degree of success in executing one of the gauntlet exercises.

Approximately 14 hours of classroom time is devoted to learning the fundamentals of the processes associated with the MDMP, according to the training calendar for the current ACCC class.[5] Approximately 100 hours is devoted to the practice of applying those fundamentals (process execution) in practical exercises while developing OPORDs, such as conducting wargames, developing courses of action, and conducting staff briefings. About 100 hours is devoted to gauntlet-type exercises (product evaluation). At first glance, this may sound like an even distribution between product- and process-type instruction. However, these 100 hours of gauntlet exercises break down to a total of approximately 30 iterations with different chains of command for approximately 12 students. The only leadership positions available during the majority of these exercises — close combat tactical trainer (CCTT) or simulation network (SIMNET) based — are those for the platoon leaders, commander, and observer controllers (OCs). Combat arms captains should already be proficient at being platoon leaders, and will not become OCs at a combat training center (CTC) for another 4 years. The only relevant, firsthand experience, therefore, is the commander's position. An ACCC student can expect to act as a commander a maximum of three times out of the 30 iterations, or approximately 9 to 12 hours out of the 100 hours devoted to gauntlet-type exercises.
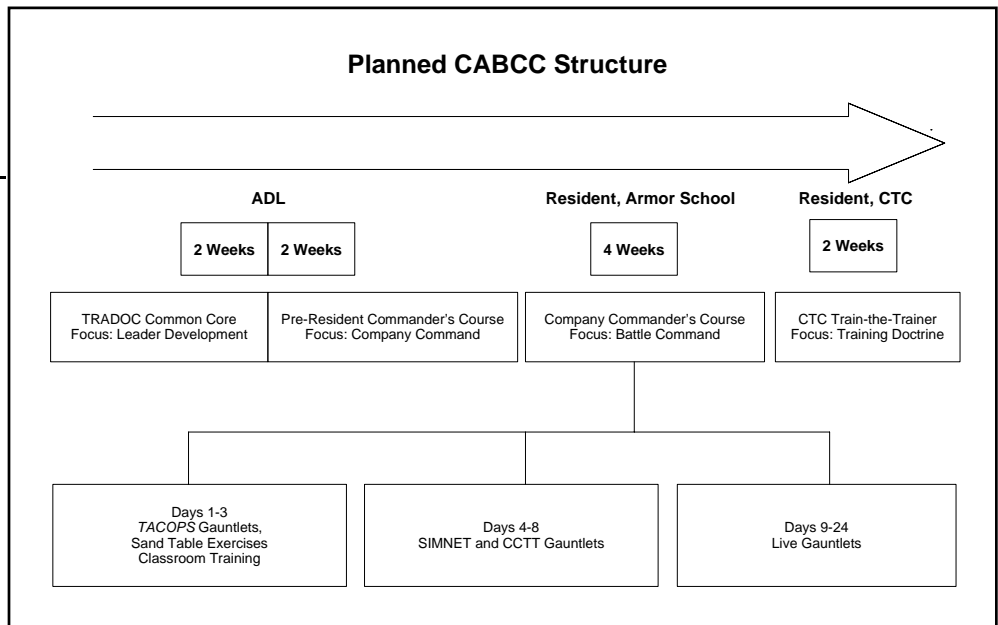
Conceptually, the ACCC should focus on five master tasks that will do the most to develop students and prepare them to act as commanders or battle captains. These tasks include conducting troop-leading procedures (TLP), rapid decisionmaking that results in a standard overlay order, being lethal at the point of contact, inspecting a company, and land navigation. These should be the main focus of the class, or the tasks that have the most time devoted to them. However, there is currently no time devoted to inspecting a company or land navigation (which should probably be a master task for the AOB class, rather than ACCC). There is little time devoted to being lethal at the point of contact, save for the time an officer spends in a command position during one of the gauntlets; practicing TLP, since there is limited time to act as a commander; or producing an overlay order. The majority of the time is still devoted to learning the MDMP and putting it in to practice. In addition, there is little guidance about what inspecting a company specifically entails, such as in-ranks inspections, command inspections, and precombat inspections. There is also little instruction on how to be lethal at the point of contact, such as direct-fire planning, developing verbal fragmentary orders (FRAGOs), and integrating combat multipliers. In short, no tasks/conditions/standards currently exist for these master tasks.

The current plan for implementing the OES transformation is to move to a model that relies heavily on distance learning and phased education that corresponds with the officers' career progression.[6] This means separating the

ACCC into two distinct courses. The first is the Combined Arms Staff Course (CASC), which for Armor officers will be almost exclusively through distance learning. The course will consist of 2 weeks devoted to a common core program, which all officers must complete, and 1 week devoted to the staff position they will assume.[7] The next is the Combined Arms Battle Command Course (CABCC), which will have a 4-week distance learning phase, a 4-week resident phase at the student's branch school, and a 3-week resident phase observing training at the National Training Center (NTC).[8] Ideally, the student will learn relevant basics during the distance learning portion, apply the concepts during the resident phase at the branch school during gauntlet exercises, and observe and correct training for other units at the NTC.

The Current Issues

The education system for armor officers is attempting to emphasize evaluating student products (tactical decisions in engagements). The tools to do this are simulation-based gauntlets in CCTT and SIMNET, and *TacOps.* Again, the time in a command position during these gauntlets is severely limited. This is partly attributed to the difficulty in coordinating these events with other classes to get AOB and AIT students to act as platoon leaders, gunners, and drivers. As a result, ACCC captains spend most of their time during these events in the driver's hole, gunning, or loading. There is also a shortage of these simulators and hours during which they are available for use — 0800 to 1600 hours, with an hour break for lunch).

"Conceptually, the ACCC should focus on five master tasks that will do the most to develop students and prepare them to act as commanders or battle captains. These tasks include conducting troop-leading procedures (TLP), rapid decisionmaking that results in a standard overlay order, being lethal at the point of contact, inspecting a company, and land navigation."

The master task of being lethal at the point of contact receives little emphasis for the individual student. During live, force-on-force gauntlets, this problem is somewhat alleviated, but due to the rapid move from mission to mission, training opportunities are missed for the participants. For example, during the AOB 10-day war, the students execute two company missions per day during the last 4 days. The scenarios are canned and the time between missions is rushed. As a result, captains working in the tactical operations center (TOC) do not get an opportunity to experience an MDMP. In addition, the commander has limited opportunities to conduct assembly area operations since there can be as little as 3 hours between missions with different chains of command, and the lieutenants have little interaction with commanders to learn from their experience due to the need to rush to the line of departure. The shortcuts taken undermine the master task of executing TLP to standard, and provide no reinforcement to any tasks executed in the TOC.

In theory, *TacOps* gives a would-be commander multiple opportunities to test his tactical abilities in a computer game simulator with few required resources. I believe *TacOps* is a poor method to assess a commander's tactical ability. Furthermore, it does not support any of the master tasks identified by the course, except perhaps be-

ing lethal at the point of contact. However, direct-fire planning during OP-ORD production is not effectively replicated in *TacOps*. Additionally, for a commander, being lethal at the point of contact should mean giving timely, concise orders for subordinates to follow. Selecting commands from a drop-down menu in a turn-based game gives a player unlimited time and no room for the computer to misinterpret orders. There are also enough game-isms in *TacOps* to allow the player to win without sound tactical decisions, and not enough unpredictability in the computer-based OP-FOR to simulate a thinking enemy. The 2001 Quadrennial Defense Review from the Pentagon, despite its emphasis on developing new technologies, recognizes that "simulations and war games have inherent limits in terms of how far they can go in identifying new forms of operation."[9] Relying heavily on games to teach tactics in a rapidly changing battlefield environment will therefore have serious limitations.

The Transformation

During the distance-learning scenario, two SGIs will monitor computer-based training for a class of 48 students to educate them on the basics of military operations and being a commander. These two SGIs will also instruct the students during the resident phase of the class. During the resident phase, the course will be almost exclusively product-based

instruction, as the students are evaluated in their success as commanders during the gauntlet exercises. The tentative plan for the CABCC has the first 3 days devoted to gauntlets executed via *TacOps,* the next 5 days devoted to gauntlets executed in CCTT and SIM-NET, and the final 16 days devoted to gauntlets in live scenarios with tanks and HMMWVs.

It is doubtful that students will have the opportunity to fill command positions a full 10 percent of the time, as is being experienced now. Instead of a small group of 12 students waiting to command in simulations, 24 students will be waiting — assuming each SGI takes one-half the class and personally observes the captain's performance to grade him. With less time to interact with SGIs in the condensed course, more time will be spent waiting to perform a meaningful duty during gauntlet exercises. With the difficulty of coordinating multiple schools to provide personnel during CCTT and live gauntlets, CABCC students will likely need to cover down on non-leadership positions such as gunners, loaders, and wing-tank commanders. This situation does little to address the problem of providing students with a better education in tactical problemsolving from the commander's position.

With the emphasis on execution in the new CABCC, there is no time to participate in process execution events such as MDMP and staff briefings. (Currently, 100 hours are devoted to this during ACCC.) It is doubtful that distance learning can offer an effective alternative to learning complex processes, such as the MDMP, to classroom based, group efforts during these exercises. The intent may not be to focus on this since the resident phase is referred to as the "Company Commander's Course." However, no alternative has been identified to teaching this, unless it is taught in CASC, which would still be distance-learning based.

Without this time to execute the MDMP in a classroom group setting, there is little time for students to learn from each other's experience. Ask an infantry student at the ACCC how he learned to employ tanks, or an armor student how he learned to employ dismounted infantry or scout assets. Chances are, they learned them in discussions while executing the course of action development step of the MDMP. In addition, students will have experienced the Middle East, Korea, the

CTCs, Bosnia, and possibly Afghanistan. There is no time for students to explore the differences in operating in these environments through classroom discussions under the current plan.

With only two SGIs available to teach 48 students, the commanders in charge of the troops teaching these classes will have fewer people providing input to the course structure and content. Incidentally, a class size of 48, rather than the 70 to 80 students currently attending ACCC classes, will mean less time between teaches for troops to process students each year, leaving less time to update or revise the course. As a result, once the course is "packaged" for the computer, the distance learning-based portion has a real risk of becoming stale and outdated in the midst of the rapid changes identified by the ATLDP. Therefore, the course will become isolated from the force and will fall short of meeting the needs of the Army.

As far as the instruction that is not addressed in the current plan for the CABCC, the burden falls to the units to make up the shortfalls. This means person-to-person instruction in areas such as TTPs for conducting rehearsals, COA development and analysis, wargaming, and conducting staff briefings. I assume this will not take place after a captain serves his time as a commander, since a large percentage of captains move to non-branch assignments following command, which means the instruction must take place before command. From my experience, a FORSCOM unit has little time to devote to teaching a support platoon leader how to conduct a task force rehearsal, the S1 to conduct a wargame, or the battalion maintenance officer to conduct a course of action briefing. The experience in a battalion to teach these things is concentrated in a few individuals that have a great deal to accomplish daily, even when not preparing for a major training event.

An Opportunity

The move to the new course structures is inevitable. However, the content and method of teaching these courses is not set in stone. I believe it is possible to organize the courses to follow a logical progression, teach the important processes, and ensure they remain relevant to the needs of the Army. By meeting these standards, we will provide better-educated officers that are current with recent trends in TTPs and technology.

First and foremost, course instructors must be increased to one SGI for every 6 to 8 students. This will allow the SGI to provide more timely feedback and answer questions the students will have during the distance-learning portion. This will also free up time for SGIs to actively provide feedback and adjust the POI after course structure experience accumulates. During the resident phase, students will also have more interaction with the SGIs, ensuring instruction time is used to the maximum possible extent.

Revise the master tasks and ensure the POI supports them. Possible candidates include TLPs, rapid decisionmaking that results in a FRAGO, preparing a company training plan, and executing the MDMP. The definition of a "master" task may need to be revised (references will be needed), but it is at these tasks that new commanders and battle captains must be proficient. Other tasks, such as know and understand, must be covered in other course work, but should support learning the master tasks. Alternatively, each course has master tasks that support the following courses. This achieves the vertical integration identified by the ATLDP study and focuses students on tasks relevant to their next assignment. In addition, clear conditions and standards must exist for every master task.

The distance-learning portion of the course must focus on teaching the basics of operations, such as deliberate attack, defense, and movement to contact, in addition to MDMP basics to prepare students to execute these tasks once they arrive for the resident phase. Training management can be covered during the distance-learning phase to address the "training plan" master task. Rather than use *TacOps* as a gauntlet exercise at the school during the resident phase, it should be used during the distance-learning phase to convey specific concepts in tactical operations. While I do not believe *TacOps* is effective in a free-play scenario to teach captains actual tactics, it can be useful to illustrate concepts and the effectiveness of certain courses of action. Students will begin to cultivate ideas to use in the resident phase during discussions and gauntlets.

During the resident phase, implement discussions within smaller groups of 6 to 8 students to address tactical problems presented in vignettes. Students should have at least 1 week to discuss ideas, solutions, and develop quick

FRAGOs to implement solutions. This process is used as a means to select the winner of the tactics competition at the end of the ACCC course, so it must have some value as a teaching tool. Each group should easily cover 2 to 3 vignettes per day and should update or change them to meet their specific group needs. Feedback can be provided to students on their FRAGOs, and will assist in determining the effectiveness of their delivery methods. This will support the master task of quick decision-making and allow students to learn from other's experiences. Furthermore, it will address the flexibility issue identified by the ATLDP study.

One full week should be devoted to executing the MDMP deliberately and writing orders. Conventional wisdom suggests that this is not enough, but no more time is available. Additionally, student skills will be honed in executing this process during gauntlet exercises in the final 2 weeks. With fewer students, there will be no need to include "soft positions," such as the air defense officer who has a smaller role in the MDMP, and redundant work will be reduced. Student work can focus on the XO, S3, S2, S3A, S1/S4 (use only one logistics planner), engineer, and field artillery officer. Obviously, this supports the MDMP master task.

Finally, gauntlet exercises should be substantially scaled back. The time a student spends at the schoolhouse under the supervision of an SGI has just become much more important. Rushing from mission to mission, as we do now during live gauntlets, wastes time. The Armor School has ample experience to know that this does nothing to reinforce good habits in lieutenants and captains. Furthermore, this robs captains of an opportunity to go through a deliberate mission analysis. It also ties up a great deal of manpower in meaningless positions, such as the S3 or XO, because of canned scenarios. The gauntlets, whether they are live or simulation-based, should be capstone exercises during the final 2 weeks of instruction. This should also alleviate scheduling problems, since it is difficult to coordinate field time or simulation time for two or more courses to coincide repetitively throughout the year for the entire 4-week resident phase.

For live gauntlets, events such as the AOB 10-day war should have platoon lanes staggered with company missions. During the platoon lanes, CABCC students run through a mission analysis

and produce an order for another group to execute in the company lanes. The commander should issue WARNOs and start the TLP as the platoons finish their lanes, which support the TLP master task. This involves more captains in the gauntlet by making the TOC functional and allows a commander more time to be with a company and conduct operations such as assembly area operations to standard at the end of the day. The SGI will also be able to continue to develop the staff skills of the officers executing the MDMP. The same methodology can be followed for CCTT and SIMNET exercises and allow the CABCC students to execute the MDMP, perhaps in a time-constrained environment as described in U.S. Army Field Manual 101-5, *Staff Organization and Operations*.[10] Several groups can simultaneously execute the MDMP for the next day's missions. Three missions can be run daily with these simulators (with current time constraints), which allow drivers and gunners from two groups to support the third group.

After each module taught in the ACCC, an after action review is written to provide feedback on course improvement. This keeps the course relevant and useful to the students. As pointed out at the beginning of this article, change is still needed and will happen. Our duty is to ensure that we can build flexibility and relevancy into the new course. Cutting the instructor staff while increasing the number of classes taught per year, focusing on product or execution-based evaluation exclusively, and wasting the time students have to interact with instructors in a face-to-face environment will do little to accomplish this. As the pilot course is implemented, hard evaluation of its effectiveness must take place. Can students pass the write-for-life after receiving only distance learning instruction? Can students understand which material from a higher headquarters' OPORD is essential to theirs? Can students execute the MDMP without guidance from an instructor present in the classroom? If not, a wide variety of issues must be addressed before full implementation.

Notes

[1]Lieutenant General William M. Steele and Lieutenant Colonel Robert P. Walters Jr., "Training and Developing Army Leaders," *Military Review*, July-August 2001, p. 2.

[2]Ibid.

[3]Ibid.

[4]Ibid.

[5]ACCC Weekly Training Calendar 02-003, 16 August, 2002.

[6]CPT Jason Slider, Point Paper on OES Transformation and the Combined Arms Battle Command Course, 12 February 2002, p. 1.

[7]LTC Steven Carmichael, CPT OES Significant Activities Update, July 2002, p. 2.

[8]Ibid.

[9]Department of Defense, Quadrennial Defense Review Report, 30 September 2001, p. 36.

[10]U.S. Army Field Manual 101-5, *Staff Organization and Operations*, U.S. Government Printing Office, Washington, D.C., 31 May 1997.

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sion, clearance of fires, time of flight, and appropriate adjustments). The trigger for the call-for-fire is then expressed in relation to the location of the company, such as Company A crosses Phase Line SAM, or some other clearly defined event.

By the end of the wargame, the staff has portrayed the best possible identical vision of the battle to help visualize its flow, anticipate events, and determine how to maximize employing available assets. The results of the wargame provide the staff with a great deal of information ranging from casualty estimates to refined commander's critical information requirements. The staff must not, however, lose sight of their role in helping their unit achieve mass through synchronization. After identifying pertinent coordination requirements and incorporating sequence and triggers into the unit's actions, they must clearly capture their efforts and incorporate them into the operations order.

Executing the MDMP correctly and achieving synchronization in the plan does not necessarily lead to battlefield success. It does, however, give subordinate units a greater probability of success. Conversely, a plan that lacks synchronization drastically reduces, but does not eliminate, the likelihood of success. Commanders mass the effects of combat power to overwhelm and ultimately defeat an enemy. While mass is achieved at the tactical level during the execution of battles and engagements, it is the attainable result of a planning process that incorporates the three elements of synchronization. Staff training focused on the doctrinal process of developing synchronized plans can greatly improve a tactical unit's ability to achieve mass — ultimately leading to decisive victory on the battlefield.

Notes

[1]U.S. Army Field Manual (FM) 3-0, *Operations*, U.S. Government Printing Office, Washington, D.C., 14 June 2001, p. 4-13.

[2]Ibid., p. 4-3.

[3]Ibid., p. 4-17.

[4]Ibid.

[5]FM 101-5, *Staff Organization and Operations*, U.S. Government Printing Office, Washington, D.C., 31 May 1997, p. 5-13.

[6]FM 34-130, *Intelligence Preparation of the Battlefield*, U.S. Government Printing Office, Washington, D.C., 8 July 1994, p. 2-45.

[7]Ibid., p. 1-6.

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Countering the Tactical UAV Threat

by Captain Darrin B. Mirkarimi and Christopher Pericak

"The trend of UAV proliferation is clear and countering this threat must be addressed when planning any operation where enemy forces have the potential to successfully employ UAVs."

It is Phase II of Operation Urgent Guardian and U.S. Army Ground Forces are operating under an umbrella of air superiority to destroy enemy forces in their assigned areas of operation. An armored task force is conducting a movement to contact at night. At first undetected, an enemy unmanned aerial vehicle (UAV), using its infrared sensors and real-time datalink, relays the unit's location to a terminal at the ground control station (GCS). The GCS immediately sends the coordinates to the fire direction center. The UAV is flying at an altitude of 2500 meters and targeting the task force at a range of 10 km in their direction of travel. Sentinel radar detects the UAV, but due to legacy air defense's existing range limitations, the crew must forward the information to the brigade for action. As Apache attack helicopters are dispatched to intercept and destroy the UAV, dual-purpose improved conventional munitions from an enemy artillery battery barrage the task force. DIVARTY multiple launch rocket system (MLRS) directs successful counterfire against the enemy's artillery, but not before friendly forces sustain substantial casualties.
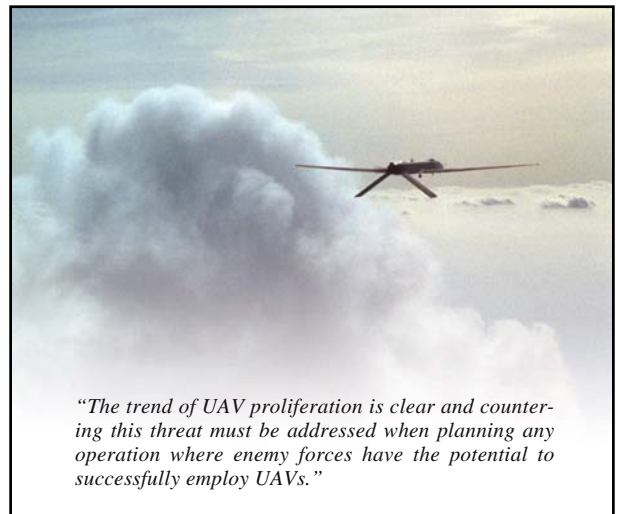
The U.S. Army Training and Doctrine Command has led the way in thinking about the future characteristics of the Objective Force. In their Objective Force Organization and Operation, they have described a full-spectrum force, organized, manned, equipped, and trained to be more strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable across the entire spectrum of military operations. We will, "*See First, Understand First, Act First, and Finish Decisively.*" This concept describes our ability to maneuver out of contact and strike at a time and place of our choosing. Critical to this concept is our ability to see first.

The Threat

UAVs are aerial vehicles that do not carry a human operator, but can fly autonomously or be piloted remotely and can be either expendable or recoverable. There are two categories of UAVs, drones and remotely piloted vehicles (RPVs). Drones operate autonomously via an onboard computer with the flight plan preprogrammed before launch. As its name suggests, the RPV is remotely piloted via datalink. A UAV system usually consists of one or more aerial vehicles with associated sensor or other types of modular payloads; a GCS, including equipment to control the aerial vehicle and its payload, as well as process data received from it; a ground tracking unit (sometimes collocated with the GCS) for aerial vehicle command, control, and datalink transmissions; and aerial vehicle launch, recovery, and support equipment. UAV missions range from 30 minutes to 5 hours in endurance with an average operational radius of out to 100 km. By 2016, typical UAV endurance will be 24 hours or greater, and the operational radius will increase to greater than 250 km. Current UAV sensor payloads are primarily limited to day only electro-optic (E/O) and limited infrared (IR) capability. The use of daylight E/O, night-capable thermal imaging, and all-weather capable synthetic aperture radar (SAR) will be widespread by 2016. UAVs are currently in more than 50 countries and their effectiveness demonstrates that number is expected to grow to more than 60 by 2016.

Tactical level reconnaissance, surveillance, and target acquisition (RSTA) systems currently dominate UAV inventories, but specialized systems that can perform electronic support/attack and lethal attack missions are emerging and will be typical UAV capabilities in the future. Posed against the Objective Force in the year 2020 and beyond, the adaptive threat using a systemology approach will most likely invest significant resources to produce or acquire UAVs that will locate, designate, attack, and degrade the Objective Force's capabilities. Fighting a highly mobile, lethal, and maneuverable foe, the threat will devote strategic and operational assets to deny unit(s) of employment (UE) access into theater. If unsuccessful, threat commanders will employ tactical UAVs and unmanned combat aerial vehicles (UCAVs) to deny blue force commanders a common operational picture. Moreover, UAV precision munition, electromagnetic pulse, and electronic attacks against command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) will be intended to significantly reduce the blue force's targeting effort, adversely affect blue tempo, and consequently deny the Objective Force the ability to mass the effects of their battlefield functional areas (BFAs).

Countermeasures

In terms of effective current countermeasures against UAVs, there are both passive and active tactics and techniques. UAV countermeasures include employing camouflage, concealment and deception (CCD) techniques; intercepting and destroying the UAV by air- or ground-based fire before it launches or during its flight; destroying the GCS and/or datalink antenna controlling the UAV; jamming the UAV's ground-to-air or air-to-ground datalink signal to its GCS; or intercepting, acquiring, and exploiting the UAV's datalink signal.

Passive Countermeasures

Returning to our original vignette, another task force S2 in the same brigade has determined the threat to have a significant day/night RSTA capability through employment of their UAV systems. Understanding this capability and its effect on friendly maneuver, the S2 recommends passive countermeasures to the TF commander and S3 to disrupt

"In response to this significant medium-range threat, such as UAVs, UCAVs, and tank-killing attack helicopters, air and missile defense (AMD) forces are now developing a system called surface launched advanced medium range air-to-air missile (SLAMRAAM)."

Photo courtesy of Raytheon

the enemy's target acquisition process and thus increase unit survivability. Passive countermeasures for night offensive operations against threat UAV infrared sensors include dispersing vehicles, terrain masking movement, using camouflage nets and natural vegetation for concealment, rapid movement across open areas, movement in stages from one natural screen to the next, and using smoke at critical crossings and chokepoints.

Active Countermeasures

At a higher echelon, the division G2, having identified the enemy's center of gravity as their robust and highly effective system of fires (to include chemical delivery), readily understands the importance of the UAVs as a targeting combat multiplier to support the enemy's most probable and most dangerous courses of action. The G2 identifies enemy UAV systems as a high value target and ensures that it is prioritized accordingly in the collection plan, information operations (IO) plan, and the attack guidance matrix.

Assuming that the GCS is within range, field artillery attacks of UAV GCS are a potent countermeasure to UAV operations, but accurate templating and proactive targeting are difficult as launch and GCS sites have few identifying factors. Signal intelligence (SIGINT) provides general localization of a ground station based on the associated signals from the station, but are rarely accurate enough to support fire missions expected to achieve a significant probability of damage to a point target. Harassing fire missions could be conducted with SIGINT as the primary source, but the chances of success would be highly dependent on the discipline of the GCS operators and the perceived density and proximity of munitions impact. In any event, the effect would be temporary and the threat would reappear at some point in the future. In this scenario, with the G2's guidance, the collection manager produces a plan with the necessary redundancy to target the GCS/datalink antenna. SIGINT intercept could be used to cue ground reconnaissance patrols or friendly UAVs to search out the GCS sites and provide accurate targeting data for artillery or aircraft with

neutralization or destruction highly probable.

As friendly forces have found the uplink and/or downlink, they are prepared, in accordance with the IO plan, to conduct electronic attacks against the signal. Jamming the UAV's ground-to-air or air-to-ground datalink to its ground control or data terminal station can effect a soft kill by denying the UAV operators command guidance capability and/or downlinked imagery. If the UAV is being operated as an RPV under direct flight control of a remote operator, loss of the command guidance signal can cause a hard kill to the UAV if it has no return-to-home or automatic loiter on loss of datalink signal capability. At the operational level, jamming GPS in the vicinity of operations can affect the UAV's navigational accuracy, but this action would also affect friendly GPS receivers. Another alternative is to intercept and acquire the UAV's datalink signals and use them to either see what the threat system is seeing and determine if it is imaging potential targets, or replicate the signals to surreptitiously insert false return-to-home coordinates, or turn off vital flight control systems.

Finally, destroying a UAV by any means prior to launch is highly challenging, but intercepting the vehicle in flight is feasible if air platforms are available to engage the UAV. Current ground-based air defense systems are less effective against tactical UAVs as RSTA sensors have a standoff of 10 to 20 km to the target. Unless the UAV is vectored to within Stinger range, existing short-range air defense (SHORAD) cannot engage the target. In response to this significant medium-range threat, such as UAVs, UCAVs, and tank-killing attack helicopters, air and missile defense (AMD) forces are now developing a system called surface launched advanced medium range air-to-air missile (SLAMRAAM). This system, combined with Sentinel radar, will proactively protect the force by acquiring and destroying targets, such as UAVs, at a point in the battlespace beyond the enemy's effective use of RSTA sensors. Objective

Force AMD will enforce standoff beyond ranges at which UAVs can detect, target, or attack the force.

The evolving UAV threat poses a significant challenge to all ground forces. Of the emerging combat multipliers, UAVs are unique in that their integration with existing systems requires little effort, and relative to other reconnaissance platforms, UAVs are both technologically attainable and affordable. The trend of UAV proliferation is clear and countering this threat must be addressed when planning any operation where enemy forces have the potential to successfully employ UAVs. Looking to the future, as friendly air defense capabilities develop, a battalion-sized unit dependent on passive countermeasures as the primary means to protect the force will be reduced and eventually replaced by air defense's proactive protection such as destroying enemy UAVs at an advantageous point in the friendly battlespace. Proactive protection via AMD forces will provide battlefield commanders with greater freedom of maneuver and will deny the enemy's capability to successfully execute asymmetrical attacks from the third dimension.

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The Merkava Mk 4 —
Israel's Newest MBT Enters Service

by Lieutenant Colonel David Eshel, IDF, Retired

During a ceremony in June 2002, the Israel Defence Force (IDF) unveiled its new member of the Merkava family, the Mk 4 Main Battle Tank (MBT).

The new tank, a fourth generation development of the 1979 Mk 1, which saw its first combat action during the 1982 Lebanon Campaign, includes new design concepts, which rate it among the best in the world for survivability and firepower.

According to the "father of the Merkava," retired Major General Israel Tal, who, for over 30 years, has been the driving power of this revolutionary tank design concept, "The Merkava Mk 4 being a fourth generation combat-proven vehicle, represents a quantum leap forward in modern tank design in all its parameters, protection, firepower, mobility, and combat control."

Improved Firepower

The Merkava Mk 4 mounts a new, locally produced, 120mm smoothbore gun, designed to sustain higher internal ballistic pressures and generate superior muzzle velocity, which is specified for advanced kinetic energy munitions.

The new main armament can fire all types of 120mm ammunition, including APFDS-FS kinetic rounds, high-explosive antitank (HEAT) munitions, antipersonnel/antimaterial ammunition (APAM), as well as the latest Israel Aircraft Industries-developed, gun-barrel launched, laser-homing antitank (LA-HAT) missile. The loader can feed the breech from a fully automated, fireproof revolving magazine, accommodating up to 10 ready rounds, and delivering four types of automatic ammunition for selection. The semiautomatic loading system is electrically operated and ready-round selection is controlled by a microprocessor.

The new Merkava Mk 4 design eliminates the loader's hatch, improving the loader's position to serve the gun breech while in a sitting position. A TV monitor screen, instead of the traditional optics, improves external observation. The loader also operates the 60mm mortar tubes from inside the tank. This weapons system fires HE and illumination rounds.

The tank is equipped with a modern fire control system, which includes computerized ballistic calculations and compensations for climatic changes, and internal pressure shock resulting in barrel distortion also effectively controlled by the video thermal sleeve. Special sensors monitor the precise gradient changes close to the firing sequence in the barrel line-of-sight, which can distort the ballistic angle.

Loading the breech during cross-country movement can affect crew safety. As in most tanks, the gun is stabilized in elevation and traverses during movement, but the barrel changes its elevation angle in relation to the inclined turret level. To prevent this, a new system was introduced, which locks the barrel during the loading process in a specified elevation angle for easy loading sequence, then regains its former stabilized position after the loading process is completed.

Other improvements to the Mk 4 include a dual axis gunner's sight and dual axis stabilized commander's panoramic sight, both equipped with an advanced forward-looking infrared and TV screen for day and night observation channels that contributes substantially to en-

hanced first-hit probability, surpassing the former Merkava Mk 3 (Baz) version, which already achieved remarkable gunnery standards.

A second-generation automatic tracking system (ATS), which locks on target at several kilometers range, automatically tracks moving ground targets and low-flying helicopter targets. The gunner's sight is locked onto its designated target throughout the firing sequence, irrespectively of any evasive action the target attempts when aware that it is coming under attack. The ATS is based on video output from either a TV camera (daylight channel) or thermal imaging camera (night channel).

Firing-on-the-move is conducted with an ultra-fast gun stabilizing electric turret drive system, which enables locking the sight while moving over rough cross-country terrain. An instantaneous smoke self-screening system is mounted either side of the turret.

New Tank Ammunition Used in Merkava Mk 4 Gunnery

The LAHAT round, designed by Israel Aircraft Industries, was developed to the IDF armor corps' specification. Using the semi-active laser homing guidance method, LAHAT can be designated by the firing tank crew or through external designation from ground, mobile, or airborne observers.

Firing the round requires minimal exposure in the firing position, and can be directed through the commander's sight by only maintaining LOS during missile flight, when "turret-down." The missile's trajectory can be preselected for either top attack (tank) or direct attack (helicopter) engagement. The missile uses a tandem warhead, which can defeat modern armor and reactive panels.

Another round to be introduced in Merkava is the APAM munition. Already in use with the former Merkava tanks that mount the 105mm main gun, a 120mm smoothbore version is soon to be included in the Merkava Mk 4 model. The APAM constitutes an ultimate solution to the growing threat to tanks, especially in urban warfare, where tank-killer squads lurk with modern lethal antitank weapons. The new round uses the proven concept of antipersonnel munitions based on controlled fragmentation. It deploys submunition shrapnel at defined intervals, covering a wide lethal area against soft targets. Each fragment is shaped to have enough kinetic energy to penetrate conventional body armor, or other materials.

Protection and Survivability

The principles on which the Merkava family was designed are maintained in the Mk 4, namely, enhancing crew protection and maximum survivability in high-intensity, fire-saturated combat. The emphasis on "combat" is necessary to clarify the recent terrorist incidents in the Gaza Strip, where two Merkava Mk 3 tanks were blown up, in separate attacks, by massive explosive charges, surpassing 100 kg each.

Against an explosive force of such magnitude ripping into its underbelly, none of the Merkava models, nor any other tank in the world, are designed to remain intact without compromising mobility, through abnormal weight additions, to its protective armor suit.

Designed for modern combat operations, top priority in the Mk 4 was given to enhanced protection against third or fourth generation antitank guided weapons, with special emphasis on top-attack, terminal-guided missiles. The revolutionary concept of placing the power pack in front was maintained.

To achieve maximum protection of the upper turret, the loader's hatch was eliminated in the Mk 4 design. This enables a full extent of the modular armor protective suit on the turret top without compromising the additional hatch, which had so far remained a conceptual hindrance based on the lack of alternative observation systems. This problem has now been solved.

For full perimeter defense, the Merkava Mk 4 is fitted with a latest state-of-the-art Amcoram LWS-2 laser warning system, its sensors capable of detecting incoming missiles soon after launch. The threat warning display is installed at the tank commander's station. Although details are classified, the Mk 4 is believed to be protected by a new type of hybrid armor, which can be conformed from modular elements to match specific threats. Another classified item is an advanced active full perimeter defense system incorporated with the LWS.

Enhanced survivability against fire hazards is gained through the all-electric turret-control system, which eliminates all remaining hydraulic fluid. An advanced version of the automatic fire suppression system is installed. The crew is also protected against nuclear, chemical, and biological warfare by a central high positive pressure system in the fighting compartment, also provid-

ing individual air conditioning (micro-cooling) designed for sustained combat under adverse climatic conditions.

Battle Management and Control Systems

The Merkava Mk 4 uses a new integrated battle management system (BMS) designed by Elbit Systems, which provides rapid communications networking between the tactical tank commander and his subordinate units. It enables the commander to plan missions, navigate, and continuously update situational awareness. The system also records data for operational debriefing by using the tank's Vectop digital data recorder. This records and restores sight images and observation data collected during missions. This data can be shared with other elements, using the same network with the BMS, to report enemy targets. Such a concept is rapidly becoming an essential part of the new digitized land forces integrated battlefield concept, combining armor, antitank, and combat helicopters in combined task force operations.

Each member in the Merkava Mk 4 crew has an individual flat-panel color display at his station, showing the status of systems related to his specific task. The tank gunner and commander can also monitor the respective sight images on their individual display screen. The tank commander can use his map display to navigate, orientate, and control his subunits.

Optronics Equipment for All-Around Observation

The design concept of the Merkava Mk 4 version was also based on combat experience, including high-risk close combat in urban environment, which, in contrast to desert warfare in open terrain, is extremely hazardous to tank crews observing targets from open hatches, which was traditional in the IDF's armor corps doctrine. Thus, top priority was placed in the design of a new concept, which affords continuous combat with closed hatches to all crewmembers, without impairing their full perimeter observation, at close and long ranges.

The Vectop Tank Sight System (TSS) integrates an array of video cameras installed in different positions around the tank to enable the crew to cover "dead zones" in the tank's surroundings. An array of four cameras provides complete peripheral coverage (360 degrees), and the top of the tank, including re-

verse movement, which the driver can monitor without impaired vision.

For protection against enemy fire, all the outboard cameras are imbedded in armored cases outside the tank. They provide high-resolution pictures to monitors installed in the driver's position and fighting compartment crew positions.

The optronics provide full and clear vision for the tank commander to operate under closed hatches, using an advanced panoramic sight for all-round observation. The turret machine gun can also be operated from under armor by being mounted on a circular revolving ring for automatic traverse. The commander's sight has override to the gunner's sight while data is being continuously relayed in both directions. All sights are day/night stabilized, rendering the commander's hunter/killer capability.

Propulsion and Mobility

The Merkava Mk 4 is powered by a new 1500 hp diesel engine, which improves its mobility substantially, compared to the former models, which were powered by 900 and 1200 hp respectively (Mk 1/2 and Mk 3).

The General Dynamics GD833, co-produced in the United States by GDLS and MTU (which also powers the French GIAT Leclerc), is a liquid-cooled, direct-injection engine, and paired with the Renk RK325 automatic transmission, comprises the Merkava Mk 4 power pack. It offers the best power-to-weight ratio at such weight levels (65 tons). A computer connected to the driver's panel and to the transmission system controls the engine. Field tests covered over 10,000 km in rough terrain successfully.

An auxiliary engine provides power when the tank is on "silent watch" for battery recharging and night observation, with full systems operating while the main engine is shut down.

One of the unique advantages of the entire Merkava family is its remarkable cross-country capability through its specially designed suspension system. This is typified by a powerful spring and rotary coil-spring design, differing from the double spring system used in previous Merkava Mk 1 and Mk 2 models. The Merkava Mk 3 Baz suspension is optimized for fast ride over extremely difficult terrain, like the basalt rock strewn Golan Heights.

With vertical road wheel travel of up to 600mm in diameter, the crew is given a softer ride, which reduces fatigue. The suspension meets the stringent requirements of 60 km-per-hour in rough country and reduces the impact on its crew thanks to the excellent absorption capability of the suspension system, which never surpasses g-1. In comparison tests with other vehicles undergoing the same criteria, when speed approached g-9, crewmembers suffered injuries and system malfunctions. In the Merkava Mk 3, at twice that speed, on the same test bed conditions, the g-force never exceeded g-1!

Although details are still classified, the Merkava Mk 4 suspension system also underwent additional improvement, which, combined with the new power-to-weight ratio, could even surpass the data of the Mk 3.

Retired Lieutenant Colonel David Eshel, Israel Defence Force, is a freelance journalist and serves as a defense analyst for several military journals. Following his brief service with the British Forces during World War II, he became one of the founding members if the Israeli Armoured Corps and served as a career officer with the IDF for 26 years. Educated at the French Cavalry School at Saumur, he later held various command and staff assignments and fought in all of the Arab-Israeli wars, including the 1973 conflict, when he served as the Armoured Corps' chief of signals.

COMMANDER'S HATCH from Page 5

cycle machine bearings have been developed and will improve the robustness of the system. However, with any materiel solution, it takes time to implement, but we will not let these fixes drop.

In addition to materiel changes to the NBC main system, we also need to change the actual practice of how the field uses and maintains the NBC main system. A Safety-of-Use message recently issued to the field required a 100 percent service to all Abrams NBC Systems. The services completed since August 2002 have revealed that some units are not adequately conducting PMCS and services, and that our service procedures can be improved. The "old Sarge" tells us that if you use the system — you will have a fire. As a result, many units discourage using the NBC main system. Lack of use contributes to lack of attention during PMCS and services. This practice contributes to low soldier confidence in the NBC main system. Some junior leaders no longer know what looks or sounds right regarding NBC main system use and maintenance. The operator's before operations checks remain the best indicator of NBC main system performance. Daily PMCS of the NBC main system, including running it for 10 minutes, actually helps the system self clean by expelling dirt and water that may have entered the NBC sponson. Commanders must ensure their soldiers are aware of NBC system hazards, are trained in the operation and maintenance of the NBC main system, and that they inspect their NBC systems during services to see what they look like and how they are maintained. Along with Abrams PM, we are evaluating additional service tasks that include removing and cleaning several key components, including the heat exchanger and pre-cooler, and inspecting the air cycle machine. Commanders then need to ensure that the NBC main system operation is conducted as part of training.

We are not forgetting the institutional training piece — we are assessing how our instruction for officer, noncommissioned officer, tanker, and tank systems maintainer courses contributes to preventing NBC filter fires. Keep in mind that all this investment is no substitute for attention to detail when conducting training and PMCS — maintenance is key! I am confident that the team effort of the Armor Force, the Armor Center, and our Program Manager can reduce tank fire fatalities, injuries, and equipment damage. We owe it to our soldiers to get this right — right now.

FORGE THE THUNDERBOLT!

Will the Real Logistics Integrator Please Stand Up?

Reflections for the Brigade XO

by Lieutenant Colonel Jeffrey S. Wilson and Major Michael W. Snow

The brigade executive officer is the most overworked and underappreciated officer in the brigade. No other job in the brigade requires the level of interpersonal communication ability, conflict resolution skill, resource management talent, and leadership via personality force as that of the brigade executive officer. Because he is responsible and accountable for so much and has absolutely nothing in the way of institutional infrastructure to support him, the key to the brigade executive officer's success is the initiation, development, and maintenance of an interactive and participatory staff-working environment that includes both coordinating staff group and special staff group officers.

The executive officer must understand and appreciate the contributions of the nonmaneuver battlefield operating systems (BOS) to the brigade's success, and possess the intellectual agility to leverage their capabilities to maximum effect in the brigade scheme of maneuver. Our combined 24 rotations as logistics observer controllers at the National Training Center (NTC) show us inductively that logistics BOS integration presents particularly troublesome problems for brigade executive officers, stemming primarily from a misunderstanding or the neglected role of the forward support battalion support operations officer (FSB SPO) as a member of the brigade special staff group.

U.S. Army Field Manual (FM) FM 3-90.3, *The Mounted Brigade Combat Team*, specifies supervising the brigade logistics posture as a specified task for the brigade XO.[1] To fulfill this responsibility, the brigade XO must understand what his own logistics staff officer (the S4) ought to do during the brigade planning process, and how the FSB SPO facilitates the S4's success via direct planning participation. FM 3-90.3 outlines the S4's role as that of "the principal staff officer for coordinating the integration of supply, maintenance, transportation, and services for the command. He is the link between the support unit and his commander plus the rest of the staff."[2] Among his specific duties are coordinating all classes of supply, less medical services and equipment recovery. The S4 "develops the logistic support plan to support operations" and produces the logistics estimate and service support annex to brigade plans and orders.[3] One might wonder what we need the FSB SPO for if the S4 can do all this. The fact of the matter is the S4 depends on the division G4 for certain logistic products and services and on the FSB SPO for products that directly effect tactical operations.

Although FM 3-90.3 calls the FSB commander "the BCT commander's chief logistician," he is not a direct participant in brigade planning as is the direct support artillery battalion commander in his role as the brigade fire support coordinator. The support operations officer is the de facto link between the brigade combat team and the echelon above brigade logistics infrastructure that will ensure the brigade is logistically postured for the fight. The best way to illustrate this is to clearly delineate how well a brigade level concept of support will likely satisfy the Army logistics characteristics defined in FM 3-0, *Operations*, as "responsiveness, simplicity, flexibility, attainability, sustainability, survivability, economy, and integration," with and without the intimate involvement of the FSB SPO at the brigade S4's side.[4]

This article illuminates for the brigade XO what the S4 *cannot* do for the brigade without the SPO, thereby enhancing the brigade XO's appreciation for the necessity of initiating and developing a relationship with the SPO as a brigade special staff officer.

Because the FSB's own capstone manual, FM 63-20, *Forward Support Battalion*, does not specify SPO planning responsibilities, by directing the SPO to provide "input to the brigade S4 on the brigade logistics estimate and service support annex," one cannot entirely blame the brigade XO from seeing him (and the FSB SPO from seeing himself) as an executor, rather than a planner. The SPO and the brigade XO together

may share the belief that the SPO should receive a completed plan for future combat operations to help write Annex I. The SPO, more often than not, hesitates to force himself into a brigade planning process in which he feels neither needed nor especially welcome. In most cases, this results in a concept of support that is not synchronized with the maneuver plan and lacks triggers to effectively transition from one phase to the next. The bottom line is that the brigade S4 is not truly the primary combat service support (CSS) integrator for the brigade, no matter what the FM says. Although he can integrate the efforts of CSS operators below the brigade level, he alone cannot integrate the echelons above brigade CSS assets that he does not control, but that are essential components of a successful operation. True, the S4 can identify requirements in the course of planning and pass those requirements to the FSB SPO after the fact; however, passing requirements is not the same as integrating CSS.

One might argue that CSS integration happens at the brigade level, whether or not the FSB SPO is involved in the planning process. While it is demonstrably true that the brigade S4 can and often does select tentative ambulance exchange points and brigade support area locations, and might even tentatively determine where and when a forward logistics element from the FSB might deploy to support the operation, the S4 will not truly integrate CSS into the plan. The FSB SPO will finalize the dedication of FSB and higher level CSS assets to satisfy brigade requirements, work with the FSB medical company leaders to finalize the most fruitful distribution of medical assets, and determine the dynamics of resupply to the FSB to posture the brigade for follow on missions. If we accept that CSS must be fully integrated into brigade plans and orders, and if we accept that the brigade S4 is unequipped by virtue of position to be a true CSS integrator (regardless of the technical and tactical expertise of the officer in the position), then we accept that the effectiveness of the brigade S4 will be directly propor-

tional to the level of participation of the FSB SPO during the planning process. In a very important sense, the FSB SPO is the true logistics integrator in the brigade, even though the brigade S4 is the staff officer formally charged to make integration happen.

The FSB SPO brings to the fight the ability to synchronize the current fight with future operations. Using CSS synchronization matrices, he has the ability to foresee the logistics battlefield and modify current and future operations based on decisions made during the brigade military decisionmaking process — true logistics integration. Not participating in the process will result in the FSB SPO focusing on the next 24 hours, the execution period for the FSB. The FSB SPO is unable to visualize the battlefield 48 to 72 hours in the future, which limits his ability to influence future brigade fights. The FSB SPO cannot reallocate direct support assets within the FSB, and lacks key information to make necessary coordination with echelon above brigade organizations to maximize available time to provide required support. Traditionally, we fail to accomplish these tasks, resulting in the FSB being out of position to effectively support critical brigade events. For example, the FSB attempts to move during a key period in the fight and is unavailable to support the brigade, and the FSB SPO receives an emergency request that he will have to depend on others to execute on short notice.

FSB SPOs repeatedly argue with NTC logistics trainers that they are simply too busy managing current operations to spend many hours at the brigade tactical operations center in planning sessions. We think the only way to circumvent the pressures of current operations is for the FSB commander to enable the SPO to build a team within the support operations section that can manage current operations, follow up on key issues, and even issue instructions in the SPO's name.

Doctrine writers in schoolhouses provide the rubric for success. It falls to individuals in the field to translate doctrinal guidance into specific tactics, techniques, and procedures that address recurring concrete practical problems. Sustainment doctrine tells us that brigade plans and orders must satisfy the logistics characteristics — foremost among them integration. Hopefully, this article has served to assist the brigade XO in fulfilling his responsibility to oversee the brigade logistics posture by clarifying the limits of the S4's role and illuminating the perhaps underappreciated role of the FSB SPO during brigade planning.

Notes

[1]U.S. Army Field Manual (FM) 3-90.3, *The Mounted Brigade Combat Team*, U.S. Government Printing Office, Washington, D.C., 1 November 2001, Figure 11-4, p. 11-8.

[2]Ibid., Figure 11-8, p. 11-13.

[3]Ibid.

[4]FM 3-0, *Operations*, U.S. Government Printing Office, Washington, D.C., 14 June 2001.

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MAJ Michael W. Snow is a support operations officer observer controller, A Company, Operations Group, National Training Center. He received a B.B.A. from Texas A&M University and an M.S. from Florida Institute of Technology. He is a graduate of the U.S. Army Command and General Staff College. He has served in various command and staff positions, including support operations officer, 302d Forward Support Battalion, Camp Casey, Korea; doctrine developer, U.S. Army Combined Arms Support Command, Fort Lee, VA; S3, 725th Main Support Battalion (MSB), 25th Infantry Division, Schofield Barracks, HI; and commander, B Company, 725th MSB, 25th ID, Schofield Barracks.

Seat *from Page 6*

MWSS components will consist of lightweight, modular, mission tailorable, integrated equipment, and command, control, communications, and computers (C4) devices, worn, carried, or used by crewmen when conducting tactical operations with their assigned combat vehicles. Overall design of the MWSS will achieve optimum synergy of components to decrease mission time; increase crewman mission performance, to include dismounted activities; improve comfort and endurance; enhance man-machine interface; and improve safety. Increased organizational effectiveness and improved combat vehicle lethality will be achieved through enhanced man-machine interface.

America's 21st century Army must be powerful, versatile, and able to respond worldwide with overwhelming, technologically superior force that renders any potential adversary impotent while minimizing the cost in soldiers' lives. Standing still would jeopardize our position as the world's best Army. Only by enhancing current equipment with advanced technology and providing high-quality soldiers with state-of-the-art weapons systems can the Army build a full spectrum force capable of fulfilling America's security needs well into the next century.

As you can see from this article, the future will deliver some very exciting systems. The technology that is at our fingertips will change the way soldiers will think, act, and fight. With this all said, I want everyone to remember that even with all of this technology, the individual "SOLDIER" will always be our greatest combat multiplier.

I hope all of you had a wonderful holiday season and remember, "PRIDE IS CONTAGIOUS," so get out and infect other soldiers.

I am very interested in receiving concerns, comments, and suggestions from soldiers out in the field. Please send all questions and comments to the following email address:

CSM@knox.army.mil

and begin execution of the mission. The modification comes when the enemy is not in templated positions, is on a different time-line, or is using a different direction of at-tack. For example, a unit finds that the en-emy is not in the templated position and must adjust the objective's location be-cause the commander's intent was to de-stroy all enemy vehicles in sector. Also, the unit is defending a battle position and the enemy is attempting to bypass this defense. Now the leader must change posture and move his defense to prevent enemy pene-tration of the phase line in accordance with the commander's intent. With these chang-es, we force the leader to react to a differ-ent environment than he had expected. If he possesses a firm understanding of the mission and the commander's intent, then he will react appropriately and emerge vic-torious. If not, then an AAR can be con-ducted and the unit re-cocked with yet an-other spin on the enemy situation. The idea is to engrain in the leaders that the plan is a good structure for their operations but it must not hinder mission execution.

Training is often constrained by land, mon-ey, time, and available personnel resour-ces. This may force units to conduct plan-oriented training. However, if the resources are available, then intent-oriented training should be conducted. The amount of land required for this type of training will proba-bly be larger. The boundaries of the lane need to be sufficiently wide to allow a lead-er and/or the OPFOR to react or maneu-ver in a rapidly changing environment. The amount of time needed to train a unit will probably increase as well. This is due to both the need for retraining and the amount of time it will take leaders to develop frag-mentary orders. The bottom line is the way the lanes are resourced and planned will change slightly.

Despite the ease of the transition to this new model, we cannot abandon the old model completely. There is definitely value in the old methodology. Units need the struc-ture of the old lanes when key leaders have turned over or a large period of time has lapsed since the last training event on this mission. Units and leaders need to ramp up to the new level competence before begin-ning intent-based training — envision the old system as the crawl and walk phases and the intent-based training as the run phase.

In conclusion, we want leaders who can react and apply doctrine appropriately in nondoctrinal situations. The only way to re-alistically prepare leaders for this task is to place them in these situations during train-ing. I believe that if we can get to this in-tent-based training method, we will more effectively prepare our leaders and units for mission accomplishment.

CPT PAUL MAXWELL
U.S. Military Academy
West Point, NY

Books Are Available On Additional Battles

Dear Sir:

I wish to make a correction to the book review in the September-October 2002 is-sue of *ARMOR* on *Battleground Europe: Cambrai - The Right Hook* by Major Joseph McLamb. I heartily agree with Major McLamb that these superb, compact books are a "staff ride in a can;" the books, however are not limited to World War I. The Pen and Sword Books of the Leo Cooper Publishing house are available for the *Utah Beach and the Airborne Landings*, *Omaha Beach*, the British and Canadian Landings at *Gold*, *Sword*, and *Juno*, *Pegasus Bridge/Merville Battery*, *Nijmegan*, *Hell's Highway* (the Ad-vance of British XXX Corps in Operation Market-Garden), *The Island* (the fighting in the Betuwe area between the Rhine and Maas rivers south of Arnhem in October-November '44), and *Arnhem*. I can person-ally recommend them as I used all of the aforementioned titles in a staff ride that I conducted with friends in September 2002. The time and money spent purchasing and reading these books was well-spent and invaluable preparation for my comrades and I. I would like to add to Major McLamb's en-dorsement that the books greatly aid in nav-igating in European traffic and contain tips about insurance and local laws and cus-toms. The books are also extremely useful as a reference guide to other books as they are well illustrated and contain precise, per-tinent maps that so many other histories lack. Another is also available on the de-struction of the U.S. 106th Infantry Division in *St. Lo* that I found useful.

SCOTT C. FARQUHAR
LTC, Infantry
Hohenfels, Germany

Rescind Environmental Constraints

Dear Sir:

For more than 10 years, I have routinely been disgusted with the environmental re-strictions placed on units training in federal-ly owned training areas. I have experienced and have heard of some pretty ridiculous constraints that have us injecting our train-ing events with farces such as "DeGama Lakes" at Fort Bliss, and "politically sensi-tive red-cockaded woodpecker nesting ar-eas" at Fort Stewart. I have been angered that training stops at Pinon Canyon when it rains. I have been incensed that soldiers are not allowed to "neutral steer" armored vehicles at Fort Stewart or Pinon Canyon.

So now, the United States has been at-tacked. The commander in chief says to everyone in uniform, "Get ready." We are standing on the precipice of certain war. So now what? Well, we will continue to do what we've been doing for years… preparing to fight our country's wars. Everyone I know in uniform who has heard our president's call has a cold feeling gnawing deep in their gut knowing that we are the ones who are go-ing to have to take the fight to the enemy. We are the ones who will make the ene-mies of freedom pay for their crimes. We are the ones who will spill our own precious blood if necessary.

I am making an impassioned plea for an end to the environmental constraints placed on our preparations for combat executed in our nation's training areas. I can think of no greater time to end these restrictions that may very well cost the blood of our soldiers in combat. We need to train our soldiers under all conditions without being con-cerned about causing damage to the eco-system.

I ask you, what is more valuable, the life of the soldier or the ground he trains on? I argue that human blood is infinitely more precious than the fauna, flora, or any spe-cies of animal life living on that ground. Anyone who argues otherwise cheapens the value of human life and subverts the cause of liberty and freedom.

There are no units in the United States military that are environmental "terrorists." No units purposely defile their playing field for the sake of thumbing their noses at the environmental establishment. We have ex-ercised good faith in being environmental stewards; we have followed the rules in our supply rooms, arms rooms, motor pools and, yes, training areas, often by the threat of action by our fellow government agen-cies. We have never once threatened to leave them on their own to defend our country. Instead we have submitted and, as a result, have watered down our training just a little here and there to comply.

The time has come in our country's hour of need to rescind these petty restrictions, which are meaningless when compared with the lives of our country's sons and daughters. We can no longer afford to sac-rifice the quality and demands of realistic training for the sake of the environment — a sacrifice that may equal a sacrifice of men and women in the impending war.

CPT PATRICK M. COOLEY
A/1-409th Cav (TS)

Correction

The following corrections pertain to the TASS Armor Battalions section of the Na-tional Guard Unit listing, November-Decem-ber 2002 issue, page 51.

The commander of Region A, 1st Armor Battalion, 254th Regiment is LTC Huggard. The senior instructor is MSG Beierschmitt.

The commander of Region C, 1st Armor Battalion, 218th Regiment is LTC Brooks and the chief instructor is MSG Long.

REVIEWS

The Iraqi Threat and Saddam Hussein's Weapons of Mass Destruction by Stephen Hughes, Trafford Publishing, Victoria, Canada, 2002, 436 pp., $29.95 (soft cover).

"It is better to act quickly and error than to hesitate until the time of action is past." – Karl von Clausewitz (1832). Clausewitz could be describing both the benefits and drawbacks of this book and its "on-demand publishing" method. *The Iraqi Threat* is hopefully just the beginning of a new surge of specialized publishing for the military audience.

The author, a former Black Horse cavalry scout with an extensive military research background, used his expertise and experience to write a reference book specifically aimed at a military audience, and then had it published nontraditionally. By gathering public information, along with recently unclassified military and government intelligence, the author compiled a single source document. Due to the technical nature of the book and its narrow target audience, it is doubtful that a traditional publishing company would have taken the financial risk of this publication.

The book is an intelligence officer's primer into the Iraqi military at all levels. Covered in depth are the regular Iraqi army, the republican guard, air force, special operations forces, and other specialty units. In light of current world events, the book covers in great detail the Iraqi al-Qaeda connection and other terrorist links, as well as provides in-depth investigations into the Iraqi nuclear, biological, and chemical warfare programs.

Rather than providing a list of numbers and equipment types, the author explores the expected tactics, techniques, and procedures that are used by the Iraqi military. The type and use of chemical weapons is fully documented, which includes past use and any potential use of these weapons by Saddam Hussein. More importantly, the effects of each type of munition are detailed. Nuclear weapons are also reviewed, including their expected effects, delivery systems, potential targets, and limitations.

The author analyzes conventional weapons systems and equipment in great detail. By doing so, this should allow both officers and noncommissioned officers to appreciate the content and its applicability. The book describes unit distribution, effective ranges, and techniques of use for all weapons ranging from rocket-propelled grenades to antitank guided missiles. These are broken down into different categories, including missile systems, armored vehicles, artillery systems, and antitank weapons.

On-demand publishing allowed the author to quickly compile essential military information and publish it with very few delays. The rapidity of publishing, along with the ability to print a book to a targeted audience, is critical to transmit time-sensitive information in today's uncertain world environment. However, it is important to note that the ease of publishing can also be a downfall due to the lack of editorial support that comes with a larger, more traditional publishing house.

The book lacks professional editorial review, graphics, in-depth footnotes, and organization. This inhibits ease of reading making the text difficult to follow at times. In addition, the information within the text is occasionally contradictory without proper explanation or discussion. Therefore, the reader is left to wonder which source of data is truly accurate.

Overall, the book is an outstanding tool for training and educating various U.S. military forces. It should be required reading for all intelligence and combat officers in the current threat environment as it is an incredible source of information on the Iraqi threat. I look forward to a second edition that would eliminate the distractions listed above. In conclusion, I recommend that combat leaders purchase this book and, more importantly, use the new medium, on-demand publishing, to write their own books to further educate and develop the military community.

MAJ DEREK C. SCHNEIDER
Owensboro, KY

Fires of Hatred: Ethnic Cleansing in Twentieth-Century Europe by Norman M. Naimark, Harvard University Press, Cambridge, MA, 2001, 248 pp., $24.95.

Naimark's *Fires of Hatred* is a fascinating study of how ethnic cleansing has become standard practice in much of the developing and post-communist world. Ethnic cleansing led directly to the United States' involvement in Bosnia, Croatia, and Kosovo. The ethnic cleansing we have seen in the late 20th century has strong antecedent roots easily traceable to the early 20th century. The National Command Authority increasingly relies on the Army to serve as a buffer during stability operations and support operations often as a deterrent against ethnic cleansing. The officers and noncommissioned officers that will carry out these missions must have more than just an historical sense of ethnic cleansing, but also an understanding of the conditions and preconditions necessary for it to happen. A reading of Naimark's book will enable the reader to grasp the broad outlines and preconditions necessary for ethnic cleansing. The book is easily readable, understandable, yet written in a compelling style. The historic examples Naimark chooses and his writing clarity make ethnic cleansing, a complex and horrific subject, understandable.

Naimark's central thesis is ethnic cleansing, which is dictated by modern nationalism and becomes mutated by the ideas and politics of modern nationalism. He makes a compelling argument that without the advent of the modern industrial state, ethnic cleansing would be more of a spasmodic and episodic event rather than one that permeates into a culture of hatred and death. The rise of industrialism allowed the modern nation state to easily track, organize, and define that state and society in terms of ethnic criteria.

Naimark chose five examples from modern Europe as his case studies, as European history is his area of expertise, serving as a professor of East European Studies at Stanford University. Naimark is well credentialed to examine his chosen examples: the Armenian genocide in 1915 by the Ottoman Empire; the expulsion of the Greeks from Anatolia during the 1921-22 Greco-Turkey War; the events leading up to the Holocaust; post-World War II events in Poland and Czechoslovakia; and Soviet deportation of troublesome ethnic groups/nationalities under Stalin and Yugoslavia during the post-Tito era.

Early in his writing, Naimark gives the reader an easy and clean definition of ethnic cleansing by first disabusing the reader that ethnic cleansing is by nature genocidal. Naimark defines ethnic cleansing as "the forcible removal of a minority group or a distinct ethnic group that is seen as hostile to that nation state." One could argue that ethnic cleansing can be seen in the roots of Wilsonian self-determination. The intent of ethnic cleansing is to remove a group of people and all traces of them, including their street names, monuments, and cemeteries.

The goal is to obliterate and erase all traces of those people from the land. The goal of obliterating all traces of the singled-out people often becomes genocidal in effect. Naimark notes, with some irony, that ethnic cleansing's greatest proponent in all these examples is the nations states' professional class — the lawyers, doctors, engineers, and professors. A good example is SS General Otto Olendorf, a noted barrister who, as commander of an Einsatzgruppen in the Soviet Union, murdered thousands in the name of racial purity.

All ethnic cleansings seem to possess certain characteristics, such as war, the transitory period after war to peace, religious differences, major cultural differences, ideologies, and the destruction of the historical past, which are intrinsic to the very nature of these "population transfers." Naimark pointedly states that no matter what the initial intent of ethnic cleansing is, it invariably involves violence. Each case study indicates these actions usually single out women and children by armed groups whose abuse turns into a frenzy of horror — unmarked graves, repeated gang rapes to impregnate the ethnically cleansed women, and torture. Rape serves to put the group on notice that the women are seen as chattel and that the men are powerless to protect their women.

War serves as cover for ethnic cleansing as shown by the Holocaust in Eastern Europe. The state of national emergency engendered by war often leads to the suspension of normal civil behavior and a disregard of law. Armies have become involved, but paramilitary and nationalistic groups seem to carry out this cleansing with a greater vengeance. Naimark unilaterally states that armies are routinely involved in this, but the research of his book does not readily support that assertion.

The destruction of the past is done to eradicate the memory of those who occupied the land before, much like the revision of history in Orwell's *1984.* In Chechnya, the Soviets bulldozed graveyards and used gravestones to pave roads. Homes are systematically razed and the cultural infrastructure dismantled — libraries destroyed, street names changed, and the language forbidden. American soldiers have found out how difficult this is — they rebuild an area during the day and at night, the dominant group will try to destroy the rebuilt areas.

Naimark does not see a great deal of hope for the future. He believes the concept of noninterference in the internal affairs of other sovereign nations contributes immeasurably to ethnic cleansing, without conversely recommending any mechanism within the current international order that can act to prevent and stop ethnic cleansing. Further, Naimark is somewhat off base in his assertion that the West's failure to bomb the rail lines that ran into the camps during World War II would have made a difference. Any logistician knows how easy it is to repair rail lines, but perhaps from a moral standpoint, Naimark makes a point. Naimark ends with the hope that American and international intervention against the Serbs has turned the tide, however, most of the ethnic cleansing under Milosevic occurred once concerted action had been taken against him. I readily recommend *Fires of Hatred* for any unit's bookshelf, as it serves as a primer to readily understand ethnic cleansing for anyone that could be deployed outside the continental United States to an area ravaged by ethnic cleansing.

MAJ ROBERT G. SMITH, USA
Germantown, MD
Commander, MHD TF EAGLE
Operation Noble Eagle

Warrior Politics: Why Leadership Demands a Pagan Ethos by Robert D. Kaplan, Random House, New York, 2002, 198 pp., $22.95 (hardcover)

The future of warfare and global governance is behind us. In *Warrior Politics,* Robert Kaplan highlights major classical and contemporary readings of warfare and international relations to provide the framework for future foreign policy decisions. Kaplan's focus for this framework is not on utopian ideals, but on the reality of man's brutality.

Kaplan asserts that the reality of man's brutality is war. Moreover, war is subject to democratic control only when it is a condition separate from peace. He proposes that future wars will be unconventional and undeclared, fought within states rather than between them. He reasserts LTC (Ret.) Ralph Peters' idea that our future enemies will not be soldiers but warriors without material risk or a stake in civil order. Those cultures that do not compete well technologically will produce these warriors. These warriors will not be fragile to conventional warfare.

Therefore, Kaplan predicts that going to war will be less and less a democratic decision. He suggests that small groups of civilians and general officers will make the decision to use force. He asks what democratic restraints will remain on the resort to force.

Robert Kaplan is a correspondent for the *Atlantic Monthly*. He is the well-published author of *Balkan Ghost, The Coming Anarchy, The Ends of the Earth,* and *Eastward to Tartary*. A journalist by trade, *Warrior Politics* is an easy read. His firsthand experience in recent crises form a valuable base for his writing.

His intention of not making it a lesson on the classics themselves, but on their relevance to today and tomorrow's foreign policy dilemmas, makes this an accessible read to all. For those who have read *Thucydides*, *Sun Tzu*, *Machiavelli*, *Hobbes*, *Churchill*, or the others highlighted by Kaplan, it offers a contemporary perspective on the classics. For armor soldiers, it highlights the importance of reading military and political history.

1LT JOHN P.J. DEROSA
1-77 AR BN
Schweinfurt, GE

Allies at War: The Bitter Rivalry Among Churchill, Roosevelt, and De Gaulle by Simon Berthon, Carroll & Graf Publishers, New York, 2001, 356 pp., $26.00 cloth.

Scheduled to be a BBC/PBS television series, *Allies at War* explores the discord the world did not see hidden behind the allied leader's united front. Franklin D. Roosevelt, Winston Churchill, and Charles De Gaulle held the destiny of the Free World in their hands as Nazi forces stormed through Europe in the 1940s. Inspiring their troops and their nations with confidence in victory, these three statesmen stood firmly together against the axis powers in public. In private, however, their relationships were marked by contention, distrust, duplicity, and ruthlessness.

Berthon neatly traces the steadily escalating political environment that made the disputes inevitable. Roosevelt was a rigid anti-imperialist. Aside from defeating the enemy, his long-term aim was to disband all of Europe's empire, including the British and the

French. Churchill, caught in the middle, was determined to preserve the British Empire and resist the Nazis, but had to have the cooperation of his two allies. De Gaulle fanatically wanted to regain all of France and maintain her empire as it had been before the Nazi occupation and the Vichy collaborator government. In his view, cooperation was secondary to his main goals. Opposition between the three increasingly eroded negotiations that not only significantly colored allied policy during the war, but also colored relations of De Gaulle's France with Britain and America.

With the fall of France in 1940, the Nazis would occupy two-thirds of the country and the remaining one-third would be governed by the collaborating new state based at the Spa town of Vichy. Two Frances would emerge, the Vichy France and the Free France of De Gaulle. Vichy France broke off relations with Britain in July 1940 when the British navy attacked a portion of the French fleet at Oran in Algeria to end the possibility of it falling into German hands. Not yet in the war, the break with England made it more important for the United States to maintain relations with Vichy France. This was an effort to reduce Germany's influence to a minimum, prevent the surrender to the Axis of the French Fleet or French bases in Africa, and serve as a channel of intelligence to Axis plans and activities. De Gaulle, starting from nothing in England, gradually built up the forces of the Free French, but could not convince his allies that France could be restored to the status of a major power.

Prime Minister Churchill and President Roosevelt so doubted the loyalty of General De Gaulle that they kept the Anglo-American invasion of North Africa a secret from him, as well as the Normandy landings, and excluded him from the Yalta Conference. Nevertheless, De Gaulle had 1,300,000 men under him at the end of the war. This earned him a place in the peace settlement, with a little help from Churchill. Britain knew that France would be a power to reckon with during the post-war period. Prophetically, Charles De Gaulle would become President of France. He lost no opportunity to chastise the United States and even blocked Britain's early attempts to join the European Common Market. This legacy, that affected both Britain and the United States at crucial points of their post-war development, is rooted in the extraordinary relationships between three titanic figures that became allies at war.

This clearly written and solidly researched work would have been enhanced by footnotes or more extensive endnotes. It would also eliminate confusion for the reader if foreign phrases were translated. Nevertheless, this book has much to offer for those interested in international relations.

DENVER FUGATE
Radcliff, KY

No End Save Victory: Perspectives on World War II edited by Stephen Ambrose and Robert Cowley, Berkley Books, New York, 2001, 688 pp., $16.95.

Robert Cowley has compiled an outstanding collection of essays about World War II into a single volume that will impress both the general reader and the military historian. *No End Save Victory* consists of 46 essays written by such prominent military historians as Stephen E. Ambrose, John Keegan, Robert A. Doughty, Alistair Horne, and Caleb Carr. Interspersed among these authors are several firsthand accounts by American, British, and Japanese participants. Cowley has assembled works from nearly all aspects of World War II to include the European Theater, Pacific Theater, Africa, Russia, the Far East, and an interesting collection of biographies.

By far, this book's strength is not simply rehashing stale essays on World War II; it contains new insights, new material, and completely differing perspectives on events. The book is not a definitive history of World War II, nor is that the editor's intention. It is not an anthology of well-known events, such as Guadalcanal, Stalingrad, and Bataan, but includes several accounts of many lesser know events, actions, and personalities of World War II. Anthony Bailey provides an interesting perspective on Dunkirk by presenting it as a success, rather than a failure. Caleb Carr writes a masterful essay on Field Marshal Gerd von Rundstedt, while Stephen Ambrose gives an excellent account of bridging the Rhine. Likewise, "The Right Man," by Victor Hanson shows the controversial figure of General Curtis Le-May in a much different light than that of which most readers are familiar. However, some of the more interesting articles are about the lesser know events such as, "Decima Mas," about an Italian unit specializing in naval sabotage, and "Beachhead Labrador," which is an account of the only landing on North American soil by the crew of a German U-boat.

Some may criticize the book for its lack of comprehensiveness or varied writing styles, however, I find it difficult to find any fault with this book; it is interesting, captivating, and informative. Cowley has comprised a wonderful collection that is highly readable, and difficult to put down once started. I would recommend it for everyone from the professional historian to the casual reader.

JOHN M. KEEFE
LTC (Ret.)

Eisenhower: Soldier-Statesman of the American Century by Douglas Kinnard, Brassey's, Inc. Washington D.C., 2002, 98 pp., $19.95.

Douglas Kinnard has done a masterful job of covering the entire life of one of the greatest 20th-century Americans in only 98 pages. Part of a series of military profiles, including those of Farragut, Santa Anna, Drake, and Semmes, edited by Dennis Showalter, *Eisenhower: Soldier-Statesman of the American Century* is an excellent source for anyone. Kinnard has managed to condense Eisenhower's life into a very readable, concise, accurate, and brief book that provides the reader with everything most people will ever want or need to know about Dwight David Eisenhower. Not necessarily a book for the serious student of history or the military professional, but an outstanding overview of an intriguing career of a great American that are useful to most people, including youngsters.

Eisenhower's early days in Abilene and his attendance at the U.S. Military Academy are covered in sufficient detail to paint a picture of the last U.S. President born during the 19th century and capture the reader's attention. From Eisenhower's lack of opportunity for combat service during World War I and the death of his first child, to his education and mentoring by Generals Fox Conner, MacArthur, and Marshall, lead to his commanding U.S. forces in Europe in World War II — arguably the highest point in his career. His post-war service as Chief of Staff of the Army, president of Columbia University, and SACEUR are covered, but only as a lead-in to his presidency or as waypoints along the road to the White House.

The last third of the book covers the Eisenhower presidency, or waging of peace. Serving as the first Republican president in 20 years, "Ike" was a strong, active, and effective president during what was one of the most dangerous decades of the Cold War. In January 1961, Eisenhower, the oldest person to have served as president, was succeeded by John F. Kennedy, the youngest ever elected to that office. He then retired to his farm at Gettysburg, wrote four books, advised presidents, and died on the 28th of March 1969. Kinnard points out that when Mamie was asked what she would like people to remember of Ike, she answered, "His honesty... integrity, and admiration for mankind."

DAVID L. FUNK
BG, USA (Ret.)
Montgomery, AL

Wellington As Military Commander by Michael Glover, Penguin Books Ltd., London, England, 2001, 276 pp., $15.00 (soft cover)

A master military leader is once again brought to light with the reissue by Penguin Books of *Wellington as Military Commander*. Written by the well-known Napoleonic and Victorian warfare expert Michael Glover in 1968, *Wellington* explores the vast military career of Sir Arthur Wellesley (later the Duke of Wellington), from his initial military service in India through the Peninsular campaigns and climaxing with his defeat of Napoleon at the Battle of Waterloo.

This gripping narrative pays tribute to the outstanding leadership skills of Wellesley. Glover does a very thorough job of describing the trial and tribulations that the British icon faced during his time of command in both the Peninsular War and the 100 Days War. From working with the confusing bureaucracy of the British government to leading allied armies, Wellesley's ability to make the best of any situation made him one of the best generals of his time. In the age before cell phones, fax machines, and e-mail, Wellesley made numerous critical decisions, like pursuing French forces from Portugal into Spain in 1812. His ability to take calculated risks enabled him to succeed on the battlefield and win the respect of his men.

A major strength of the book is Glover's ability to intersperse the action of conflict with quotes from the common soldier and Wellesley himself. Of particular note is Glover's ability to present the relatively unknown compassionate side of Wellesley. Several excellent quotes support the author's contention that Wellesley was not a detached general consumed with victory at any cost, but rather a man who wanted to commit troops when absolutely necessary. Glover further highlights Wellesley's genius by focusing the latter half of his book on the offensive, defensive, and siege campaigns that resulted in victories for the allied effort in Portugal and Spain.

The main drawback of this book is the lack of detailed maps, particularly of the many battles during the Peninsular War. I found myself constantly referring to my atlas of Europe, especially the Iberian Peninsula, when Glover named the various cities and towns encountered by Wellesley and his armies from 1809 to 1814. Also, Glover's first chapter forces the reader to endure a confusing tour through the British military and government bureaucracies of King George.

Wellington As Military Commander is an excellent biography of a man whose keen military intellect influenced much of Europe during the early 19th century. This book is a great companion piece to *Wellington And His Army* by Godfrey Davies, especially for those leaders interested in the inner workings of multinational armies. While some leaders of today may refrain from reading a book about a 19th-century general, I contend that many valuable lessons can be gleaned from this work. Triumphs in the face of adversity, leading from the front, and looking out for soldiers are but a few that I found. This book is a great addition to any armor or cavalry leader's library.

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

War is fighting and operates in a peculiar element – danger. But war is served by many activities quite different from it, all of which concern the maintenance of the fighting forces. These preparatory activities are excluded from the narrower meaning of the art of war – the actual conduct of war, because they are concerned only with the creation, training, and maintenance of the fighting forces. The theory of war proper, on the other hand, is concerned with the use of these means, once they have been developed, for the purposes of the war.

– Carl von Clausewitz