

ARMOR



KOSOVO: The Serbs Pull Out... Now What?



Saddle Up... Tonight We Ride

Graybeards may recall that, back in the olden days, officers were sometimes gathered together and asked (usually by someone of greater rank who also happened to be in everyone's rating chain), "Who is a member of (insert organization here)?" Non-members were then offered the opportunity to sign up with the battalion S1, who lurked in the back of the room, proper forms at the ready. I'm sure the same sort of arm-twisting went on for the noncommissioned officers and soldiers, but we don't do that anymore (or shouldn't). The United States Armor Association must rely on its own devices to gain your support.

Why join the association and subscribe to *ARMOR Magazine*? Can't one simply read the free unit copy of *ARMOR Magazine* or the web page? In regard to the free or unit copy, the race is to the swiftest, and you won't see the most current issue of *ARMOR Magazine* on the web page — that makes little sense. We are slowly but steadily adding back issues to our web page but will never post the current issues; few publications do.

Join and support the association today because, quite simply, it's the right thing to do. *ARMOR* is our professional journal. Professionals publish and communicate through journals to improve themselves and the profession. It was for this reason that in November of 1885 a group of cavalry officers met at Fort Leavenworth to establish what would become the Armor Association. In March of 1888 they published the *Journal of the U.S. Cavalry Association* (in 1946, it would become the *Armored Cavalry Journal* and *ARMOR* in 1950). I'm glancing over quite a bit of history in this short summation (for a complete history of the magazine and association see the November-December 1973 issue of *ARMOR*), to illustrate that the association and magazine have been tied together for over 111 years.

Currently, over 4,500 members comprise the association sharing the same stated goal: "to disseminate knowledge of the military art and sciences, with special attention to mobility in ground warfare; to promote the professional improvement of its members; and to preserve and foster the spirit, the traditions, and the

solidarity of Armor in the Army of the United States." The association is a non-profit organization that reprints *ARMOR Magazine* for its members and administers an aggressive awards program that recognizes the very best cavalrymen and tankers and those who support them.

I've heard the excuses for not joining, most arguing that frequent moves hinder delivery of the magazine. Frankly, that dog won't hunt! The association has a web page, www.usarmor-assn.org, so if contacting the association via the phone, fax, or mail to change an address is too difficult, one must simply log on to the web to accomplish this daunting task.

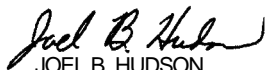
With my sermon complete, I'd like to point out that the business of scouting and cavalry are on the minds of the mounted force — a fact reflected in this issue of *ARMOR*, which devotes a great deal of space to the various debates ranging in our community. Major Todd Tolson begins by describing the Future Scout/Cavalry System design process. Tolson details many of the factors involved including: the joint U.S./U.K program, the wheel versus track debate, and capability issues. You'll also see topics that LTC Mark Reardon wants addressed in upcoming editions of *FM 17-95*, and Mr. Stanley Crist's argument for an airmobile, amphibious scout vehicle. CPT Bill Williams makes a pitch for a battalion scout troop, and you'll see 1LT Thomas Brennan's article outlining 4th ID's scout-COLT integration. We conclude scout/cavalry theme with a short piece describing the agreement between the Dutch and Germans to build the "Fennek" Light Reconnaissance Vehicle.

With that said, the most telling scout prose may well be found in a letter written by one of those guys we expect to dismount from a scout vehicle to answer our burning questions and protect the force. It seems most of the published debates center on protection versus weight/aircraft deployable or stealth versus fightability, etc., but until the good sergeant wrote, few had voiced the concern of those who must climb in and out of the platform — well said SGT Thacker (see Page 18). — D2

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LETTERS

Despite Acquisition Delays, We Need to Train Soldiers

Dear Sir:

I was dismayed to read Mr. Potter's reaction to C/3-81's use of the BEAMHIT device for rifle marksmanship (Mar-Apr '99 *ARMOR* letters). However, I am less concerned with acquisition regulations and bureaucratic turf wars than I am with training soldiers to use their personal weapons. The soldiers our NCOs train today will serve in Korea and Bosnia tomorrow. They deserve the best training we can provide them, not excuses as to why the Army's procurement system is slow and unresponsive. My predecessors and their commanders understood that soldiers come first. When it became apparent that the old Weaponeer 66 wasn't providing the quality of training our soldiers deserve, they found a cheap, reliable training aid to use until the "system" could get around to sending us one. In fact, until C/3-81 AR procured the BEAMHIT training device, the Army's incoming 19K soldiers had no training device at all for the 9-mm pistol. Were it not for the initiative of the NCOs and leadership of 1st Armor Training Brigade, our soldiers would still be doing "pencil drills" and dry fire as their only train up for pistol qualification.

C/3-81 AR fully understands that Ft. Benning is the proponent for BRM and BPM, and we follow the programs of instruction (POI) they have developed religiously. However, when training our young soldiers demands additional effort, funds, or ingenuity, we must meet that challenge. As officers and NCOs in the United States Army, we have the responsibility to take care of and train soldiers. Even down at brigade, battalion, and company levels, we as leaders are expected to make the right decision. Any regulation which prohibits that fundamental truth needs to be changed or discarded.

The use of the BEAMHIT trainer is in addition to approved training devices, and in no way detracts from the program of instruction. The soldiers in BCT and OSUT here at Ft. Knox require training NOW, so we don't have the luxury of waiting until the latest training device winds its way through the acquisition channels. This fact becomes painfully clear with the recent cancellation of funds for the EST training device. Once again, a promised system is pushed ever farther into the future, leaving our drill sergeants and instructors with the duty of training soldiers today. Soldiers win our nation's wars. They must come first, before regulations and before bureaucracy.

CPT JOHN OLIVER
Commander, C/3-81 AR

Both Teams Learned From Light/Heavy Rotation

Dear Sir:

I am very pleased to see that the armor community is turning an eye to training in a

MOUT environment. As a light infantry company commander in the 1st Bde, 25th ID, we (1-5 IN Bobcats) trained with 1-33 Armor, 3rd Bde, 2 ID at Ft. Lewis in preparation for a light/heavy JRTC rotation. This training took place from August '97-November '97.

Both the armor and the light infantry developed numerous TTPs during our training. The forces walked away from the training with new respect for each other's abilities, and would desire each other's assistance during a future fight.

At Regenburt (Ft. Lewis' MOUT site), we trained in the MOUT site with armor. Some of my observations:

- Tanks not only add a great deal of firepower to the fight, but also physical cover to infantrymen when crossing danger areas.

- In the restricted terrain of a MOUT environment, it is very difficult for tanks to work as a section, let alone at platoon level.

- The most effective TTP we developed was to attach a tank to an infantry platoon. With the light infantry platoon's squad leaders speaking directly with the tank via FM, on the infantry platoon net. The tank platoon vehicle was kept in reserve under the control of the light infantry company commander.

- Tanks must be OPCON to an infantry company due to the inability to logistically support them.

- Tanks can not only provide transport to light infantry, but also carry additional ammo, water, and other equipment/supplies.

- Armor is very vulnerable in a MOUT environment, and needs light infantry to protect it from AT weapons, as seen in the Russians' fight in Grozny.

- Depending on the rules of engagement, the additional direct firepower of armor is very welcome to the light infantry unit.

This training was a win-win situation for both 1-33 Armor, and 1-5 IN (Light). Subject matter experts (SME) were present during the train-up and the JRTC rotation, and wrote a Center for Army Lessons Learned (CALL) newsletter article entitled "Fighting Light/Heavy in a Restricted Terrain: Tactics, Techniques, and Procedures," published in April '98 (No. 98-10). This newsletter is a in-depth look at light/heavy operations with numerous TTPs for both offensive and defensive operations.

JONATHAN W. FOX
CPT, IN

Adopting the ACAV Concept To Operations in the Balkans

Dear Sir:

As you know, the modifications to the M113 which later came to be called the "ACAV" were first made by the Vietnamese, using whatever materials they could beg, borrow, or steal. When I came on the scene, I got the

Saigon Ordnance Depot to develop the gun shield and hatch armor shown in the picture accompanying your article. That was called the "A-kit."

There was also a "B-kit," which added smaller gun shields to side-firing light machine guns mounted on both sides of the cargo hatch. Our people in Bosnia (and perhaps elsewhere) might be interested.

RAY BATTREALL
COL, U.S. Army (Ret.)

Cavalry Lineage Goes Back Further Than Author Stated

Dear Sir:

I apologize for being behind in my reading, but I just finished the May-June 1998 *ARMOR* and I think LTC Kris Thompson misread one of his sources.

He states, noting Urwin's *United States Cavalry*, that the United States government authorized two "cavalry" regiments in 1855. While this is technically correct — the regiments were designated 1st and 2nd Cavalry — these are not the first mounted regiments in United States service.

I understand LTC Thompson not going into the Revolution; but he overlooked the fact that the 1st and 2nd Regiments of Dragoons and the Regiment of Mounted Riflemen were in existence well before 1855. I once served in the 3d ACR ("Brave Rifles") and know that the Regiment of Mounted Riflemen was authorized in 1846. I don't have the dates for the two dragoon regiments handy, but I know they precede the Regiment of Mounted Riflemen. All three mounted regiments fought in the Mexican war (1848-49).

In 1861, all five mounted regiments were redesignated. The 1st and 2nd Regiments of Dragoons became the 1st and 2nd Cavalry Regiments. The Regiment of Mounted Riflemen became the 3rd Cavalry. The formerly designated 1st and 2nd Cavalry Regiments became the 4th and 5th Cavalry Regiments. The (new) 6th Cavalry Regiment was raised at about the same time.

This is not to knock LTC Thompson. I like the way he is going with his survey.

PETER L. BUNCE
SFC, USA, Ret'd

Winning the 21st Century Battle for Reconnaissance

Dear Sir:

The first "sensor" to sweep across the future battlefields of Gettysburg were the prowling eyes of Buford's cavalry. Today, future battlefields are spied out by Cav scouts using forward-looking infrared (FLIR) and image intensifier devices to create the sensor swept-battlefield.

If you can be seen, you can be hit.

If you can be hit, you can be killed.

This is the first reality of the 21st Century battlefield.

However, CPT Alexander's mountain bikes (July-Aug '98 *ARMOR*, p. 15) deploying from wheeled LAVs were not exercised against an opponent that can see like our enemies can with commonly available FLIR/NODs, though his mission descriptions were excellent primers for future bike Cav scouts. When his LAVs overwatched his bike scouts with FLIR, an ENEMY WITH FLIR COULD ALSO SEE HIS BIKE SCOUTS... calling down indirect fire on them or wait until they cycled back to their extremely thin-skinned LAVs and called indirect fire to destroy them all.

We at the 1st Tactical Studies Group (Airborne) are 100% in favor of Human Powered Vehicles (HPVs) All/Extreme Terrain mountain Bikes and Carts (A/ETBs, ATACs) fully used by light and heavy Army units. Since 1990, we've developed and perfected bikes and carts for this purpose; evidenced by articles in U.S. Army *ARMOR*, *Infantry*, and other defense journals, but it's clear that CPT Alexander's *ad hoc* experiment with bikes and LAVs ignores the reality of the sensor-swept battlefield due to fundamental weaknesses inherent in the wheeled vehicles using civilian, narrow tire bikes and thinly armored wheeled LAVs.

Alexander's bike scouts were not VISUAL and FLIR camouflaged to evade enemy protection although they were deployed far enough away that their LAV's engine did not give them away. This is a start, but if a friendly LAV can see his scout with FLIR, so can his FLIR-equipped enemy in a BMP-3, T-72 or Leopard 2. Scouts must wear "Thellie" camouflage suits (Teledyne Brown Engineering, Huntsville, AL) that render them invisible to FLIR and "ghillie" them up visually like a sniper. In 1995, we proved in field tests that ghillie strips (strips of cut burlap) can be attached to mountain bikes to break up their outline without interfering with their functions. A good sling like Ed Verdugo's Snap Sling (GRSC POB 1246, Yucaipa, CA 92399; 909-446-0272) enables carrying the long M16A2 assault rifle across your shoulder and cycle without it getting in the way. These steps make the bike Cav scouts invisible to the enemy but visible to the friendly scout vehicle by using a piece of No Power Thermal Tape (NPTT Night Vision Equipment Company, POB 266, Emmaus, PA 18049-0266; 610-391-9101) to signal back that the scout team is O.K. Area reconned can be marked by Battlefield Reference Marker System (BRMS Type A: NSN 6910-01-388-7699, EZ Info Inc., 801 Atchison St., Atchison, KS 66002; 800-676-1582; <http://users.microworld.net/~ezinfo>) panels visible to the Cav scout vehicle through its FLIR.

Unmilitarized bikes are unable to ride in sand, take up too much space and have to be stored outside, can get flat tires and are a handicap in close terrain. We fixed this by using FOLDING all-terrain bikes that can be

carried INSIDE the scout vehicle or with only a small part outside. A special case was developed to airdrop the folded ATBs for light/airborne units to use for recon/security issues. ATBs were jump tested in 1992 by Chuck Gilbert and myself in 1993 using the airdrop bag to lower my folded ATB prior to landing for quick recovery. The rest of the Army team (SSG Ernest Hoppe, SF; CPT Jeff Schram, AR) separately dropped from the same turbo-prop aircraft, linked up with me on the ground, then infiltrated to Fort Bragg, N.C., 30 miles away in less than an afternoon's time. Later tests, with 1LT David Tran and SGT Paul Latham (IN), proved visual and FLIR camouflage techniques and movement techniques. <http://www.geocities.com/Pentagon/5265/atb.htm>

Our bikes don't have inner tubes. A solid foam inner is used that cannot go flat regardless of how many nails, bullet holes, broken glass, rocks slam into the tire. (No More Flats; Cyclo Manufacturing, 1438 S. Cherokee St., Denver, CO 80223) If the terrain is too rugged to cycle, the ATB's rear rack makes it a cart for heavy items like the AN/PRC-119 SINC-GARS radio/ALICE rucks. In loose sandy desert terrain, extreme terrain bikes (ETBs) can be used that have 10-inch wide tires, making bike Cav Scouts fully invisible and mobile on the 21st century battlefield, not just areas where soil is firm enough to accept narrow civilian bike tires.

The U.S. LAV is a seriously flawed vehicle in terms of survivability. Its armor can only stop "garden variety" AKMs and there is a huge fuel tank inside ready to be exploded. If the wheeled LAV is detected, it's easy to disable and destroy it by enemy direct/indirect fire. Like the bike tires, its tires are filled with air when it should have a solid foam core. "Run flats" only allow it to limp home, not finish the mission.

The Canadian Army LAVs and our M113A3s have external fuel tanks. Regardless, wheeled LAVs cannot advance against enemy fire like a tracked M113A3 LAV can. The U.S. Army can save its money "reinventing the wheel(ed)" LAV using the tracked M113A3 LAV it already has, as pointed out regularly by armor futurists like Stan Crist.

Army Cav scout troops with M113A3s could airdrop force-entry into the named area of interest (NAI) and begin operations immediately, whereas a surface-landed wheeled LAV cav troop would have to wait for a beach or an airfield to be secured. The U.S. Army has the institutional heavy airdrop and rigger expertise/supplies proven with the decades of routine 3/73d Armor Battalion's M551 Sheridan airdrop in peace and in war to ensure our "Buford's Cavalry" gets to Little Round Top first. "Getting there fustest with the mostest" is critical to having our sensors sweep the battlefield first. With applique armor (protects all the way up to auto-cannon and RPGs), external fuel tanks, spall liners, the M113A3 is not easily damaged by enemy counterreconnaissance. Its tracks will not go flat as they can rumble over glass, debris without damage. A/ETB scouts deploying from the M113A3 by being invisible to the enemy themselves will

not compromise their motor driven vehicle. M113A3 engines can be silenced like the German Army's and a space blanket mylar tarp thrown over it, FLIR camouflaged from detection in its hull down, hide/overwatched position. Vehicle and its scouts are now "stealthy" and invisible to the enemy detection, yet we can see the enemy first. The side that sees the enemy first WINS the war.

The M113A3/A/ETB Cav scout troop does not have to restrict itself to just passive recon or direct fire engagements, M113A3s have plenty of space to carry Javelin "fire and forget," signatureless ATGMs to ambush and destroy enemies forces at little risk to themselves. Javelins can be fired on foot, from the top troop hatch of the M113A3, or from forward ambush position cycled to by the A/ETBs.

U.S. Army 25th Bicycle Corps troops put down riots in Cuba and charted the west with early bikes. Yamashita used bikes to defeat the British by massive jungle infiltrations into rear areas to seize Malaya/Singapore in 1942.

British Commandos jumped folding bikes to seize the Bruneval radar station in WWII. Their Gurkhas, 5th Airborne Brigade, and S.A.S. use them today. The militarized mountain bike has almost unlimited potential as "stealthy" platforms if fully exploited. The light tracked LAV to carry bike Cav Scouts comes from our terrain agile Vietnam past, the M113A3 (1990s incarnation): the ideal, no-cost platform for a global U.S. Cavalry force in the 2d ACR to meet the world-wide demands of the U.S. Army XVIII Airborne Corps.

Mike Sparks
1st TSG (A)

A Call for Papers

Dear Sir:

The Council on America's Military Past, a non-profit organization, has changed the name of its publication, *Periodical*, to *The Journal of America's Military Past*.

We have recently changed our title and our editorial policy. We are looking for articles about historical military posts (to include battlefields, ships, and airplanes), as well as biographical and autobiographical pieces about servicemen or servicewomen who, ideally, served on a historical post.

If you have written an original article about these topics, the editors of the Journal would like to hear from you. COL Nicholas Reynolds, USMCR, the editor, can be reached at P.O. Box 3087, Laredo, TX 78044 until 1 August, when his address will be 502 North Norwood St., Arlington, VA 22203. COL Reynolds is also on email at NRREY@compuserve.com. Associate Editor Mark Bradley is at 3607 N. 22nd St., Arlington, VA 22207, or at email munbrad@erols.com

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One Team, One Fight, One Future

"United we stand, divided we fall." This simple phrase, nearly trite, nevertheless represents the imperative of the "team of teams" approach to the future that we as an Army, and the Armor and Cavalry Force in particular, must pursue or risk certain failure in nearly everything we do. It has long been obvious to me that teamwork is an essential element of success. Some time ago, it became one of the three pillars of my philosophy of command. We may be tempted to indulge in "hand-wringing" over not having enough resources, but one positive outcome of budget constraints has been that working as a team, at every level, has proven to be a superb efficiency and a strategy for "doing the best we can with less." I think it appropriate, therefore, that in my final commentary as the Chief of Armor I focus on how very critical this notion of teamwork is to our future.

In the post-Cold War era, wars and conflicts in which the United States involves itself have been and likely will continue to be fought by coalitions of nations. Building consensus among allies or coalition partners has become a virtual requirement before the nation will commit the military to any endeavor. The vagaries of modern defense industries and the need to develop compatible systems in an era of rapid modernization have also driven international defense team-building. The Future Scout and Cavalry System is a prime example. The FSCS is an extremely promising project that will meet a

critical combat need for the Army. Two consortia of both U.S. and U.K. companies are working this project. At the strategic level, therefore, team building has become an imperative.

The tailored packages of forces that we either forward station or deploy are never single service. Joint warfare, more than ever, is the rule. The old notions of service parochialism and proponent stove-piping are facing a certain death in light of the realities of modern warfare. These realities have dictated symbiotic relationships in which every service has had to

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emphasize a capability meant to enhance the other. To deploy ground forces, for example, the Navy has had to prioritize fielding of fast surface ships and is dedicating ships to pre-positioned equipment afloat. The Air Force plans to build many more C17 aircraft. Joint doctrine, joint war-gaming, and plain old "joint-thinking" have all supplanted the parochial schools of thought. The Department of Defense is more a team of cooperative services than at any time in its history.

The Armor Force has been a TRADOC leader in forging the combined arms team across the Army. TRADOC has specifically chartered the Armor Center to be the integrator for the entire mounted combined arms team. This mission has necessitated close cooperation with the Infantry, Engineer, and Field Artillery Centers as well as with the Combined Arms Support Command (CASCOM). Major General Ernst, Commander of the Infantry Center, and I agree that the relationship of the two combat maneuver arms has never been so healthy. I hope this remains an enduring legacy. There is now an inborn realization that no two arms can go it alone.

The psychological and real shock effect that heavy forces on the ground provide is increasingly appreciated. Force planners and those who tailor packages for deployments routinely conduct the METT-T analysis unique to a given situation in determining the mix of forces required. The cooperative effort of the Infantry and Armor schools in doctrine and force developments has never been greater. The ongoing work in reviewing and developing the mutual roles of armor and infantry in urban warfare is one such example. We have had to closely integrate our efforts along the heavy and light axis of the Army Experimental Campaign Plan.

CASCOM has evolved the professional development of its leaders to better equip them to support the maneuver arms. One indicator of this is that there are now

more service support officers in the Armor Captain's Career Course (AC3) and I am gaining acceptance of the idea that all forward support company commanders of the evolving Force XXI CSS design should attend AC3. The cooperative work on this design is itself an indicator of forward-looking combined arms thinking. The notion of combined arms, a philosophy long extolled but more rarely practiced, is another team effort with substance and we, the Armored Force, are leading the way.

"One team-one fight-one future." This motto clearly states the imperative for integrating Active and Reserve Components and for the AC/RC teaming initiatives taking place in our Army today. Over half of the Armored Force is in the Army National Guard. The active armored force structure now contains fewer tank battalions than were required to fight during Desert Storm. However, the ability to fight one such major regional conflict and respond to a second peacekeeping operation is the minimal requirement of our national military strategy. The conclusion is obvious: our national security strategy cannot possibly be met without planning for employing Army National Guard Armor forces. This reality is helping to speed the dissolution of long held parochial interests and prejudices which the Army can no longer afford to hold.

Burgeoning AC/RC integration is a clear indicator of how the Total Armor Force has transitioned from concept to reality. There is a great demand for AC Armor officers to fill AC/RC billets. An Active Army LTC recently completed his initial year in the first ever AC command of an ARNG cavalry squadron and there are future plans for National Guardsmen to take command of AC tank battalions. Enhanced Separate Brigades (ESBs) of the ARNG are now linked under AC Division HQs. Enhanced brigades from North and South Carolina and Georgia have been stood up under the 24th Infantry Division (M), headquartered at Fort Riley with a forward HQ at Fort Jackson. The same arrangement has applied to the stand up of the 7th Infantry Division (L) with light ARNG brigades from Oregon, Oklahoma, and Arkansas. The AC Division HQs will exercise Training Readiness Oversight of the ARNG ESBs starting in FY 00, to include METL approval, issuance of training guidance, and approval of training plans.

Divisional teaming between AC and RC units is another aspect of the "one team-one fight-one future" philosophy of the

Total Army. Mutual support between AC and RC divisions promises to improve METL proficiency for reserve component units and to relieve the burden of prolonged deployment on the active component. The 40th Infantry Division (CA ARNG) has integrated its soldiers into the 4th Infantry Division for NTC rotations and has also provided OC augmentation. The 49th Armored Division headquarters (TXARNG) is preparing to assume the Bosnia SFOR mission next year. 3rd ACR will be subordinate to the 49th AD for this mission. The teaming relationship between the 49th and the 1st Cavalry Division, the current SFOR, has given the 49th AD a great advantage in preparing for next year's transition. The two teamed divisions have shared TADSS to support aspects of the current deployment. This TADSS sharing has resulted in over half a million dollars cost savings. Just two months ago, the Army announced the teaming of the 10th Mountain and 29th (VA ARNG) Infantry Divisions and the 3rd and 28th (PA ARNG) Mechanized Infantry Divisions. The Army is, and has to be, clearly committed to this approach.

The Armor Center and School has also witnessed a significant increase in its already robust RC support mission. This year we expect to train nearly 60,000 USAR/ARNG soldiers from 22 states. The RC's demand to participate in our virtual training program has grown every year since its inception five years ago, and now exceeds our planned capacity. One of the ARNG's 15 enhanced brigades and its only Cavalry Regiment, the 278th ACR (TENN ARNG), relocated its MATES to Fort Knox this year and is currently conducting its AT here as well.

ARNG officers have been the greatest beneficiaries of the Fort Knox Army lead in distance learning initiatives. The asynchronous phase of AC3-DL has been ongoing since last December. It has allowed ARNG officers to receive the same quality instruction as AC officers but with the convenience and cost savings of doing it from their home PCs. A key component of the "One Team" Mounted Training Strategy we are developing in cooperation across TRADOC is inclusion of the ARNG with special attention to its unique requirements and capabilities.

More evidence of increasing teamwork in support of the nation's defense can be found in the military's growing partnerships with civilian communities and the defense industry. The vertical and lateral cooperation between industry and the force has increased greatly due in large

part to acquisition reforms and the ability to accelerate production cycles on proven technologies or off-the-shelf technologies. The concept of teamwork, however, must extend to the lateral relations within industry itself. Industry is discovering that cooperation with "competitors" can often be a "win-win" situation. Mutual benefit has also been the attraction for cooperation between the military and civilian communities as well. For example, the distance learning initiatives of the Armor School have involved significant joint effort with major academic institutions to include the University of Louisville, the University of Kentucky, Western Kentucky University, and UCLA. The training advantages of working with the civilian community extend to the training support base in terms of privatization, commercialization, and sharing of resources, all of which Fort Knox and other installations pursue as part of this decade's Defense Reform Initiatives.

Here at the Armor Center we are the experts in providing institutional support; it is our main reason for being. We facilitate the teamwork of which I have written. I encourage you to use the Armor Center Points of Contact, whose phone numbers and e-mail addresses appear on Page 2 of every *ARMOR* Magazine, for whatever assistance and information requirements you may have. Moreover, I ask that you become a frequent visitor to the Armor Center Home Page at <http://147.238.100.101/>. Armor field grade officers are also invited to subscribe to the ARMORNET, which is a moderated net listing designed to be an open forum for discussing a broad range of issues pertinent to the Force. You may apply for subscription by using the designated link found on the Home Page.

The broad, varied, and enduring team efforts I have spoken of are in no way meant to describe the relations of faceless entities and organizational wiring diagrams. People are the engine that drive every aspect of the advance towards "one team-one fight-one future." Teamwork is inherently a dimension of human relations requiring the sincere commitment of soldiers, sergeants, officers, and civilians to make it work. We are, have been, and always will be in the people business. The power of America, its military, and the Armored Force continues to depend on the quality of our soldiers and our ability to consistently integrate technology and concepts into the battlefield in a coherent manner through training.

Forge the Thunderbolt!

DRIVER'S SEAT

New Professional Development Guide: How to Succeed in the Armor Force

by CSM David L. Lady, Command Sergeant Major, U.S. Army Armor Center

I presented all armor sergeants major attending the 1999 Armor Conference with their own copy of our newly finished professional development guide. Nearly a year in the making, this guide provides career planning and professional development guidance for Armor and cavalry soldiers and noncommissioned officers. It is a summary of what a tanker or scout must do, and when they must do it, in order to prepare for additional responsibility and promotion. From PVT to CSM, it describes how to succeed in the Armor Force.

In 51 pages, the guide reviews the role of soldiers, leaders, and personnel managers in the Enlisted Personnel Management System; explains professional development requirements for each rank; summarizes the noncommissioned officer evaluation reporting system. It explains how to prepare for DA centralized selection boards (SFC, MSG, SGM/CSM). The guide also contains the structure of the armored force, lists all active component armor and cavalry regimental designations, and provides enlisted personnel management directorate-communications initiatives with useful internet addresses.

"MOS certification" is the heart of the guide. Stated bluntly, the armor and cavalry force needs expert warfighting leaders. It must select those tankers and scouts with the most success and experience as leaders of warfighting teams for promotion and additional responsibility. Certification requires that all enlisted soldiers prove themselves experts in the key leadership assignments for their grade before they will be identified as ready for promotion. Armor assignment branch managers use this concept as they advise soldiers which assignments are best for their professional development. Branch must allow soldiers to remain in these leadership assignments for at least 18 months. I admit that this is barely enough time for the NCO to be identified as "ready for promotion" (through the NCOER), but is often the best that our

assignment managers can allow before reassigning soldiers into higher priority specialty assignments.

Our best soldiers will probably serve in specialty or staff assignments at **each** NCO grade, not at every other grade. The days of tank commanders and platoon sergeants with multiple consecutive assignments in line platoons are over. Armor force structure requires that over half of our staff sergeants and sergeants first class go to the personnel priority group (PPG1) specialty assignments as soon as they achieve minimum certification requirements. This is the harsh reality, due to an increasing imbalance in cavalry and armor between TOE and TDA authorizations. This situation is not the fault of certification requirements, rather the opposite is true. Many of these PPG1 assignments require experienced tank commanders, scout section leaders, and platoon sergeants (such as AC/RC, observer-controller, and instructor) in order to satisfy eligibility requirements.

Certification places a structure on the assignment process, places needed emphasis on warfighting skills and experience as soldiers develop themselves, and allows armor and cavalry to fill the PPG1 assignments with NCOs qualified for those missions.

The professional development guide also identifies the balance that every soldier must achieve between certifying and specialty assignments, at each NCO grade. Both types of assignments are necessary to develop the NCO, and a typical pattern of assignments should be "line to specialty and back to line." Consecutive specialty or staff jobs, in different assignments, will hurt an NCO's chance for promotion. The guide also explains the role that military education, civilian education, and physical fitness play in professional development.

Interspersed among the guidelines for each enlisted rank are comments from the last three centralized selection boards.

These comments from the panel members illustrate what identified NCOs as ready or not ready for promotion. They are very interesting and should add credibility to the guidelines.

Thirteen pages of the guide focus on the NCOER and preparation for centralized boards. The guide explains the importance of accurate records, the personnel qualification record (PQR), and the photograph, and reviews when and how to write a letter to the president of the board. How to request microfiche and how to transfer Articles 15 from performance fiche are also explained. Finally, it tells when and how to request a re-look of your records by the Standby Advisory Board, if you believe that your records were incomplete or incorrect when reviewed by the selection board.

This guide was ably written by SFC Michael Carew, a cavalry scout, who took it through numerous drafts to meet the intent of the Chief of Armor and me. His research and writing abilities have benefited our entire force.

It is available to every interested soldier. The whole text or any portion of the text may be reproduced. Copies of this text are available from the Office of the Chief of Armor (OCA), ATZK-AR, Fort Knox, Kentucky, 40121-5000, DSN 464-1439/1368, and from the OCA home page at:

<http://147.238.100.101/center/oca>

Every leader should read this guide and use it to coach his soldiers. It is consistent with the guidance that I have given the last five selection boards. I WILL USE IT AS I GUIDE FUTURE SELECTION BOARDS. Leaders, assignment managers, and soldiers themselves can all contribute to effective development of a well-trained and mature noncommissioned force by using our armor enlisted professional development guide.

"SERGEANT, TAKE THE LEAD"

American Armor in Albania, A Soldier's Mosaic

by Lieutenant Colonel Peter W. Rose II

As this issue was going to press, there were reports that TF Hawk would redeploy to Macedonia to support a settlement in Kosovo. — Ed.

Rinas Airfield, Tirana, Albania — Go anywhere in the world the U.S. Army has troops and you are likely to find specially tailored task forces at work. That is no surprise to a soldier of a globally projected Army. Armor and Cavalry units in the Balkans? Nothing new there. The Bosnia mission is a familiar one, so is duty in Macedonia. So what's new?

Well, there's American armor in Albania.

This is going to be a good news story, because what is happening here is good news. I chose to write to let you know there are thousands of success stories daily — soldiers, NCOs and officers making it happen. Sometimes the situation hasn't been perfect, but what is important is how soldiers and their leadership tackled challenges and continue to do so.

I arrived in time to deal with the last of the mud. I worked with others to make the mud go away before wooden tent floors arrived. I filled and humped a soldier's share of sandbags too. Dwell on that and you will miss what has really happened and continues to unfold. There have been thousands of small victories, and there will be thousands more.

If you want to know about the handful of mishaps, most well beyond the control of the leadership here, go and read the recent column by COL (Retired) David Hackworth, who printed apparently verbatim the gripes of a disgruntled soldier here. You will read about being deployed to a mud hole, confusion upon landing, being detoured around the command group to get to the latrine, and other gripes meant to suggest leadership was broken here. The column portrays, amplifies, and distorts the very rare "exception." I'll give you the rule, and I'll use the words of as many soldiers as I can.



Charlie 33 pulls security along the berm at the east side of the TF Hawk perimeter. C Company, 1-35 Armor, is part of TF 1-6 IN at the airport base near Tirana, Albania.

I'll do my best to represent the troops I know best and love — soldiers forged with the thunderbolt. I have done my best to piece together a mosaic of feelings, ideas and observations that belong to our soldiers and express what its like to be here in Albania.

Since I'm on a solid soapbox, I hope this article finds it way to you, Colonel (Retired) Hackworth. Many here are disappointed that your article published the complaints of a whiner. All you have to do is come to see what has been done to take care of soldiers. We would all like the PX to be operational, and all the tents to have floors before the first soldier arrives, but it doesn't work that way. Sir, you should have checked it out.

I want the leader who is ultimately responsible for every American life here to have the clearest head possible, and if a couple of pieces of plywood help give him fifteen minutes more quiet time to make decisions, then send him everything Georgia-Pacific can clear cut. Okay, that is off my chest; now let's talk about what has been going on here, in Albania.

I deployed here this spring with a Training and Doctrine Command Lessons Learned Team. Here, in the southeastern corner of the Balkans, I found a rather unique Army task force, Task Force Hawk, which stood poised and ready to strike, secure, or support as the Supreme Allied Commander Europe required. The

task force was built around Apache helicopters and Multiple Launch Rocket Systems (MLRS) artillery. I moved around the task force assembly area, Camp Reichert, and saw forces that might surprise. Tankers and scouts, part of a "heavy" task force, serving as an integral part of Task Force Hawk's force protection team. This "cold war anachronism" gave the task force commander the ability to conduct limited offensive or defensive operations at a time when the situation was not very clear.

The tanks and crews I saw belonged to Company C, 1st Battalion, 35th Armor, "Conquerors." The company's parent unit for this operation was Task Force 1-6 (TF 1-6), an infantry-heavy task force that included the headquarters and headquarters company and two mechanized infantry companies of 1st Battalion, Sixth Infantry, a rifle company from the 2d Battalion, 505th Parachute Infantry Regiment, and "Charlie Tank." TF 1-6 was further augmented by the scout platoon of 1-35 Armor.

Charlie Company's commander, Captain Steve Lutsky, deployed from Baumholder, Germany, explained that there were several facets to the infantry battalion task force mission that also fell within the capabilities and mission of a combined arms team. April and May found the task force focused on force protection. The tank company was task-organized into a tank-heavy company team, swap-



Above, even after weeks of dry weather, there is some mud parking still available.

At left, the TF HAWK Welcome Center, where each new soldier assigned passes through for a briefing prior to linking up with his unit.

ping out one of its tank platoons for a mechanized infantry platoon. CPT Lutsky said his company team was here to provide an armor punch to any and all operations. “We can secure, surveil, defend, attack, and move to block, ensuring uninterrupted operations by Task Force Hawk units operating in and around the Tirana — Rinas Airfield.” Naysayers might accuse CPT Lutsky of being overly biased towards the employment of armor. Nope, that wasn’t the case. The factors of METT-TC (mission, enemy, troops, terrain – time and civil) were different here, but the principles of employing armor had significant utility. Summing up comments by the battalion task force commander, LTC Jim Embrey, Charlie Company was an essential part of his team.

CPT Lutsky said his fourteen tanks, their command and control and support had deployed by C-17 Globemasters. “We were given three weeks notice. We used two weeks to prepare and move to Ramstein Air Force Base, and deployed a week later.”

Deploying by C-17 was just one more first for the 35th Armor Regiment. U.S. Army Europe units are used to deploying by rail and sea. Air deployment was not a mission essential task for many heavy units stationed in Germany. Charlie Company didn’t accomplish this feat alone: there was great support from the parent battalion, which also deployed its scout platoon to Albania.

I was eager to hear what the troops would have to say, and wondered what had made the strongest impressions on them. Many readers will probably remember reading about the conditions Task Force Hawk found itself in during the early days. Rain and mud were not

shortage commodities for this military enclave north of Tirana, and I expected that to be the strongest impression, but I was only partly correct.

Sergeant First Class Randall Sumner, a Tennessean who serves as platoon sergeant for 3d Platoon, explained how the company team was able to remain agile. It was in great part due to the unit’s preparation, he said: “Company training included mission-oriented classes covering defense, observation posts, tactical road marches and movement, hand and arm signals, occupation of hasty and deliberate positions, sketch cards, quartering parties, assembly area procedures.” The list went on to include individual and crew duties, boresighting, prep-to-fire checks, and crew level (tank) maintenance.

SFC Sumner credited the unit’s preparatory training at home station, including force protection, taking and securing prisoners, base camp operations, media awareness, and time on the UCOFT (Unit Conduct of Fire Trainers). The company showed its Bosnia experience through buddy equipment checks, weapons security and good field hygiene. SFC Sumner shared his platoon’s excitement. There was even a good chance his platoon would get a chance to shoot, maybe sooner than later. Task Force Hawk had developed plans to build and operate live-fire ranges for tank gunnery and small arms marksmanship. The company goal was to shoot tank tables four to eight, or at least modified tables five and six.

SSG John Demey said he would always remember setting up the perimeter security, the process of building and occupying towers, establishing, coordinating and recording fields of observation and fire. There was a great deal of work involved

in getting the berms built, commo working, and building vehicle fighting positions. What else? “The mud, he grinned.” His platoon hadn’t gotten a tank stuck, he said, but a soldier had sunk past knee-deep, requiring three of his buddies to extract him.

Specialist Anthony Housey, a tank driver, said “tank wise,” the units were somewhat limited in where the tanks could go in and around the assembly area and airfield. When not on the perimeter with their tanks, these armor crewmen could have been mistaken for military police, engineers, or even infantry. Multi-functional soldiers were in high demand and SPC Housey would proudly remember how his company answered the call.

This was a first deployment for Specialist Jeremy Freeman, a tank loader. I wondered how the comments from a soldier unbiased by other deployments might differ. First, his loader’s machine gun could be his weapon of choice over a loaded 120mm tank cannon. SPC Freeman was also adapting to a different set of employment factors. Five hundred meters was a pretty long distance in some cases. Finally — and it was coming out again — tankers made pretty darn good dismounts when more “crunchies” were needed.

Freeman was appreciative of the creature comforts that were materializing. The Army and Air Force Exchange Service had brought in several semi-trailers set up as mobile “shopettes.” His company, when not pulling perimeter security had showers less than two hundred meters away. Chow was good. These were all “morale multipliers.”

Continued on Page 50

For the Range NCOIC, A Skidgel Hall Curriculum Is Not a Requirement

by Sergeant First Class Myron F. Wong

With evening LOGPAC, prep to fire checks, and boresighting complete, you and your crew make your way to the location of the evening range safety briefing. On the way to the safety briefing, you find yourself mentally reviewing topics covered at the Tank Crew Evaluator (TCE) After Action Review (AAR) that followed your grueling Tank Table VII day run earlier in the day.

Finally, everybody assembles at the designated briefing location, which overlooks the range course roads. The Range Safety Officer (RSO) begins his safety briefing. During the briefing, the RSO mentions that there is a potential risk of tank crews getting disoriented during the night run and inadvertently traveling deep into the impact area. To mitigate this risk, the RSO mentions that the course route, battle positions, and firing points are marked by chem-lights.

Upon hearing this bit of comforting news, you and several of your tankers brethren glance out across the range only to discover that no chem-lights are lit. Worse, only 15 minutes remain before the range control mandated cease-fire time is over. You realize it requires special clearance from range control to go down range to mark the route with chem-lights after the mandatory cease-fire time is up, which will negatively impact the hot status of neighboring ranges.

Unable to contain himself any longer, a fellow tanker interrupts the briefing. "Excuse me, sergeant, but I don't see any chem-lights out there." A little angered at the interruption, the RSO squelches the growing mumbling amongst the firing crews with a short burst of "Look, when I'm finished with my briefing, I'll take it up with the Mike Golf [master gunner]."

Sound familiar? I submit that tankers have experienced this and other range-



related snafus a few more times than we care to admit. I further submit that, accompanying nearly all of these snafus, there is a tanker who chimes in with "I'm not the Mike Golf. He's Sergeant So-and-So."

Regardless of how competent and proficient a master gunner might be, he is only one person. As such, he should not be responsible for everything on the range. Two distinct NCOs must work together to run a tank or Bradley gunnery range, the range NCOIC and the company master gunner. Their responsibilities should complement each other and result in a tank table that is easier to plan, execute, and, probably most importantly, to adjust during execution. This article will explore the duties, responsibilities, and requirements of a range NCOIC, a position that does not require a Skidgel Hall curriculum.

The company/battalion master gunner mainly concentrates on all aspects of gunnery training on the range: scenario planning, targetry and firing locations, TCE training and monitoring, firing system problems, identifying crew trends or problem areas, re-runs, and so on. Basically, he is free to implement the training he received at the Master Gunner Course.

The range NCOIC takes care of nearly all other range requirements and functions needed on a tank range — all those administrative obligations that allow execution of the range. He does not have to be a school-trained master gunner, but he should be familiar with such things as troop leading procedures, problem-solving techniques, backwards planning, and pre-execution checks. It is important that the range NCOIC has a proactive frame of mind about his role: together with the company master gunner, *he owns the range.*

The range NCOIC is not only responsible for the execution, but for all relevant events prior to his range, as well as battle hand-over of his range to another unit or tear-down once his company is through. Examples of these requirements include things like drawing and testing cassette tapes and tape players, emplacing and testing communication equipment, pre-stocking any needed chem-lights, deconflicting ammunition drops and residue pick-ups, outside support of medical personnel and vehicles, heavy equipment transport times, interacting with range control, and so on.

Though the range NCOIC may delegate tasks, he is the coordinator, point of con-

tact, and enforcer of everything affecting the operation of his range.

The range NCOIC and company/battalion master gunner must act as a team, conferring with each other during the planning, execution, and recovery from a particular range. This division of labor safeguards any one individual from being overcome by all the things that must occur before, during, and after a tank company/battalion is on a range. For example, if a company/battalion master gunner is trying to troubleshoot a problem found during the screening of a tank and crew, he should not have to worry about a range guard not being present for duty. Likewise, a range NCOIC doesn't need to be a Master Gunner Course graduate to ensure that chem-lights are on hand for the night portion of his range, or to plan for the positioning of those chem-lights during the evening mandatory cease-fire time.

The range NCOIC must not merely rest on his laurels because things are specified in the battalion gunnery order. For example, the battalion gunnery order may specify that the S3 will coordinate for delivery of ammunition on the NCOIC's range. In this example, after reviewing the battalion gunnery order, the range NCOIC coordinates with the support platoon sergeant to identify himself as the man in charge of the range where the ammunition will be delivered, confirm the delivery date and time, identify initially where the ammunition will be delivered on the range, who will meet the cargo truck when it arrives, confirm the residue pick-up date and time, and coordinate with the unit or element tasked with a guard force. Additionally, following the idea of pre-execution checks, if changes are made to the original schedule and coordination, regardless of who in the battalion made the change, that range NCOIC will re-confirm/coordinate those changes, because those changes have an impact on his range.

Prior to the execution of a tank range, the range NCOIC should conduct a battalion range briefing. Attendees at this briefing should include the battalion commander, the S3, the battalion command sergeant major, the operations sergeant major, and the battalion master gunner. Additionally, each company commander, company 1SG, and company master gunner should attend. Fi-



nally, from HHC or the Forward Support Company, the support platoon leader and sergeant, medic platoon leader and sergeant, scout platoon leader and sergeant, mortar platoon leader and sergeant, and the maintenance officer/technician/NCO should attend this briefing. Others may attend if they wish. During this briefing, the range NCOIC will brief all aspects of his range using a briefing board (butcher board) as a visual aid, and a briefing book. The range NCOIC will give the briefing book to the members of the head table to review while he is conducting his range brief. The briefing board will mirror very closely the briefing book. Emphasis for these briefing aids will be on content and functionality, rather than on

While "cheese" goes a long way towards fostering unit pride, displaying one's "doctoral degree in PowerPoint" does not replace considerations such as identifying the need and number of tape players, cassette tapes, the power source for those tape players, and the PMCS of the items.

what people may term as "excessive cheese." While "cheese" goes a long way towards fostering unit pride, displaying one's "doctoral degree in PowerPoint" does not replace considerations such as identifying the need and number of tape players, cassette tapes, the power source for those tape players, and the PMCS of the items. This range briefing will constitute the final command review of the range conduct and the training slated for that range. The range NCOIC focuses on the range conduct and the master gunner focuses on the training slated for that range. It does not replace any specified

IPRs or command-level range recons. Specific members of the audience will assist with or reinforce topics raised during the brief if required. The fact that the range NCOIC is giving the brief reinforces that he owns the range and is therefore responsible for the conduct of the range. Members of the head table may call for a subsequent briefing by the range NCOIC if the number and complexity of changes made during this briefing make it necessary. Upon completion of the briefing, the briefing board now becomes a visual aid for the range reporting NCO, and the briefing book becomes a reference for the range NCOIC. If this briefing book is thorough, the range NCOIC can be swapped out at the last minute. After reviewing this briefing book, the replacement will have an easier time continuing with the conduct of the tank range.

Briefing board contents will include the following:

- Key range personnel, support personnel, the rotation plan if listing subsequent names is not feasible, and names of soldiers and vehicle bumper numbers from slice element support, such as engineers and additional medic support. Examples of key personnel might include the OIC, the range NCOIC, the master gunner, and the RSO. Support personnel might include medics, maintenance teams, and the civilian range crew POC.
- Goals for the firing crews.
- Range layout, which includes not only the target and firing locations, but more importantly, course routes and return routes, marshaling areas, maintenance areas, AAR locations, TCE locations, medic locations, and so on. This is obviously going to require input from the master gunner. Remember that the range NCOIC and the master gunner are a team.
- Time lines prior to the range execution, during execution, and after the unit is done with the range, such as equipment cleaning and turn-in times, cleaning teams, and so on. Planning for the recovery from a tank gunnery range is just as

Tank and Bradley Gunnery Ranges

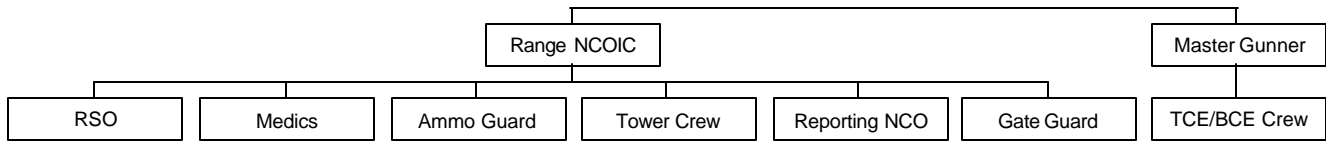


Figure 1.

This illustrates the relationship of range personnel for tank and Bradley gunnery ranges. This will work well at the company (sub-tables) and battalion (Table VIII, XI, and XII) level ranges. The maintenance team is not shown in this diagram. Though the maintenance team does not specifically work for either the range NCOIC or the master gunner, both of these NCOs interact with that team. The Range NCOIC declares where organizational maintenance activities can take place on the range after coordinating with the civilian range crew POC or Range Control. The master gunner works hand in hand with the maintenance team when troubleshooting serious maintenance problems, which may verify a possible alibi. The master gunner is now free to exercise all of the things he was taught at the Master Gunner Course.

important as all the things leading up to and including the execution of the range. As such, this should not be overlooked or taken lightly.

- Necessary equipment and coordinating information, such as tape players, range flag, TCE score sheets, and so on.
- Risk assessments and risk reduction measures relevant to that range and that unit.

The briefing book will mirror the contents of the briefing board page for page, but will include the following:

- Gate Guard Script. Some may think this is ridiculous. I submit to you that this soldier is the first to make contact with non-firing visitors that come onto a particular range. As such, how the gate guard carries himself will go a long way towards setting the tone for any visitor to a tank range. First impressions are hard to change. However, the range NCOIC must guard against turning this gate guard into some sort of pre-reporting NCO. Contents of the script should focus on what unit is on the range, what tank table is being fired, any safety considerations (for example, where to get ear plugs), who is the reporting NCO, and where to go on the range to meet the reporting NCO. If the gate guard can convey this

information in a confident and forceful manner, it will go a long way towards setting a positive tone for any potential visitors to a tank range.

- Copies of memorandums or hand receipts that apply to the necessary equipment and coordinating information, including key names and phone numbers.
- Miscellaneous items, which can include copies of range usage forms, range control hand receipts, training and support center (TSC) hand receipts, safety briefing script, chow requests, and so on.

A checklist of responsibilities for the range NCOIC and the company master gunner, as well as examples of a battalion range briefing book and briefing board should be created and remain on hand as a guide at the company and battalion S3 level. I further recommend that these tools be easy to slightly modify as necessary for different ranges. Or keep one briefing book and board on hand for each range. Still, the idea here is to work smarter, not harder.

With minor modifications, one can see how this concept can be adapted to small arms ranges. In that case, the principal NCO is the range NCOIC, and a supporting armorer replaces the master gunner.

In a normal tank company, excluding the first sergeant, there are at least nine NCOs. I wrote this article to identify one technique these high-speed NCOs can use to be proactive and take the initiative in helping the Mike Golf run the tank range — a technique that does not require these NCOs to be Skidgel Hall alumni.

I used *FM 25-101, Battle Focused Training* and *FM 17-12-1-1&2, Tank Gunnery* as references for this article.

SFC Myron F. Wong is currently platoon trainer on the Armor Task Force Observer-Controller Team (Cobras), NTC. His previous assignments include platoon sergeant, platoon leader, and assistant battalion operations NCO. He scored a perfect 1000-point Tank Table VIII on an M1A1, is a member of the USAREUR Sergeant Morales Club, received Superior and Distinguished ratings on M1A1 Tank Table XII, and qualified an M1A2 platoon on Tank Table VIII. He has run numerous tank tactical and gunnery tables and small arms ranges as the range NCOIC.

Small Arms Ranges

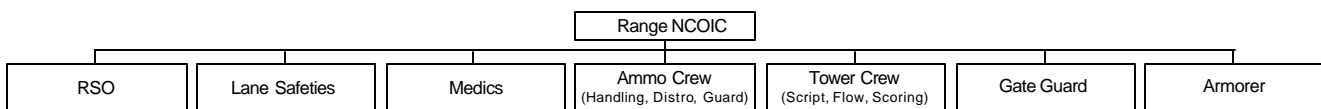


Figure 2.

This chart illustrates minor changes for use on small arms ranges. The master gunner is replaced by an armorer, who in turn works for the Range NCOIC. Lane safeties may be required, depending on the size of the range. The ammo crew now has the additional task of loading magazines for pistol and rifle ranges. With the elimination of TCEs and BCEs, scoring must be accomplished by other range personnel. One technique is to have part of the tower crew perform this task.



The Leopard 2A6 has a longer gun tube and new ammo.

Tank Assessment Survey Ranks Leopard 2A6 Tops, With M1A2 the Runner-up

Prepared by Jon Clemens, *ARMOR* Managing Editor

What's the best tank in the world?

A lot of U.S. tankers would disagree, but a consulting firm called Forecast International, asked to rate the world's tanks, argues that the most recent version of the German Leopard 2 edges out the M1A2 as world's best.

GERMAN LEOPARD 2A6

"This potent tank has been greatly improved in the latest operational version, the A5 (Improved), maintaining the lead that it has held for some time," the report concluded. It noted that the version of the Leopard 2 that was recently adopted by the Swedish Army after competitive trials is "even better than the A5 as used by Germany. This is due to the incorporation of a new, advanced command and control system and the Galix vehicle protection system. The Leopard 2S also features a new passive armor system."

The German Army's version of the Leopard 2 has also been upgraded with a longer gun tube and new ammunition. This version is called the Leopard 2A6.

The M1A2 was rated as having the best crew protection of the tanks rated. Its IVIS system also drew high marks for its communication capabilities.

Other features of the Leopard 2 series that drew high praise were the tank's MB 873 diesel engine, improved turret armor protection, and a new all-electric gun control and stabilization system that eliminates the danger of a hydraulic fluid fire and operates more quietly. New fire control components and some repackaging of the components within the turret have improved the "fightability" of the tanks, making the Leopard's "hunter-killer" target acquisition even more effective.

But the report noted that the Leopard 2's lead over the M1A2 had closed over the years and was now exceedingly small.

Much of the rating hung on the improved cannon.

U.S. M1A2 ABRAMS

The addition of the Commander's Independent Thermal Viewer, with its target hand-off capability, brought the Abrams to the same level as the Leopard 2 in terms of a "hunter-killer" target acquisition system. Unlike all other tanks, the newest Abrams also has the Inter-Vehicular Information System which, as the report notes, "Adds a significant capability that is lacking in most other tanks; in point of fact, with regard to the vital communications task, due to the



level of interconnectivity, the M1A2 beats out the Leopard 2 hands down.”

The Abrams’ passive protection (its armor) was rated the best in the world.

The Abrams led the world in adopting the gas turbine engine. One can argue its advantages and disadvantages, the report noted, but few nations are willing to adopt these engines because of their high fuel consumption versus diesels: “The performance of the engine on the M1 is not questioned; many nations feel that the associated support of the vehicular gas turbine-powered Abrams is just too much for them to afford.” On that point, an MTU diesel has been integrated into the M1 which is under consideration by the Turkish Army.

The system enhancements recently funded for the Abrams will improve fire control, command and control systems, and other electronics and “will keep this tank at or slightly ahead of the Leopard 2 in the area of electronics,” the report said.

While the U.S. has looked at the longer 120mm gun tube being adopted by the Germans, the Germans do not use depleted uranium penetrators and may have needed the additional barrel length to equal the lethality of the U.S. system, according to one U.S. officer familiar with current armament development.

The report stressed that lethality was a major consideration in the Abrams’ high ranking, given its overwhelming superiority in the fighting to liberate Kuwait.

JAPANESE TYPE 90

The third-place finisher is a surprise, coming from a nation never known for its tank technology. The Japanese Type 90, built by Mitsubishi, visually resembles the Leopard 2, uses the 120mm gun originally developed by Rheinmetall, and adds an automatic loader, permitting a three-man crew. Neither the government or the contractor have put out much information on the Type 90, making it a sort of “mystery tank,” but the Type 90 is, according to the report, “thoroughly modern and sophisticated, even more advanced in some of the areas of fire control and vehicle electronics than the highly publicized (French) Leclerc, Leopard 2A5, and M1A2.

“It is the fire control suite and advanced vehicle electronics that really make the Type 90 a world-class tank. The well known Japanese prowess in electronics has been exploited to the fullest extent in



The Japanese Type 90 is armed with the same German-developed gun as the U.S. Abrams. Its vehicle electronics reflect the advanced technology of Japanese industry.

the Type 90. While some details remain clouded in secrecy, the fire control suite has an automatic target tracking capability and it has long been rumored that some sort of target recognition/queuing and/or threat prioritization capability is incorporated in the suite.”

The Type 90 is powered by a 1,500 hp Mitsubishi diesel that provides a power-to-weight ratio similar to other world-class tanks. At 50 tons, the Type 90 is less heavily armored than designs intended for combat in Western Europe and the crew compartment is thought to be cramped.

“All these things considered, the Type 90 is one of the top operational tanks in the world today,” the report concludes.

FRENCH LECLERC

Close behind the Type 90 in the ratings is the new French MBT, the Leclerc, which is in use by the French Army and, with a German diesel, won the United Arab Emirates competition for a new

tank, edging out the British Challenger 2. The Leclerc features advanced electronics, with a data buss and an advanced fire control system. Its 120mm cannon has an autoloader, permitting a three-man crew, and a 140mm gun is in development and has been demonstrated for an export customer. The turret is all-electric.

One interesting feature of the French MBT is a modular armor system, allowing the protection to be tailored to the threat.

BRITISH CHALLENGER 2

Aside from a new gearbox, the hull of the new Challenger is similar to the hull of the Challenger 1, but the turret is so vastly improved that the Challenger 2 could be called a new tank, according to the report. “The tank was lacking in the all-important area of fightability, mainly due to the poor design of the turret and some problems in fire control components. These problems have been more than put right in the Challenger 2 turret.”



British Challenger 2: A new turret makes a difference.

The new design includes a data buss, new electronic components, and fire control components similar to those on the M1 and the Leclerc. Armor is second-generation Chobham, the layered armor system originally developed by the British. The Challenger 2's high pressure gun is rifled, and all ammunition is stored below the turret ring. The report notes that the Challenger gun claims the longest-distance tank kill in history, a shot of over 4,000 meters in the Gulf War.

RUSSIAN T-80UM2

The Russians have made a second attempt to apply gas turbine engine technology, and this version is apparently more trouble-free than the first engine, a modified helicopter power plant. This version differs from the earlier T-80U and "differences are so significant that the tank warrants a position all its own in our rankings," the report said.

An all-new turret that resembles the blocky shape of the M1 and Challenger 2 turrets accommodates an automatic loader in the turret bustle, a much safer alternative than the Russian carousel loaders located on the turret floor in earlier tanks. The loader incorporates an automatic fuze setter and the ammunition is now unitary, rather than separately loaded projectile and propellant. It's presumed that this T-80 can also fire antitank guided missiles through the main gun tube, an area of technology that Russia first developed. The fire control system is better, approaching the level of the systems on modern Western MBTs.

The main armament remains the 125mm smoothbore cannon which, with the new loading system, can attain a much higher rate of fire than earlier Russian designs.

The Russians have also invested heavily in novel protective systems, including both explosive reactive armor (the Kaktus system) and the Arena active defense system, another technology in which the Russians lead the world.

Counting against the T-80 in the ratings was the tank's poor reliability in recent action in Chechnya, traced to poor workmanship and quality control. It was also seen as vulnerable to crude weapons in the hands of a fairly primitive foe, leading to questions about the tank's likely performance against a first-line opponent.



The Korean Type 88/120 "Baby M1" has been upgunned to 120mm from 105mm.

KOREAN TYPE 88/120

Designed by the same team that developed the M1, the Type 88 appears to be a "baby M1." It was recently upgunned by the manufacturer, Hyundai, with the M256 120mm cannon that has become a world standard, and its fire control system has been improved with components the report called "equal to or even superior to those used on the M1." The Type 88 is powered by a diesel engine.

RUSSIAN T-90

Based on the T-72, but "so different that it warrant a new designation," the report said of this newly standardized Russian MBT. Diesel powered, like the T-72, it is protected by the Kontakt explosive reactive armor system and a laser warning device, along with the Shtora-1 countermeasure system, intended to spoof infrared guidance systems. The 125mm armament can also fire the Refleks laser-guided missile through the gun tube. Questions remain about the tank's sur-



The Russian T-90, newly standardized by the Russian Army, features explosive reactive armor protection and a self-defense suite to protect against infrared-guided weapons. This model is based on the T-72 series.

vivability and overall quality control, and the report also notes that the turret is cramped, reducing fightability. The survey rated the Ukrainian T-84 as similar to the T-90 in most respects.

RUSSIAN T-72

An older design "that can be improved only so far," the report concluded about this 1960s-era design. But its low cost, relative to the competition, is its saving grace. The 125mm cannon in this model is fed by a carousel loader, considered a survivability disadvantage.

ISRAELI MERKAVA MARK III

Calling this design outside the mainstream of current world tank development, the main reason the Merkava ended up at the bottom of the Top Ten is its poor power to weight ratio, which limits its mobility. The tank received high marks, however, for its 120mm standard cannon, fairly advanced vehicle electronics and fire control, threat warning system, and a level of protection among the best in the world, with its front-mounted engine and modular armor packs.

The survey concluded that in many ways, the Merkava was not comparable to others in the survey because it "reflects the unique requirements and doctrine of Israel; to that nation, the Merkava represents the best balance" of factors, although this might not be the case elsewhere.

Soviet-Russian Tank Turret Armor: The Cold War Shell-Game

by James M. Warford

Until very recently, detailed information concerning modern Soviet/Russian main battle tank (MBT) armor was virtually non-existent. Over the years, the Soviets, and now the Russians, have been very successful in maintaining almost total secrecy in this critical area. This “status-quo” was maintained until two major historical events provided an unprecedented view of Soviet/Russian tank design, Operation Desert Storm and the collapse of the Soviet Union. These two events not only led to the discovery of critical information concerning Cold War armor designs, they also provided a glimpse into the armor protecting present-day Russian MBTs.

While battle damage assessment conducted during and after Operation Desert Storm provided a wealth of information concerning the armor protecting many of the tanks employed by the Iraqi Army, including the 5-layer laminated glacis armor carried by the T-72M1 MBT, details of the armor protecting the turrets of many Soviet/Russian MBTs remained a mystery. Since no photos have appeared showing any internal detail of these turret armor designs, most of the analysis over the years has been based on speculation. This all changed with the historic collapse of the Soviet Union. Suddenly, Russian sources were available at an unprecedented level to help clear away some of the mystery. Russian books like *Obozreniye Otechestvennoi Bronetankovoi Tehniki, 1905-1995*, by A. Karpenko, and *Main Battle Tanks, 1993*, by V. I. Murankhovski, have helped to both confirm and deny some earlier speculation. According to Murankhovski, the T-72's turret frontal armor (referring to variants developed after the T-72 Base Model and T-72M/T-72G MBTs, which have all-steel turrets), is a three-layer composite, an outer layer of steel, a center layer of sand or *kvartz* (quartz), and an inner layer of steel. Murankhovski also describes the T-64A MBT's turret frontal armor as a similar although more advanced three-layer composite known as “Combination-K.” It consists of inner and outer layers of steel, with a center layer of combined *steklotekstolit* (a glass fiber material) and

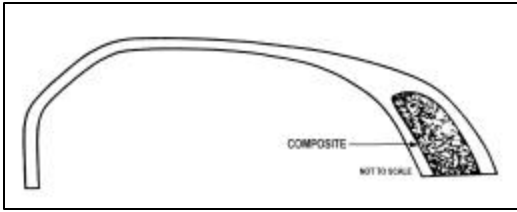


Captured Iraqi T-72s gave Western analysts a closer look at the turret armor of Soviet tanks. This tank was captured by the 24th ID and shipped to the Patton Museum for display. It is seen here being unloaded from a flatcar on arrival at Fort Knox.

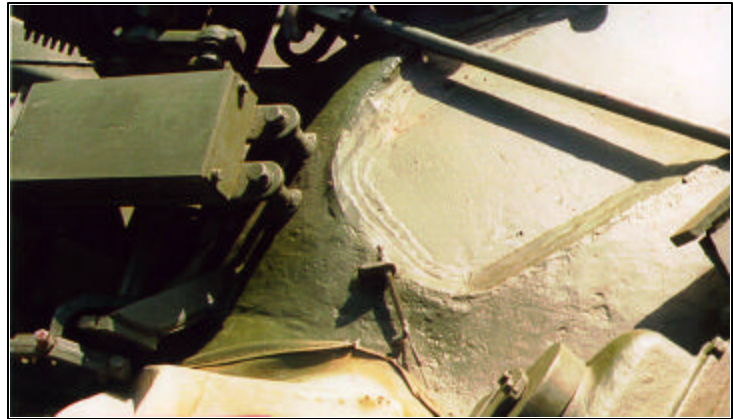
a package of ceramic plates. According to Karpenko, the ceramic material used in the T-64A's composite armor is called “corundum,” which is a very hard native alumina. The Russian spelling of “*kvartz*” is important here since it may in fact be the source of the “K” in Combination-K armor. While not identified specifically, the name Combination-K implies some relationship between the T-64A and *kvartz* composite. When in production, these tank turret shells are cast with a frontal internal cavity on each side of the main gun; each cavity is then filled with the desired composite material. If viewed in profile, the filled cavities represent the center layer of the three-layer composite.

Interestingly enough, the use of quartz in tank armor is not unprecedented; in fact, it was tested as part of a U.S. Army program involving the M4A3 Sherman tank during World War II. In an effort to provide protection against the German Army's Panzerfaust anti-tank weapon, an M4A3 was fitted with an armor “kit” incorporating a mixture of quartz gravel, asphalt and wood flour known as “HCR2.” This add-on armor was successfully live-fire tested in September 1945 against both the German Panzer-

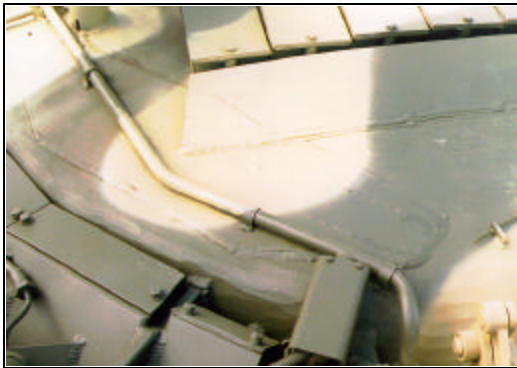
faust and 76mm High-Velocity Armor Piercing (HVAP) ammunition. Additionally, other Russian sources describe the center layer of this three-layer composite as consisting of *peschanye sterzhni*, or “sand rods” or “sandbar.” Based on the possible configuration of the T-64A's armor cavities shown here, designed to tightly confine the composite material, “sandbar” may be the more accurate description. It's important to remember here that the sand in question is probably not typical loose-grain sand. It could actually be a form of silica similar to the “fused-silica” developed as part of a 1952 U.S. program to provide post-war tanks with built-in protection against shaped-charge projectiles, without sacrificing protection against kinetic-energy projectiles or increasing the tank's total weight. Fused-silica composite was selected for this program because it does not “flow plastically” after an impact like steel does. Instead, it rebounds after the shock wave and radially bombards attacking shaped-charge or high explosive anti-tank (HEAT) jet particles and prevents the jet from forming properly — thus degrading or preventing penetration of the tank's base armor. According to *Military Parade*, the official magazine of the Russian



A cut-away, profile view of a possible T-64A tank turret detailing the three-layer composite. (Drawing from USAREUR Intelligence Study: Warsaw Pact Tanks in the Forward Area, regraded Unclassified on December 15, 1998.)



Close-up of the T-90S turret roof detailing the right-side composite armor cavity. Note the depression in the turret roof above the cavity.



At left, a close-up of the T-80U MBT turret roof detailing the right-side composite armor cavity. Note the cover plate welded flush with the turret roof, thus eliminating the depression.

INSIDE SOVIET ARMOR

military industrial complex, Russian three-layer composite armor works in very much the same way. The composite actually absorbs energy as the HEAT jet pushes its way through the materials confined within the armor cavity. Since the energy is then also confined to the cavity, the only direction it can move is back into the path of the attacking HEAT jet. The resulting “active destructive effect” of this movement within the cavity defeats the attacking HEAT jet. The idea that this kind of protection could be incorporated into a cast-armored tank turret has been the subject of debate during and since the Cold War. Some Western analysts incorrectly felt that composite armor required the tell-tale use of flat “box-like” welded plates.

The reality is that the use of cast tank turrets does not in any way negate the employment of composite armor, a reality that not only the Soviets fully exploited, but one that the U.S. Army tested as well with the U.S. T-95 MBT program (1954-1961). The T-95 prototypes were very similar to the Soviet T-64; in fact, the first and second prototypes of the T-64, the *Obiekt 430* and *Obiekt 432*, appeared during virtually the same time period — 1960 and 1963 respectively.

Combining the T-95 program and the newly developed fused-silica composite

armor resulted in the construction of 36 siliceous-cored T-95 turrets. These turrets were subjected to successful live-fire testing from June 1, 1958 to August 1, 1960. At the completion of these tests, it was determined that fused-silica composite armor provided superior protection against HEAT projectiles, and at least equivalent protection against solid shot armor-piercing projectiles as that of an equal weight of conventional steel armor.

While the shape of Soviet tank turrets went through some not-so-subtle changes over the years, these internal cavities remained invisible. The well-kept secret of their existence was unexpectedly made-public with an improved frontal armor design that was incorporated into several of the more recent Soviet Cold War tanks; including the T-72B1, T-72B, T-72S, T-80U, and T-90S MBTs. On these tanks, the cavities actually come through the turret roof, where they can easily be seen when viewed from above. On the T-72B-based variants (T-72B1, T-72S, and T-90S), the cavities have been covered by armor plates inset below the top of the turret, leaving two large depressions in the turret roof.

On the T-80U series (T-80UD, T-80UM, and T-80UK), the cavities are still visible but they are covered by plates that are fitted flush with the turret roof, effectively deleting the two depressions. This

change in turret armor design may have been based on the desire to allow the contents of each cavity to be easily upgraded during the life of the tank.

There is no doubt that the information made available since Operation Desert Storm and the collapse of the Soviet Union is critical to the study of Soviet/Russian MBT armor design. The new information included here, however, still relates to Soviet tanks dating back to the 1973 to mid-1980s time-frame. So, in effect, this represents new information on some relatively old armor designs. Normally, the challenge now would be to try to relate this information to the armor protecting Soviet/Russian MBTs developed since those discussed here. Contrary to what was normally expected, however, the strong desire to increase armored vehicle exports has convinced the Russians to openly provide information concerning some of their most modern MBTs. According to *Military Parade*, the T-80U-M1 *Bars* (“Snow Leopard” MBT — first seen by the public in September 1997) carries a turret incorporating “combined filler.”

Perhaps the most important conclusions that can be drawn from these armor descriptions are: first, while certainly improving the composite materials used over the years, the Russians continue to employ the same basic armor designs that



Pockets in the turret casting of the U.S. T-95, an experimental tank, were filled with fused silica, a form of quartz sand, as an element in the tank's armor protection. It was believed that the silica would protect against HEAT warhead penetration and be no worse than steel armor in defeating kinetic energy attacks. Note also that the track system had no return rollers.

protected their tanks during the Cold War; and second, until the newly-designed "Next Russian Tanks" or NRTs (production models of the T80U-M2 Black Eagle MBT from Omsk, and the

"Uralvagonzavod MBT" from Nizhni Tagil) that have been looming just over the horizon start to roll off the production lines, these same armor designs will protect Russian MBTs well into the future.

James M. Warford was commissioned in Armor in 1979 as a Distinguished Military Graduate from the University of Santa Clara, Santa Clara, California. A frequent contributor to *ARMOR*, Mr. Warford has held Armor and Cavalry assignments ranging from tank platoon leader to brigade S3, and has served as a tactics instructor both at Fort Knox, Kentucky for AOAC, and at Fort Leavenworth, Kansas for CGSOC. Mr. Warford retired from the Army on September 1, 1996 and was awarded the Silver Medallion of the Order of Saint George. He is currently employed as an employee development analyst in the Kansas City area.

Scout Vehicle Designs Must Allow for Easy Dismount

Dear Sir:

...I recently read the January-February 1999 issue of *ARMOR* and was pleased to see the in-depth article on the Future Scout and Cavalry System (FSCS), and the very informed authors' concept of the future vehicle. Nothing catches the attention of a scout like the thought of new toys. At first glance, the authors' concept vehicle is a very attractive option. The sensors that can detect movement near and far, the ability to "lase" targets, the crew-less turret, the up-gunned weapon system, and the digital up-link are all very appealing to the eye. The purpose of this letter is not to argue for or against the authors' concept vehicle, but rather against a trend in future vehicle design: an inability to work in the real world. Bear with me.

The biggest thing that sticks out in my mind is that most vehicle designers don't take into account the fact that combat troops DISMOUNT a lot. A vehicle cannot climb a forested hillside that must be cleared. A mounted crew with its full sensor array can't HEAR anything. The high tech and very expensive sensors can't see around a bend in the road. And for all its incredible capabilities, it can't pull its own local security. Only a dismounted scout can trudge up a steep mountain with only the terrain and his own physical fitness to protect him. Only a dismounted scout can run up to a bend in a road and peek around it with little risk. Only a dismounted scout can detect the RPG-toting,

mud-covered guerrilla fighter slithering into his Tactical Assembly Area. Only a dismounted scout can keep non-combatants, refugees, and Civilians-on-the-Battlefield (COBs) away from his track and maintain situational awareness.... Scouts cannot effectively perform their mission without dismounting. Every concept vehicle I have ever seen does not adequately address the need to dismount. The Armored Engineer Vehicle (AEV) based on the M1 in the same issue of *ARMOR* is a fair example of this disregard. A clamshell door no wider than a couple feet is the point of entry and exit to a cramped little portion of the vehicle. Dragoons (infantrymen/cavalrymen whose purpose is to dismount) are an afterthought of the concept designers. And when they are thought of, it is usually to excess.

I look at this new vehicle and see a very capable and a very exciting reconnaissance platform, but I also see a flawed vehicle. There is no way a soldier can be expected to operate that vehicle, stop, open his hatch, get his gear on, jump down to the ground, and scout ahead. Doing that once would be a tiring process, much less the number of times such a procedure would be necessary on an actual mission. Every halt longer than a few minutes, every bend in the road, every forested treeline, and every time, this frustrating process would be necessary. And if a designer was told to do something about this, I don't doubt there would

be some very elaborate seats made, when all a dragoon wants for is a place to rest with his gear on, or at the very least, nearby and easily accessible.

Somebody once asked me what I thought the best scout vehicle would be (a common question these days among scouts). My reply was a Toyota truck with four well-equipped dragoons in back. By well-equipped, I mean with the most miniaturized ammo (e.g., PRC-127s for short range, or a SABER for longer), compact weaponry (M-4s), the best sights available (thermal rifle scope, PVS-7Ds), and being physically fit. While the Toyota truck is a little simplistic and not real survivable against an equal opponent, I believe my point is made. There isn't a vehicle or sensor in existence that can hope to replace the dismounted scout. It is my fervent hope that the designers of tomorrow's Army and the Army After Next take my enlisted perspective into account the next time they hit the drawing board. Lt. Col. Douglas Macgregor cautioned in his outstanding book, *Breaking the Phalanx*, the danger of our high-tech army having its laser rangefinder smashed by a rock. I hope his words are heeded and that the role of the dragoons, the dismounted scouts, is never forgotten and always included in any future designs.

DWAYNE C. THACKER
Sgt., Scout Plt., 1-37th Armor
Friedberg, Germany

Developing Cavalry Reconnaissance Doctrine for the Next Century

by Lieutenant Colonel Mark J. Reardon

Introduction

This article does not propose that cavalry should abandon its existing security mission, concentrating instead on its role as a reconnaissance organization. The Armor Force, however, must recognize that cavalry can perform a far more valuable service gathering information than perhaps has been envisioned in the past. The lure of technology as a means of collecting information on the expanded battlefield of the 21st century is indeed a strong one, especially when it is offered up as an attractive alternative to sending soldiers "in harm's way." While no one will argue that reconnaissance is not inherently dangerous, especially when it is conducted deep within enemy territory, embracing technology too closely will undoubtedly lead to a one-dimensional approach to information collection. Applying a one-dimensional approach during future conflicts against an adaptive foe that is leveraging asymmetrical means to overcome our technological advantages will assuredly result in unnecessary casualties.

While all combat units are capable of conducting offensive, defensive, and security operations, whether as a component of a combined arms force or by themselves, few organizations can lay claim to possessing a well-honed ability to systematically gather detailed information. Armored cavalry squadrons and regiments, however, offer the division and corps commander with an unmatched capability to conduct reconnaissance across the breadth and depth of the battlefield in spite of our adversaries determined attempts to safeguard critical information. Employment of armored cavalry to conduct reconnaissance will also provide the commander with a sustained capability to gather information in all types of terrain and weather, from stand-off distances or in close proximity to enemy forces. Cavalry not only obtains information, but it also processes it and evaluates it. Yet the current edition of *FM 17-95, Cavalry*, continues to slight this capability by focusing on offensive, de-

fensive, and security doctrine more applicable to the Cold War than information-based land operations of the 21st century.

The Cold War is not a thing of the past. There are far fewer cavalry squadrons and regiments now than there were ten years ago, but commanders still tend to employ them in an economy of force or security role rather than for collecting information. Cavalry is viewed as a recipient, not as a participant, in Information Operations (IO). As a result of that perception, cavalry doctrine does not discuss in depth the crucial relationship between reconnaissance and IO.

How many recent Battle Command Training Program (BCTP) exercises have witnessed the divisional cavalry focused on conducting an advance guard during the initial offensive phase? After repeatedly clashing with enemy security forces, the divisional cavalry is normally forced to begin reconstituting as its parent formation transitions to the defense. By continuously employing cavalry to conduct missions other than reconnaissance, the division is not taking full advantage of its capabilities to contribute to the common operational picture, and, more importantly, the division commander's situational awareness. One cannot "blame" the division staff for this tendency, for the staff relies on *FM 17-95* to assist them in determining the appropriate methods to employ the squadron.

For want of another reference, commanders and staff members at all levels have turned to *FM 17-95*, for the definitive word on reconnaissance. This attitude is mirrored within the TRADOC community, where most proponent centers and schools view Fort Knox as a primary player, if not the lead agency, for reconnaissance doctrine. However, *FM 17-95* misses the mark when discussing reconnaissance, largely because it continues to perpetuate what some term as "The Fulda Gap Syndrome," a focus on security, defensive, and offensive operations to the detriment of armored cavalry's one unique aspect, its ability to gather infor-

mation in all types of terrain and environmental conditions. With virtually the entire Army reading *FM 17-95* to gain an understanding of reconnaissance, continued neglect of this topic within the manual, which is scheduled to undergo revision starting in February 2000, would magnify an already significant doctrinal void.

Lacking an appreciation of cavalry's reconnaissance capabilities, commanders instead rely heavily on MI collection assets for critical information. While intelligence assets can gather that information, they are susceptible to electronic spoofing and operational security (OPSEC) measures. Some intelligence collection systems are dependent on input generated by enemy activity (radio emissions and movement of forces); e.g. they cannot be expected to gather information from an enemy using passive measures to conceal his presence or intentions. The MI community has invested significantly in procuring information by technical means, and in the process it has sacrificed its organic capability to gather information by physical means (Active Component Long Range Surveillance assets). As a result, the S2/G-2 has come to rely heavily on maneuver assets, especially during stability and support actions, to provide analysts with information that can only be gathered by active means, e.g. interpersonal contact.

Over-reliance on joint and national systems, such as JSTARS, U-2, and satellites, can also lead to an operationally limited approach to collecting battlefield information. Many national and joint systems were developed and fielded to detect, track, and identify mechanized Warsaw Pact formations. This capability will have limited utility in scenarios where our adversaries are largely composed of insurgent elements or conventionally organized light infantry. Potential adversaries that hope to employ mechanized forces are fully aware of the fact that our advantages in precision weaponry and digital communications can be negated or significantly reduced by deny-

ing an accurate picture of the battlefield to U.S. commanders. They will seek to preserve their own operational capabilities by neutralizing joint and national information gathering platforms using means that we have not anticipated.

Our adversaries' awareness of our technological advantages, and their ability to neutralize them, is only one of several challenges faced by Army forces seeking information provided by joint and national assets. Another is that these assets may be focused on areas that have other immediate priorities. For example, the Joint Force Commander (JFC) may be focusing these systems on Weapons of Mass Destruction (WMD), directing all available platforms to locate enemy storage areas and delivery means.

Weather and enemy action may also degrade the capabilities of joint and national systems. As a result, division and corps commanders may discover that supporting joint and national systems are not available during critical periods.

By focusing cavalry on reconnaissance across an expanded area of operations, we will present our adversaries with an enormously complex challenge as they seek to employ countermeasures against Army, joint, and national information gathering systems. Cavalry can actively penetrate enemy deception measures while simultaneously forcing the threat to commit significant maneuver resources to safeguard information. Cavalry can contribute significantly to the Army's ability to achieve the operational capabilities required for the 21st century battlefield by virtue of its unique ability to exploit both human and mechanical means, as well as active and passive techniques, when gathering critical information. However, the Armor Force must revise existing doctrine to ensure that cavalry's potential is fully realized.

Looking Towards the Future: A First Step

It is apparent from a review of past reconnaissance doctrine that incremental change has been the norm. This was acceptable as long as the dynamics of modern conflict evolved incrementally and the U.S. Army maintained a robust capability to conduct combat operations. With the expanded battlefield, proliferation of precision weaponry, urban growth, and greater likelihood of being committed to "complex" operational environments — e.g. stability actions and support actions — coupled with the downsizing of our Army, the time for evolutionary change

has passed. Armor doctrine must be revised to recognize that cavalry possesses a singularly viable and unique information gathering capability as well as substantial combat power.

Limiting discussion in *FM 17-95* on how cavalry conducts reconnaissance, however, does not address the entire issue of doctrinal change. *FM 17-95* must look beyond the internal workings of cavalry organizations to explain how reconnaissance relates to the information operations hierarchy. Do not depend on other proponents to articulate the process by which cavalry can provide the commander with a robust capability to gain and maintain a common operational picture. The Army as a whole is too enamored with the pursuit of technology to explain how information operations result in increased effectiveness on the battlefield. To date, the articulation of how the employment of IO translates to success at the tactical echelon of command remains an elusive concept.

FM 17-95 must also clearly demonstrate that cavalry is part of a "system of systems" that make up the Intelligence, Surveillance, and Reconnaissance (ISR) architecture tasked to collect information for the commander. While the acronym "ISR" has been used by many, few possess an understanding of how each function relates to the other during planning, preparation, and execution. By examining IO from a maneuver perspective for the first time, *FM 17-95* potentially can address a number of voids that currently exist.

Linking IO and Reconnaissance Operations

Given our fascination with the technological and managerial aspects of digital communications, it is not surprising that the Army has glossed over the fact that IO includes the active collection of information. How can we consider the issues associated with information management, connectivity, offensive IO, defensive IO, etc. when there is little or no information to act on in the first place? Information collection conducted by cavalry provides the Army with the link between IO and the traditional maneuver battlefield so clearly lacking. Aren't we trying to gain advantage by denying critical information to the enemy through a combination of defensive and offensive measures? If so, then we must expect the enemy will attempt to do the same to us. During combat operations, dependence on standoff sensors linked via digital

channels to the "military information environment" and "global information environment" may not satisfy all of the commander's information needs in the face of active threat countermeasures. We must be prepared to send cavalry scouts into "harm's way" to pierce the "fog of war."

The draft version of *FM 100-6, Information Operations*, defines IO as "actions taken to affect adversaries' and influence other audiences' decision-making processes, information, and information systems, and defend friendly decision-making processes, information, and information systems." Reconnaissance plays a significant part, either directly or indirectly, in information operations at the tactical through strategic echelons of command. It does this by collecting and verifying critical data required by the commander to plan, prepare, execute, and assess. This critical data is known as "relevant information." Relevant information is "all information of importance to the commander and staff in the exercise of command and control."

In the face of an adaptive threat, the detail, timeliness, and accuracy of information is directly related to the type, capability, and allocation of collection resources, as well as the emphasis placed by the commander on gathering specific types of information. Cavalry provides the commander with a versatile, tailorable, and robust capability specifically organized and trained to safeguard or collect information. It can often be employed to collect or verify information that cannot be gathered by other means. Cavalry has the ability to use a variety of techniques to collect information on the activities, disposition, and intentions of enemy, friendly, and neutral parties. It is equally well suited to assess the impact of terrain and weather on military operations.

What are the payoffs when armored cavalry performs effective reconnaissance? Reconnaissance contributes to information superiority. Information superiority is translated into operational initiative by the commander's ability to maintain an advantage over the enemy in terms of information collection, offensive/defensive IO, and information management. By employing information collection assets in an integrated and complementary manner, the friendly force can gain situational awareness faster than its adversaries. By gaining situational awareness more rapidly than the enemy, the friendly commander will be able to

make informed decisions while the enemy is still trying to collect sufficient information to initiate their decision-making process. If a truly significant disparity is achieved, the enemy commander may fail completely to recognize an unforeseen battlefield opportunity or threat posed against a decisive point. Thus, the friendly commander is able to set new conditions while the enemy commander is still operating in accordance with his original, and outdated, plan.

Once information superiority is achieved, the friendly force will be able to consistently recognize when the plan must be modified or discarded to meet changing battlefield requirements. Information management, coupled with the efficient use of information systems (INFOSYS), permit the friendly force to compress the decision-making process while simultaneously reducing the level of risk associated with decision-making by ensuring accurate information is continually on hand. Information systems support collaborative planning at multiple echelons, as well as the rapid distribution of the plan once it is completed. By compressing the decision-making process, the commander is capable of recognizing, acting on, and exploiting information faster than his adversary. This will result in the friendly force realizing a significant advantage by virtue of the ability to gain and maintain the operational initiative. Cavalry units conducting reconnaissance contribute to this process by supporting the commander's efforts to achieve information superiority at critical points in a campaign or battle.

A Starting Point: Formation Reconnaissance

The British Army was one of the first NATO organizations to realize that post-Cold War developments in doctrine, equipment, and force structure, as well as emerging threat capabilities, had combined to force a change in their approach to combat operations. A review of existing British doctrinal publications revealed that "reconnaissance doctrine derives from the Cold War and largely stems from the requirements of the General Defense Plan (GDP) covering force battle." Further examination disclosed that reconnaissance could provide the British Army with a link between information management, deep operations, and maneuver warfare. Recognizing that revised doctrine would serve as a guidepost for future force development and equipment procurement, in addition to permitting existing systems to be used to their fullest

potential in an evolving strategic environment, the British Army developed the concept of Formation Reconnaissance (FR).

The formation reconnaissance concept recognizes that reconnaissance forces, whether they are called "cavalry" or by some other term, can provide the commander with an "intelligent system" possessing the capability to analyze a situation, counter enemy deception, and apply judgment to bring a measured response. By operating in real time, reconnaissance elements identify opportunities as they occur, or create them when necessary. The ability to produce accurate, timely, and continuous information, coupled with human flexibility, ingenuity, and cognitive reasoning — to include the ability to re-task themselves and retain the initiative at the decisive point — clearly supports the fact that cavalry performs as a key component in the overall ISR effort. *However, in order to realize its full potential in this role, reconnaissance units must have the capability at platform and unit level to leverage information provided by the other components of the ISR system.*

Emerging British FR doctrine also calls for dramatically expanding the traditional area of operations in which armored reconnaissance assets are normally employed. For example, corps reconnaissance operates 40-80 kilometers ahead of the main body. A considerable distance would also separate divisional reconnaissance elements from the lead maneuver units of the division. The primary mission of corps and division reconnaissance is to "satisfy the commander's Priority Information Requirements (PIRs), to inform maneuver decisions, and to provide information for 'rece strike' missions on opportunity and high-payoff targets."

Divisional reconnaissance, according to the British Army, will normally operate within the indirect fire and air defense envelope of the division — up to 40 kilometers forward of the main body. Because threat counterreconnaissance efforts will be concentrated in this area, divisional reconnaissance will be more likely to fight for information. Direct contact with enemy forces will occur frequently, resulting in repeated abandonment of stealthy reconnaissance techniques in favor of aggressive reconnaissance. This will require development of a reconnaissance force structure that easily transitions between both techniques. The proximity of other divisional assets will provide the reconnaissance organization

with the necessary combat power to answer PIR despite the enemy's attempts to actively deny critical information to the friendly commander.

While it may seem to some that the emerging FR concept merely westernizes Soviet reconnaissance doctrinal theory, the important point is that the British Army has espoused adoption of a doctrine that is very different from that which NATO armies have followed for the past five decades. In an attempt to balance operational constraints against desired capabilities, the British have actually created a compromise version of what they were aiming for, e.g. dramatically increasing situational awareness across a much greater expanse of the battlefield. However, operational capabilities in the current U.S. Army inventory, coupled with systems that will be fielded in the near future, can provide us with the ability to achieve what the British Army cannot. The U.S. Army has technology and resources that no other military force can hope to match — digital C4I systems, JSTARS, precision fires, capable intelligence collection systems, and a robust rotary wing aviation capability — all of which are necessary to conduct reconnaissance during information-based land combat in the 21st century. All the U.S. Army lacks is a comprehensive doctrinal construct designed to bind it all together.

Reconnaissance in Support of Information-Based Land Combat

FM 17-95 cannot continue to focus exclusively on the tactical echelon of command without confining cavalry's relevance to a very small, albeit important, portion of the battlefield. This trend is not surprising, however, given the fact that doctrine originally developed during World War II has always tended to limit the employment of cavalry to the forward edge of the battle area. The challenges associated with avoiding decisive engagement by enemy forces, resupply, communications, medical evacuation, and maintenance support were considered too difficult to overcome. Unfortunately, the U.S. Army has never truly stepped back from the perception that the usefulness of cavalry is limited to tactical depths, relying instead on aerial reconnaissance, LRS, and signals/electronic intelligence instead of enhancing the capability of cavalry to collect information at operational depths.

The armored cavalry regiment, with its unparalleled collection capabilities and tremendous combat power, is well suited

to conduct reconnaissance in support of the operational echelon of command. The ACR's traditional area of operations, normally linked to a parent corps, encompasses the requisite operational and physical expanse. The robust capabilities inherent within the ACR also allow the operational commander to maintain a level of situational awareness required to clearly visualize multiple interrelated events, often occurring simultaneously, spanning the entire area of operations. An ACR conducting reconnaissance at operational depths is aided by information gathered by joint and national systems. Committing the ACR, in addition to joint and national systems, will enhance the operational commander's situational awareness at decisive points during critical periods, e.g. the "focused telescope," by massing collection assets where they are most needed. While numerous benefits can be gained by focusing the ACR on operational level reconnaissance, the prevailing notion in the immediate post-Cold War era, that the ACR served primarily as a security organization for the corps, has unfortunately left us with one heavy and one light ACR.

Division and brigade assets require the same capabilities as the ACR to ensure the effective integration of reconnaissance effort. By nesting identical capabilities within corps, divisional, and brigade assets, the Army increases its ability to sustain high-tempo operations, where elements of one echelon may relieve another at any point on the battlefield in order to facilitate reconstitution, resupply, and reorganization. In too many instances in the past, we have called upon cavalry to do too much, too often, and with too few resources. While cavalry has normally accomplished those missions, despite considerable obstacles placed in their path by the enemy, it came at a price the commander could ill-afford in the long run — a slowly deteriorating picture of the battlefield as the operation progressed. With the inevitable arrival of the "fog of war" came culmination and casualties. With the reduced force structure of today's Army, combined with a National Military Strategy calling for rapid conflict resolution, we really can no longer afford to encounter the "fog of war" at any point in a future campaign.

What Should the New *FM 17-95* Include?

The attempt by the British Army to redefine the role of reconnaissance in the 21st century can serve as an impetus to our own efforts; however, we should not

be bound by their emerging concept. As noted previously, the U.S. Army possesses unique systems that enhance the ability of cavalry to conduct reconnaissance. First and foremost, we need to realize that cavalry is not alone on the battlefield when it comes to conducting reconnaissance. It is bound functionally, and through communications linkages, to other systems within the ISR architecture. Rather than focusing exclusively on the internal aspects of how cavalry conducts reconnaissance, *FM 17-95* must recognize that cavalry is inextricably joined with MI assets, as well as joint and national collection systems. These linkages enhance the cavalry's ability to conduct reconnaissance over a much wider area of operations, thus increasing the relevance it possesses on the 21st century battlefield, a capability that is especially useful considering the comprehensive information collection requirements of IO.

Nor have we articulated techniques that support the continuous employment of cavalry — an approach that will allow the Armor Force to enhance the cavalry's ability to conduct simultaneous, versus sequential, operations. The versatility of cavalry can satisfy many of the tactical and operational commander's requirements, yet we continue to find ourselves mired in internal debate concerning the relative merits of aggressive versus stealthy reconnaissance techniques. In this instance, the British Army has correctly identified the need to rapidly transition between both techniques, thus enhancing cavalry's already considerable flexibility. Increased span of operations, improved ability to conduct sustained operations, and operational flexibility all combine to significantly enhance the relevance of cavalry reconnaissance doctrine as the U.S. Army enters the next millennium.

Cueing Reconnaissance

Cueing provides cavalry with linkages to information collected by the other components of the ISR architecture, as well as a means to focus reconnaissance operations. It allows the commander to tailor reconnaissance by employing the assets best suited to gain information in the detail that he requires. Some examples: based on the report from a JSTARS that it has detected vehicles moving down a road, the commander may employ an armored cavalry troop to gather more information to enable him to make a decision in response to the JSTARS sighting. Conversely, if a RAPTOR minefield detects a tank, the commander may

commit a wide area surveillance system to determine how many armored vehicles are in that area. Another advantage is that cavalry units do not have to be committed on unproductive reconnaissance and surveillance missions. The commander can now choose to not commit his cavalry until a wide area surveillance system detects sufficient enemy activity.

The cueing process involves communication between two or more reconnaissance or surveillance systems, as well as the use of common communications channels dedicated to passing reconnaissance information between units. Cueing can also involve communications between a subordinate reconnaissance element and its controlling headquarters that possesses direct feeds to joint and national systems. Cueing is conducted vertically (when enemy forces cross friendly operational boundaries) or horizontally (within the same echelon of command or area of operations). Effective cueing hinges on communications interoperability as well as the ability of various systems to pass critical information in a timely manner. There are three major categories of cueing:

- **Reconnaissance System to Reconnaissance System.** This category of cueing occurs when a reconnaissance asset does not possess the capabilities necessary to gather all of the information required by the commander. Reconnaissance assets may cue each other for the purposes of defeating enemy countermeasures, confirming contradictory or unclear information, or massing information-gathering effects. Cueing can result in the handing over of responsibility to other reconnaissance systems or necessitate the integration of the efforts of two or more reconnaissance systems. Reconnaissance systems must be able to communicate directly with each other for this type of cueing to be effective. The controlling headquarters, not the respective reconnaissance systems themselves, will authorize this type of cueing to take place and the degree. The decision to reposition systems as a result of cueing information also rests with the controlling headquarters in order to preserve the integrity of the commander's overall reconnaissance effort.

- **Reconnaissance System to Surveillance System.** This involves the exchange of information between reconnaissance and surveillance systems for the purpose of tracking or handing over a target or enemy force. It may also occur when surveillance systems are unable to provide the necessary level of detail re-

quired by the commander, which in turn necessitates the commitment of a cavalry force. When surveillance systems employed to monitor secondary avenues of approach detect enemy activity, this type of cueing may also occur as primary responsibility for monitoring that area is turned over to an armored cavalry unit.

• **Reconnaissance System to Fire Support System.** Cavalry may be employed for the specific purpose of providing information that will result in the destruction of a high-payoff target. Cavalry is used to cue fire support systems when the target is difficult to detect, when the exact target location is unknown, when it is positioned far behind enemy lines, or when it is moving too rapidly for other target acquisition means to be effective. When a cavalry unit is designated to cue the employment of FS systems, it should be provided with dedicated fire support liaison teams that have direct links to the designated FS asset and are capable of precision targeting. Because this scenario can involve the diversion of a cavalry unit to accomplish a critical FS task, the mission to conduct target acquisition should be not accorded a secondary priority by the controlling headquarters or unit commander.

The Great Debate: Stealthy Or Aggressive?

For some obscure reason, the Armor Force seems to believe that a cavalry unit can conduct aggressive reconnaissance or stealthy reconnaissance, but not both. This belief has even manifested itself during force structure debates in recent years. We have HMMWV scouts and Bradley-equipped scouts. They are expected to employ techniques used to gather information on the battlefield that can be classified as stealthy or aggressive. Units employing stealthy reconnaissance techniques avoid contact with the enemy in order to collect information unobtrusively. In sharp contrast, aggressive reconnaissance involves ground and aviation assets, or a combination of both, using maneuver and fires to gain information from the enemy. Simply put, aggressive reconnaissance involves fighting for information because the enemy is actively trying to deny information to the friendly commander or because combat is the only means by which that information can be obtained. While engaging in aggressive reconnaissance, friendly forces normally engage enemy reconnaissance and security elements while avoiding decisive engagement in order to retain freedom of

freedom of action while collecting information.

The decision to use either technique has usually been made on the basis of the reconnaissance unit's equipment. Those equipped with HMMWVs use stealthy techniques to offset their lack of ballistic protection. On the other hand, the lethality and mobility of the helicopter allows air cavalry to conduct aggressive reconnaissance even though rotary-wing aircraft also possess limited physical protection when compared to the direct fire threats found on the modern battlefield. Armored cavalry is well suited to conduct aggressive reconnaissance because of the mobility, ballistic protection, and lethality of the M1 Abrams and M3 Cavalry Fighting Vehicle.

Equipment factors can influence the choice of reconnaissance techniques, but they should not dictate that decision. Employing the various methods should not be viewed as mutually exclusive — cavalry units must be able to use either aggressive or stealthy reconnaissance techniques. Reconnaissance techniques are tailored for specific missions rather than based on platforms. Commanders may find it desirable to employ the M1s and M3s of an armored cavalry unit, especially if they are the only assets available, to conduct reconnaissance in a stealthy manner. They may employ a combination of techniques during the course of an operation based on METT-TC. The commander must also consider the risk of compromising the entire plan or potential for escalation when choosing the type of reconnaissance technique. Once the enemy detects our reconnaissance effort, the activities of cavalry units gathering information can provide the threat with an indication of the friendly commander's intentions.

FM 17-95 should emphasize the fact that both techniques, stealthy and aggressive reconnaissance, are not mutually exclusive. Commanders may find a combination of aggressive and stealthy methods useful given enemy dispositions, varying resources, and environmental conditions. For instance, a commander may direct his cavalry units to use aggressive reconnaissance techniques in the enemy security zone to penetrate the threat counterreconnaissance screen, but once that portion of the mission is complete, those same units may revert to stealthy reconnaissance when they enter the enemy main battle area. Bottom line — the debate that has raged in the past within the ranks of Armor officers is ir-

relevant. Cavalry requires the capability to employ both stealthy and aggressive information gathering techniques if it expects to play an important role on the expanded battlefield of the 21st century.

Sustaining Continuous Reconnaissance

Battle management is as important to reconnaissance as the capabilities of the individual platforms and organizations themselves. Cavalry is not an expendable force. The decision-making requirements of the commander, combined with the frequency with which events take place on the battlefield, will drive the tempo of cavalry reconnaissance operations. Commanders are often forced by operational requirements to commit their cavalry for lengthy periods of time. This can result in unacceptable degradation of equipment and personnel. This tendency is also exacerbated when commanders interpret "never leave reconnaissance in reserve" as implicit guidance for the continuous employment of all cavalry units at their disposal.

The timing of rest and refitting periods is the responsibility of the commander. Pulling a cavalry unit off of the line to prepare for a follow-on mission does not constitute placing that unit in reserve. Commanders must anticipate the need for a fully rested and refitted reconnaissance force based on his vision of future operations and assessment of the risk that may be incurred. Commanders cannot, however, afford to remove a cavalry unit for rest and refitting without replacing it with some other system that has the capability to gather information. Even with this constraint, a number of options still remain available to facilitate the rest and refitting of cavalry in anticipation of continuous operations. Commanders may be forced to rely entirely on internal resources, or they may receive external assistance. These options will vary according to the available resources at each echelon of command, as well as the criticality of operational requirements.

• **Using Assets from Another Echelon of Command.** The commander has the option of requesting the temporary attachment of a reconnaissance asset organic to his higher headquarters for the purpose of temporarily relieving one of his own units. The higher headquarters can provide reconnaissance assets or it can direct another subordinate element to provide the requesting commander with assets. At corps level, the commander can attach one squadron of the ACR to a divi-

sion or direct a division held in reserve to provide their divisional cavalry squadron. In another example, a mechanized infantry division may temporarily provide a troop from the divisional cavalry squadron to relieve a brigade reconnaissance troop (BRT) in order to provide the latter with an opportunity to rest and refit. The gaining commander should assess whether or not he will also require a liaison team and additional CSS assets to accompany the attached reconnaissance unit.

• **Relief by Maneuver Elements.** Specialized organizations, such as LRS, air cavalry, and armored cavalry, are often in the midst of conducting reconnaissance while their higher headquarters plans a future operation. When reconnaissance units are deployed on a screen line or manning outposts, they may not have the time necessary to conduct preparation, rehearsals, and pre-combat inspections due to current operational demands. In these cases, based on the factors of METT-TC as well as the significance that a specific reconnaissance unit may have in an upcoming operation, the commander can authorize a relief in place be conducted between designated reconnaissance elements and a maneuver force. This will enable the reconnaissance unit to conduct TEWTs, brief the operations order, attend rehearsals conducted by other units, conduct briefbacks, and test fire weapons. Granting the reconnaissance unit a limited period of time in which to prepare for a difficult mission undisturbed will provide those units with renewed confidence in their ability to perform successfully during upcoming operations.

• **Relief by Surveillance System.** The commander may choose to employ surveillance systems in lieu of a cavalry unit while the latter is being rested and refitted. The surveillance system should be capable of continuous coverage of the sector in question during the period that the reconnaissance unit is off of the line. The commander must also determine whether he wishes to accept the level of risk that might be potentially incurred by employing a surveillance system that may not have collection capabilities identical to the cavalry unit it is replacing. The IPB process can be used to provide commanders with an assessment of the level of risk associated with this option. If the risk is deemed too great, the commander can choose to limit refitting to a portion of the reconnaissance unit at a

time, while continuing to augment the reconnaissance effort with assistance from surveillance systems.

• **Internal Relief in Place.** Cavalry units may be required to execute rest and refit while simultaneously conducting their assigned mission. Given this constraint, the commander would withdraw a portion of the unit to undergo rest and refit, while the remaining elements continue gathering information. Once the first element completes rest and refit, they assume the responsibilities of that portion of the unit still conducting operations. In the interest of time and METT-TC, this option may force the commander to place greater emphasis on refitting equipment rather than resting personnel.

The Army cannot afford to rely exclusively on standoff electronic sensors to provide commanders in the field with information they need to make critical decisions.

Conclusion

This article has touched on but a few of the topics that must be revised in upcoming editions of *FM 17-95*. For example, conducting reconnaissance at operational depths presents CSS sustainers with an entirely new set of challenges to grapple with when determining how they would conduct maintenance, evacuate casualties, fuel vehicles, etc. If the Armor Force wishes to thrust cavalry into the 21st century, however, it must ensure that its doctrine has relevance. Limiting cavalry to a narrow tactical role, in both an operational and geographical sense, will condemn it to professional obsolescence when set against a greatly expanded and more complex area of operations. Current doctrine seeks to reproduce the Fulda Gap by focusing discussion on the employment of cavalry to conduct security, offensive, and defensive operations for brief periods of intense combat in support of the tactical fight. This approach diminishes cavalry's potential contribution to the process by which the commander gathers critical information that can decisively influence the overall fight.

Additionally, our responsibility to contribute to the Army's collective warfighting capability cannot take a back seat to parochial notions. If the Armor Force does not articulate the linkage between IO and cavalry, will other proponents do

so? I think not. It is also the responsibility of the Armor community to remind the senior leadership that IO must remain relevant to the needs of the commander on the maneuver battlefield. The Army cannot afford to rely exclusively on standoff electronic sensors to provide commanders in the field with information they need to make critical decisions. Reconnaissance should in fact be categorized as a human or soldier endeavor to ensure that commanders are personally involved in the reconnaissance planning process in recognition of the high risk often associated with information gathering. More importantly, the Army has to acknowledge that reconnaissance is a mission, not a platform or organization. *FM 17-95* can play a large part in convincing its readers of these important distinctions.

Cavalry reconnaissance doctrine must remain relevant in an evolving operational environment. As the Armor Force continues to develop doctrine for the 21st century, it must also clearly describe the role that cavalry plays when conducting reconnaissance in support of corps, division, and brigade information-based land combat operations. The past focus on conducting offensive, defensive, and security operations, to the detriment of reconnaissance, must be reexamined to produce a doctrine that can fill the contemporary needs of an information-based force. *FM 17-95* could conceivably evolve to a point where it becomes one of the doctrinal pillars used to bridge the gap between Force XXI and Army After Next (AAN) maneuver forces that use information to enhance precision maneuver and fires. Before that can happen, however, we need to elevate reconnaissance to its proper place within cavalry doctrine.

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Designing the Future Scout/Cavalry System

Will It Be a Scout or Cavalry Vehicle? Can You Have Both?

by Major Todd Tolson

Scouts and cavalry are the commander's principal reconnaissance and security assets. But since the cavalry's horses were retired, the U.S. cavalry has never had a dedicated mechanized vehicle for reconnaissance. Rather, the force has always had to improvise.

Borrowed Equipment

Early experimentation with armored scout cars was eventually abandoned in WWI, and scouts were mounted in jeeps and other wheeled vehicles instead. A dedicated scout vehicle was developed in the 1960s, with the fielding of the M114, but it was underpowered, mechanically unreliable, deficient in firepower, and was eventually retired.

More recent developments, like the XM808 Armored Reconnaissance Scout Vehicle (ARSV) in the '70s, and the cavalry regiments' M8 Armored Gun System (AGS) in the early '90s, were both canceled.

In 1994, the Army stated that the present improvised scout vehicles were inadequate to acquire threat information and will be overmatched by the projected threat by 2005.¹ The current M3A3 Cavalry Fighting Vehicle (CFV) is a refitted M2A3 Bradley (Infantry) Fighting Vehicle, while today's scouts are mounted in armored M1114 High Mobility Multi-purpose Wheeled Vehicles (HMMWV). The employment of these substitute platforms perpetuates the history of cavalry/scout vehicle improvisation. An immediate need exists to correct this current shortfall in ground reconnaissance/counterreconnaissance for the future missions of Army XXI.

Army studies at the National Training Center have shown a high correlation between the success of the scout mission and the success of the supported task force, yet most of the DOD's intelligence gathering research has been focused on satellites, helicopters, and unmanned aerial vehicles (UAV). Environmental and technical conditions limit their capabilities during 24-hour continuous operations. We need a future scout vehicle to complement these assets, providing an

around-the-clock, all-weather capability that is immediately responsive to the ground commander. The Army has made the case that the scout is absolutely essential for the ground component to gain information dominance on the 21st century battlefield.² However, limited budgets will cause the aerial versus ground reconnaissance debate to resurface frequently.

A Reduced Budget

With the end of the Cold War and the resulting change in the U.S. threat, the government not only altered the missions the Army was to perform, but reduced the Army's budget. In the past 15 years, the DOD procurement budget has declined by over 60%, while Army modernization investments have declined by more than 70%.³ The Army has accepted risk in funding weapon modernization programs to focus on near-term readiness, manning, and quality of life programs.⁴

In this atmosphere, the DOD has developed new, innovative ways of leveraging resources to meet America's future security requirements. The new global environment has also led to a new way of doing business in weapons procurement. The Army has changed its internal acquisition procedures and sought external international partners to reduce the cost of obtaining quality equipment.

A Joint US/UK Program

The U.S. Army's requirement for a new scout system remained shelved for many years, but in 1996, the Armor Center at Fort Knox recognized that the United Kingdom's (UK) scout vehicle development project, called TRACER (tactical reconnaissance armored combat equipment requirement), was a program with a similar mission and delivery schedule (2005).⁵ Both countries recognized the advantages of cooperation, and in 1998 signed a memorandum of understanding to design, develop, and field an armored reconnaissance system to meet the needs of both nations. This was the first time the U.S. and U.K. agreed to collaborate

on a program to field a mechanized vehicle.

The international environment fostered a new way of doing business that benefits both countries. Two multinational industry teams were formed to compete for the design and production of the TRACER/FSCS. Since the objective is to obtain an advanced scout vehicle at less cost than two independent programs can achieve, resources are pooled during development, increasing the ranges of technology options available. During FSCS production, economies of scale will contain unit cost, reducing program life-cycle cost.⁶

The program expects to shorten the 15-year product cycle time to 10 years on the TRACER/FSCS program, a 33% reduction. By having an international cooperative team pooling greater sources of technology and innovation, the Army estimates a savings of 30% during development, 20% during production, and another 20% savings in life-cycle cost.⁷

At the conclusion of the 42-month concept phase, the two governments will select one concept design team in 2002 for further development and testing. The team that best blends a wide variety of component capabilities into a technological advanced system, while meeting the tactical and cost requirements of both nations, earns the contract. Production will commence in early 2005 with over 1,200 FSCS and 400 TRACERS.

Internal Acquisition Reform

Along with the agreement to co-develop the FSCS with the British, the new global environment led DOD to change its acquisition process. In the past, cost and schedule were flexible; the emphasis was on enemy "overmatch" performance. These performance requirements were relatively fixed (independent variable), while cost increased (dependent variable) to meet schedule. Performance was demanded at any and all cost.

CAIV (Cost As an Independent Variable) is the new acquisition philosophy where cost is treated as the independent variable. In this process, it may be



The M114 APC above, was another misdirected attempt at a scouting and reconnaissance vehicle. Seen here crossing a ford in tests at Fort Knox, it was less successful crossing paddy dikes in Vietnam, and was withdrawn from service.

Scout Vehicles: A History of Improvisation



necessary to trade off some elements of performance in order to meet previously established cost objectives. CAIV gives industry the flexibility to design systems that meet overall requirements at a reasonable cost. One of the most difficult problems in vehicle design is selecting components for a final system design. Models and virtual prototyping are used to isolate the performance-cost-risk "trade space" and identify the best vehicle value within constraints. CAIV provides a series of optimized vehicle options to assist in final vehicle design selection.

FSCS Design and Capability Issues

The tricky part of designing a combat vehicle is to determine what minimum

performance capabilities must be included in the architecture to accomplish its missions, at a unit cost that will keep the "budget minded" happy. The problem with determining these mission capabilities for the FSCS is that the fundamental scout role of reconnaissance and reporting (stealth) conflicts with the cavalry's additional offensive and defensive (fire-power) missions as an economy of force. So, to balance these opposing scout/cavalry requirements, all missions are analyzed and reduced to the task level, and the tasks are counted and then weighted by their collective use in various missions. These weighted tasks are used to establish both the essential key performance parameters (KPP) and those that can be traded off. This type of analysis provides mathematical support for establish-



Prior to WWII, the Army purchased armored scout cars, like the one above, to perform reconnaissance, but the lowly jeep became the most common scout vehicle during the conflict. Another improvised solution, below, was an M5 light tank with its turret removed and replaced with a .50 cal. machine gun on a ring and trolley mount.



Another makeshift scout vehicle was the M8 armored car, at left, seen in combat in France in 1944. Much of the Army's postwar aversion to wheeled scout vehicles may have originated when soldiers experienced the limitations of the M8, but it was never intended for scouting. Essentially, it was a 2-1/2-ton truck with an armored body and a light tank turret mounting a 37mm gun. Its advantages included being cheap and available in quantity at a time when industry struggled to build enough tracked vehicles.

ing a few "common sense" traits (KPPs) that any FSCS vehicle would need to have incorporated. But the real issues are exposed when deciding whether the vehicle is going to favor executing scout versus cavalry operations.

The scouting philosophy is, "while conducting reconnaissance, don't be seen." If seen, don't be hit. And if hit, don't be killed. A vehicle that focuses capabilities on the first requirement of "not being seen" may accept risk in the other two areas. Yet looking at the many concept pictures of the FSCS generates visions of the cancelled Armored Gun System (AGS).

Key features of a stealthy vehicle would be quiet operation, a low profile, speed, and ease of maintenance so it can be

sustained without assistance. The easiest method of reducing the noise level is to select wheels and a quiet gas/electric engine. While there has been promising research to reduce the clatter of tracked vehicles, including double-pin and banded track, wheels should remain quieter for some time to come.

Visually disappearing is a tough requirement, especially with advances in IR, radar, and thermal sensor technology. Currently, there are new developments with CARC paints and camouflage fabrics that will both reduce the infrared and thermal signatures of vehicles and provide protection from the missile-seekers on smart munitions. Although these measures sound promising, in a future war's "fight for information," any scout that is identified will be a priority target for destruction. A low-silhouette vehicle that can avoid detection is the key for scout survival in these future engagements.

A small, stealthy scout vehicle would be adequate if the cavalry didn't have its economy of force missions of guard, attack, delay, etc. A true scout vehicle may only require a medium caliber weapon (20-25mm) for self-defense and would use stealth to avoid engagement, but a cavalry vehicle requires a larger caliber (35-45mm) weapon to defeat enemy lightly armored vehicles. Cavalry engagements also demand increased armor protection to withstand the "counter-punch" of medium/large caliber enemy fires. "Pure" scout vehicles can accept some risk in this area, by avoiding contact/detection; a cavalry vehicle cannot.

The U.K. plans to solve this dilemma by building 30 of the vehicles with an "overwatch" weapon capability to provide deployable, mobile anti-tank firepower support for their scout vehicles. The U.S. has traditionally used tanks in this role, but with the M1's limited strategic mobility, the British concept has merit. Adding the Longbow Hellfire or the LOSAT missile to the TRACER/FSCS could meet this requirement. The U.S. is committed to a HMMWV IO-SAT, but might also consider this "overwatch" FSCS design.

Aside from added weight and complexity, another problem in meeting the cavalry's weapon and armor requirements is the potential for "design creep," making the FSCS weapon suite similar to the system needed on the Future Infantry Vehicle (FIV). This could lead to the same "mission creep" problem that battalion scouts had with the CFV's firepower in the '80s, when scouts tended to become decisively engaged instead of avoiding enemy contact. The decision of

how large a gun to place on the FSCS — big enough to defend itself, but not encourage engagements — will be a challenging decision.

Wheels or Tracks?

Is it even possible for a wheeled vehicle to meet the demands of an FSCS? Certainly, there are many four- and six-wheeled reconnaissance vehicles produced around the world that have performed marvelously. Clearly, wheeled vehicles are faster, weigh less, have better fuel economy, are quieter, and are easier to maintain. But tracks provide better ballistic protection and a smaller silhouette than wheeled vehicles. Tracked vehicles require higher maintenance and fuel during continuous operations, but wheeled vehicles have the disadvantage of limited mobility in restrictive terrain. The FSCS has to be smaller than the 8x8 LAV and have better protection than the Bradley M3.

Obviously, a wheeled FSCS could not travel everywhere tanks could go, but would it need to? Unrestricted mobility is less of a concern during defensive, reconnaissance, and security operations due to the ability and time (ideally) to pick appropriate routes. For offensive operations, today's mechanized forces attack on major avenues of approach while scouts traditionally travel on high-speed secondary routes or through forested (concealed) areas. Wheeled scouts can't travel in narrow, muddy gaps that have been churned up by tracks. But, if the Army's future involves fewer conventional missions and more operations other than war, is it essential to have a tracked FSCS?

For practical reasons, the FSCS may need to be tracked because as vehicle weight exceeds 20 tons, wheels become increasingly less effective, and a 20+ ton vehicle may be needed to allow space for the FSCS's future growth. Another wheeled vehicle disadvantage is that its large tires, needed for optimum trafficability, would make a wheeled FSCS much higher, limiting air deployability, would provide less internal volume for components, and would be difficult to armor effectively. Wheeled vehicle trade-offs, like raising the vehicle silhouette, must be balanced against its noise reduction, range, and maintenance advantages in prolonged operations.

It's easier to make a wheeled vehicle swim, which would give scouts the huge advantage of not being limited to bridges during river crossings. With the latest technology in tires and drive systems, are we limiting ourselves before we consider a wheel option?

Common Platform Approaches

Designing future systems to operate from a single vehicle chassis greatly reduces logistical costs and infrastructure. The "family of vehicles" (FOV) concept is very popular overseas, with the Swiss providing an extreme example of having an entire mechanized force (tanks, infantry, scouts, mortars, artillery, maintenance, and engineers) all built on one chassis.

Having one chassis design for a wide variety of vehicles provides a major logistical advantage, but there are also limitations. The FSCS is touted as the advanced technology demonstrator for the FIV and Future Combat System (FCS). Both programs may try to put their components on the FSCS as a test bed for their own needs. As a result, the

Wheeled scouts can't travel in narrow, muddy gaps that have been churned up by tracks. But, if the Army's future involves fewer conventional missions and more operations other than war, is it essential to have a tracked FSCS?

their own needs. As a result, the FSCS can lose its identity as a low-silhouette, stealthy vehicle. A family-of-vehicles approach would require any tracked FSCS to have a chassis compatible with personnel requirements for the Future Infantry Vehicle, the follow-on to the M2. Both the FIV and the Future Combat System programs will require a lethal offensive weapon suite for their missions, a requirement that might "creep" onto the FSCS design, adding firepower that would not be essential for the scouts' primary missions.

It is accepted today that any future light armored force must be built around a FOV concept, to reduce cost while increasing the supportability of a variety of vehicles. But does the FSCS have to become a part of the family, or is the scouting community better served with a unique vehicle (wheeled or tracked)? By 2025, the U.S. should have a common heavy and light chassis for tanks, artillery, infantry, engineer, air defense, and maintenance vehicles. It may be a political/financial reality that a FSCS will be designated to set the light chassis FOV standard, serving as the "bridge" for the FIV/FCS programs. This raises a historical concern: that, since WWII, as previous scout/cavalry designs became closer to infantry or tanks, the programs have been cancelled. The joint venture with the U.K. may alleviate some of these con-



Blind Alleys

The ill-fated Armored Reconnaissance Scout Vehicle program of the 1970s actually produced two prototypes, one wheeled and one tracked, including the ingenious Lockheed wheeled vehicle, at right, that was hinged to perform reconnaissance in rough terrain. Three of these were built and extensively tested. At left is the tracked entry, seen here in model form.

cerns, but the Army will be challenged to keep the push for a FOV from redefining or confusing the capabilities needed on a scout vehicle.

FSCS Manning – Death Before Dismount?

There is a growing trend spawned through DOD downsizing to do more with less and let technology fill the gap, but a scout vehicle manned by only two or three soldiers would not allow scouts to conduct their traditional dismounted operations. Mounted operations are important, but one of the most lethal forces on the battlefield is the trained dismounted scout, in position, with a radio.

A fourth man should be considered so FSCS sections can conduct three- to six-man patrols, a limited capability of the current 10-HMMWV scout section which may have only six FSCS vehicles. A fourth man is also necessary for continuous surveillance and maintenance operations in a turreted and tracked FSCS vehicle. While there have been promises of reduced maintenance duties on the FSCS through “highly advanced technologies and extended reliability,”⁸ the debate becomes moot when the first enemy shell falls.

FM 100-55, Reconnaissance Operations, states that “Equipment factors can drive the choice of reconnaissance techniques, however, they should not dictate that choice.” It would be criminal to provide scout/cavalry units a new vehicle, but eliminate their ability to choose between mounted and dismounted operations because of inadequate manning. In designing the FSCS, we must remember that scout and cavalry units must be provided with not only the equipment, but also the personnel necessary to accomplish the missions of the future.

The FSCS’s Competition — Aerial Reconnaissance

With recent technological advances in all-seeing long range battlefield sensors mounted in UAVs, helicopters, or large platforms such as Joint Surveillance Attack Radar System (JSTARS), the issue of why we need to fund a new reconnaissance program is legitimate. To win the future information war on a limited budget, the Army must decide how much to resource the competing technology demands of aerial versus ground reconnaissance systems.

Scout helicopters offer the advantage of rapid exploration of large areas, using thermal and other sensors to detect and acquire targets. UAVs offer the additional flexibility to fly deep into enemy territory to obtain timely intelligence without risking human life. However enemy ADA, weather, aviation logistical support, and the ability to locate camouflaged smaller forces limit both systems. Additionally, the responsiveness of helicopters, UAVs, and other intelligence assets to the brigade and below commander’s information requirements will always be a struggle with higher headquarters. The FSCS provides the ground commander direct access to an intelligence gathering system essential for decision-making on the battlefield.

MG Roy Beauchamp, Commanding General of Tank-automotive and Armaments Command (TACOM), made the case for ground reconnaissance. He stated in April 1998 that, “a ground scout is still necessary for mounting continuous operations because: it can operate in all weather; is unaffected by air defenses; permits on-site judgment; allows physical retrieval of materials; and can complement airborne sensors by operating in

areas obscured from aerial observation by terrain, foliage, or camouflage.”⁹ The important factor is that the FSCS’ design must demonstrate unique capabilities to truly differentiate the system from the Army’s other information gathering platforms.

A Solution – Modularity

The competing scout/cavalry capabilities make it hard to create one design that fits all. There are light forces pushing for a wheeled FSCS focused on stealth, while some in the heavy (cavalry) force may still desire another “bite” from the cancelled AGS “apple.” Reality dictates that “we need a light armored vehicle that can operate on both ends of the spectrum of conflict — a vehicle that gives us greater (stealth) versatility while allowing us to deploy early and offer a credible (armored) deterrence.”¹⁰

A scalable, modular design is one solution that might meet the differing needs of the U.S. and British armies for ground reconnaissance. All vehicles would be equipped with a superior C4I and sensor suite to perform standard operations. The scout-like variant could have just the basic equipment and self-defense weapons, while cavalry vehicles would have a larger caliber gun placed on the same hull. Similarly the UK “overwatch” vehicles could have their base TRACER hull augmented with the latest in anti-tank missiles. The combination of modular scout and cavalry FSCS variants would allow the Army to efficiently conduct future ground reconnaissance in conventional and non-conventional settings.

For non-confrontational settings, the U.S. could maintain the current XM1114 scout HMMWV or upgrade it to be similar to MOWAG’s 5-ton armored “Eagle”

version of the HMMWV that is currently used by the Swiss and Danish militaries. This action would maintain the Army's ability to conduct humanitarian operations with the appropriate protection for ground reconnaissance forces.

FSCS Program Survival

The Armor community must make clear its role in the new global environment. The cold war Abrams and Bradley systems will be here for another 20 years, but the FSCS will be Armor's first entry into the new generation of combat systems. Concerns surround the program, and in January 1999, skeptics in the Office of the Secretary of Defense (OSD) called for a review of the FSCS, suggesting that the vehicle may cost too much and not meet the service's requirements.¹¹

Cost is always a factor in designing weapon systems; the M1A2 costs over \$6 million, the current Bradley M3A3 costs \$3.6 million and the M1114 scout HMMWV costs \$150,000. The proposed FSCS is budgeted to unit cost between \$3-\$5 million, but many believe an appropriate system cost should be under \$2 million. OSD's concern is that the Army's FSCS proposal "specifies development of what will essentially be a medium tank, similar to the defunct AGS, as the armor community's 'bridge to the future'."¹² Some in DOD have labeled the currently envisioned FSCS a potentially "unaffordable and inappropriate concept."¹³ A well-designed system, however, would spawn large international sales, effectively lowering unit cost for the U.S. and U.K.

Armor branch and the FSCS program office will continue to fight for the vehicle, but there must be care taken as to what components are mandated in the design and at what cost. In the current budgetary environment, it's not healthy to create a vehicle with the latest technology in all areas at a prohibitive cost.

Also, the mechanized community must exercise restraint and not increase the cost of the FSCS by loading it with technology that might eventually fit into their Future Infantry Vehicle and Future Combat System, but is not critical for scout and cavalry missions.

If the Armor community doesn't make the procurement of the FSCS a priority, the program will follow the tradition of the Armored Reconnaissance Scout Vehicle and Armored Gun System programs. The Infantry fought for the M2 Bradley, even though its initial performance was less than stellar. A FSCS program failure would result in the cavalry waiting on the FIV development while

the scouts languish in the HMMWV. If a crisis arose which found our reconnaissance assets inadequate against the threat, would the U.S. be forced to consider the immediate purchase of a foreign scout vehicle to fill the capabilities gap, as we did with the German-built Fox chemical surveillance vehicle?

All of these concerns may be alleviated if the multinational defense industry teams and the FSCS U.S./U.K. Joint Program Office can work together on creating several vehicle concepts with necessary capabilities at a reasonable cost. Currently, the two industry teams are refining the vehicle requirements and concepts and plan to deliver competitive designs in October 1999. These designs must be robust enough to provide stealth, C4I, and protection for the FSCS while differentiating the vehicle from FIV/FCS concepts. A cooperative acquisition environment will fuel the creation of the most technologically advanced armored vehicle of the modern era.

Conclusion

The public will not tolerate the price tag for every program the Pentagon feels it needs for national security, to include; fighting two simultaneous wars, weapons development, peacekeeping and humanitarian assistance. If a cyber-terrorist, a nuclear device, or a peacekeeping operation is our most likely future threat, why do we need a modern mech force? Will DOD resource armored vehicle technology development as a priority, or will mechanized programs lose the budget fight to the Air Force, Navy, and other Army programs?

How necessary are mechanized forces in the modern era? At this moment, deterrence is being maintained in the Middle East with air and naval force. Mech forces have not been "invited" to the conflict in Kosovo. Armor is used in Bosnia and mechanized ground forces provide the military its "big stick," but at what size and strength in the future? As Armor officers, we are witnessing a reduction in force structure within our branch (from four tank companies to three in battalions). Today, where's the credible enemy mechanized threat that we can use to justify development of the Army's FSCS/FIV/FCS programs?

With the evolving Army XXI, the cutting edge of our mounted forces cannot be allowed to become "dull." The FSCS is one of the paramount systems needed to support the Army's Vision 2010 mission to "Gain information dominance." A well-designed FSCS will provide tactical and operational commanders with a ground asset that can be re-tasked on a moment's notice, that is compatible with

all operations and environments and capable, through stealth, of achieving information superiority for follow-on forces. These FSCS operations will demonstrate the need for mechanized forces in the dynamic and unpredictable global environment. If the DOD does not support the FSCS, the Army will not have a modern, (C-130) deployable light-armored vehicle for at least 15 years. With the increased need for rapid deployment to meet tomorrow's threats, can the mounted force be left behind while other branches and services are left to fight and win the next war?

Notes

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The Case for an Airmobile, Amphibious Scout Vehicle

by Stanley C. Crist

In the the January-February 1999 *ARMOR*, Dr. Asher H. Sharoni and Lawrence D. Bacon described a conceptual Future Scout and Cavalry System (FSCS) that is a masterpiece of advanced technology. Except for the fact that the commander and gunner are located in the hull, the Sharoni/Bacon FSCS has a basically conventional configuration that is approximately as long and wide as an M2A2 Bradley, and weighs 15-20 tons. To enable the scout vehicle to move rapidly about the battlefield, a hydro-pneumatic suspension and a hybrid power system would allow cross-country speeds in excess of 60 miles per hour!

Designing a better suspension and increasing the power-to-weight ratio is the usual method for improving mobility. This approach is somewhat lacking, however, as the increased speed capability would soon be matched by other armored vehicles. What is needed is a way to achieve a mobility differential that won't be negated by improved suspensions, whether on our own tanks or our enemy's. Like the horse cavalry in relation to the foot soldier, the FSCS should be capable of a speed differential on the order of *four to one* — or even greater! It was just such a mobility differential that enabled Brigadier General John Buford's 1st Cavalry Division to take possession of the high ground at Gettysburg before the slower Confederate infantry could.

The trouble is, there is a practical upper limit to how fast a tracked vehicle can be driven off road, and — except for flat, desert areas like those of Southwest Asia — that limit is far below 60 miles per hour. In forests, mountains, jungles, and urban terrain, the maximum speed attainable by a ground-hugging FSCS may be no faster than that of a horse.

It should be obvious that the only way the FSCS can have a four-to-one speed differential is if it can fly. This is not to advocate the substitution of helicopters for the FSCS, even though they have been successfully employed for scouting for many years. However, the helicopter's superior mobility would prove in-

valuable to an FSCS. If the scout vehicle were of a size and weight that permitted it to be transported in the cargo bay of a standard CH-47D, it would be able to move around the battlefield at speeds greater than *140 miles per hour!*

Helicopter transport of scout vehicles is not a new concept. Scout HMMWVs and Marine Corps LAV-25s are often carried by helicopters as underslung loads, but rigging (and derigging) a vehicle for sling carry takes time, and exposes the personnel, rotorcraft, and vehicle to a number of hazards. These dangers could be minimized if the scout vehicle were to be capable of *internal* transport by a cargo helicopter. Unfortunately, the HMMWV is a little too wide to fit into a CH-47, while the other scout vehicle currently in use — the M3 Bradley — is much too big and heavy even for sling carry.

One full-tracked, armored vehicle that can be transported in the Chinook's cargo bay is the Wiesel weapon carrier. In 1994, the German army formed an airmobile, light armor battalion that is equipped with TOW and 20mm autocannon variants of the Wiesel. This unit is primarily employed for overwatch missions, counterattacks, and blocking actions, but it can also be used to perform reconnaissance. The Wiesel is likely very well suited to those roles, but it lacks the internal space needed to hold four scouts and their equipment. The manufacturer has developed a longer and taller version, however, that might prove usable in the scout role. Unfortunately, the increased height of the "stretched" variant dictates that its weapon would have to be removed in order for the vehicle to fit in a CH-47.

Also, none of the Wiesels are capable of swimming, which definitely limits their potential as a scout vehicle. One of the FSCS requirements is for a *mobility differential* relative to both the supported force and enemy units. Accomplishing this demands not only high speed, but also the ability to swim *without preparation*. This characteristic was not incorporated into the Sharoni/Bacon FSCS con-



cept, and at a combat weight of 40,000 pounds, it seems unlikely that a vehicle of the proposed configuration could swim without the aid of a flotation screen — a device that is time-consuming to erect, exposes the crew to possible enemy fire during the assembly procedure, and is too vulnerable to damage during combat operations.

In the brief history of mechanized warfare, the combat use of flotation screens by tanks and infantry vehicles has been relatively rare, and has too often resulted in sunken vehicles and drowned crewmen. Because of these factors, the world's armies continue to depend on bridges, ferries, and fords to enable their armored forces to cross water obstacles. A scout vehicle that could — without preparation — swim across bodies of water would have a distinct advantage over an opposing force that lacked that capability. It could, for instance, use a water obstacle as an aid in breaking contact with a non-swimming opponent. Also, the scout vehicle commander would be able to choose almost any point on a river at which to cross, instead of being forced to cross at locations that are sure to be in the enemy's gun sights.



There is only one tracked, armored vehicle available that has extremely good mobility on all types of terrain, can swim well without preparation, has ample room for a crew of four and a full complement of surveillance equipment, and yet is small enough that it can fit inside of a CH-47. That is the Swedish Bv206S, a variant of the M973 SUSV currently in service with some units of the U.S. Army.

In its present form, the Bv206S could undoubtedly be an excellent scout vehicle, having mobility far superior to both the HMMWV and the M3A2. It is not perfect, though. The armor protection is only comparable to that of the M1114 HMMWV (7.62mm AP and 155mm HE airburst), well below what would be desired. As with the HMMWV, crew vision is provided by windows; such large, flat, glass surfaces tend to be highly reflective, and can produce a visual signature that can be easily seen at long distances.

The Bv206S, like the M973 SUSV, is an articulated vehicle; in essence, it is two tracked vehicles that are mechanically connected. It seems that articulation is necessary for a vehicle that is narrow

enough to fit into a CH-47, yet has the requisite mobility and agility. A vehicle with a width of 6.5 feet can be no more than about 13 feet in length, due to technical limitations of tracked vehicles design. A conventional vehicle of these

“In its present form, the Bv206S could undoubtedly be an excellent scout vehicle, having mobility far superior to both the HMMWV and the M3A2. It is not perfect, though....”

dimensions would be subject to violent pitching when crossing rough terrain at high speed, making it impossible to keep pace with fast-moving tanks and infantry carriers.

Articulation effectively solves the mobility problem inherent to a narrow vehicle, but it causes complications in providing for armament and crew positioning. The Bv206S has a weapon configuration

identical to that of the scout HMMWV: a machine gun mounted on the roof of the front vehicle. Not only are these weapons less capable than most scouts would prefer, but it appears that the weapon must be dismounted from the Bv206S in order for the vehicle to have enough vertical clearance when entering or leaving the CH-47. This means that the scouts would be unable to defend against attack while waiting to board the helicopter, and just after offloading.

It does not seem possible to fix these deficiencies without a complete redesign of the vehicle, in order to incorporate a more potent, turret-mounted weapon system. There are three options: install the turret on the front vehicle, the rear vehicle, or both. None of these choices is entirely satisfactory. Putting a two-man turret on the lead vehicle would make it difficult to create room for the driver, and the field of fire over the rear arc would be obstructed at times by the trailing vehicle. Placing the turret on the rear vehicle would greatly reduce the space available for surveillance equipment, and the field of fire over the front arc would be obstructed at times even by a low-profile front vehicle.

The third alternative is to put a small, one-man turret on both vehicles, so that targets can be engaged at all times, no matter how the front and rear vehicles are oriented.

Self-defense capability of the Bv206S could be substantially upgraded by utilizing the Javelin missile system. Preferably, the Javelin would be on a vehicle mount (similar to what M113 armored personnel carriers in Germany used to have for the Dragon antitank missile), but it could also be fired in hand-held mode by a soldier standing in an open roof hatch.

Due to the above-mentioned characteristics, it is rather unlikely that either the Wiesel or the Bv206S will be FSCS candidates. They do, however, have many desirable and outstanding features that should definitely be incorporated into a state-of-the-art scout vehicle. Whatever configuration is eventually selected for the Future Scout and Cavalry System, for maximum mobility it must be able to swim and to fly!



The German Army uses Wiesel armored weapon carriers, which are helicopter-deployable, as the core of a light armored battalion. They can be armed with 20mm autocannons or TOW missile launchers. The limited internal space, however, rules them out as carriers of a four-man scout team with its equipment, and Wiesels are not amphibious. – MAK Photo

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Scout Vehicle Specifications

General	M1114	Wiesel 2	Bv206S	M3A2
Length, overall (inches)	190.5	148.8	270.0	258.0
Width, overall (inches)	86.0	71.7	78.8	129.0
Height, overall (inches)	74.0	87.7	74.8	117.0
Ground clearance (inches)	15.3	11.9	13.8	18.0
Weight, combat loaded (lbs)	12,100	7,900	15,400	60,000
Performance				
Speed (on pavement)	70 mph	45 mph	31 mph	38 mph
Speed (in water)	----	----	2.9 mph	4.0 mph
Cruising range	275 miles	370 miles	230 miles	250 miles
Grade	60 %	60 %	100 %	60 %
Side slope	40 %	30 %	57 %	40 %
Vertical wall climbing	N/A	16 inches	24 inches	36 inches
Trench crossing	Nil	59 inches	67 inches	100 inches
Internal transport by CH-47D?	No	Yes	Yes	No
Swim without preparation?	Non-swimmer	Non-swimmer	Yes	No

BOSNIA REPORT

Swedish Mechanics

Help U.S. Troops Maintain

SUSV All-terrain Vehicles



Photo by author

Keeping SUSVs Goin' When It's Snowin'

by Staff Sergeant Conrad College
372nd MPAD

With the frigid, unpredictable Balkan winter fast approaching, Task Force Eagle called on the Swedish Army to help train U.S. soldiers on an unfamiliar, yet useful, all-terrain vehicle.

The Army has about 30 Swedish-built small-unit support vehicles — or SUSVs — deployed throughout the task force, to be used to transport troops and equipment to remote locations.

The SUSV is a great winter vehicle; just ask any Swedish soldier. But U.S. soldiers who recently came to Bosnia didn't know how to work on them, leaving most out of service. To get the fleet up and running, a team of Swedish Army mechanics taught U.S. soldiers how to conduct routine maintenance and, probably most important, how to drive the vehicles.

"The reason we have SUSVs here is to serve the troops on the hilltops," said Captain Lance Eldred, the 1st Armored Division's maintenance readiness officer. "Snow and rough terrain will not stop this vehicle."

The SUSV is a two-part tracked vehicle that hinges in the middle, excels in moving across snow, drives easily down the highway, is as silent as a shadow, floats and swims like a duck. Its Army designation is the M-973A1 carrier, cargo, tracked, 1½-ton, or small-unit support vehicle. The Swedish Army, which employs 4,000 SUSVs, calls them "tracked wagons." The vehicle is used extensively by Swedish companies for off-road transportation in snow and ice. The telephone company in Sweden uses the

SUSV to get to telephone poles and towers in remote locations, according to Swedish Army Major Lennart Malmgren, chief maintenance officer at Camp Odin near Tuzla.

Malmgren and a group of his staff came to Eagle Base recently to train U.S. mechanics from several different units. Built by Hagglunds Vehicle AB in Sweden, the SUSV can carry four people in the front section and up to 12 troops in full combat gear, or a little more than 3,000 pounds of cargo, in the back section. Malmgren said the vehicle has a Mercedes-Benz six-cylinder, in-line diesel engine and a Mercedes Benz four-speed automatic transmission.

"Sweden is a small country. We can't afford to order many special engines and other components," he said. "So we often use off-the-shelf parts that are already being mass-produced. This engine is basically the same as in a Mercedes Benz 300 automobile."

The driver's controls are user-friendly. Sitting in the driver's seat, the steering wheel, dashboard, and console-mounted gear shifter are almost the same as in a car.

"It's very easy to drive. It feels about like driving a small car," Malmgren said. "We have an Army of conscripts, where military service is compulsory. So we designed this vehicle to be easy to drive. When a person starts military service and has a driver's license for a small car, we can teach him or her to operate everything on this vehicle and in all sorts of terrain in three weeks."

The SUSV makes an excellent military ski-rescue vehicle. "The tracks are so

broad that, when fully-loaded, it weighs less per unit of surface area than a skiing soldier," Malmgren said.

U.S. troops found working on the SUSV relatively easy.

"It's pretty good. It's simpler than you'd think," said Specialist Adam Petersen, a mechanic stationed at Eagle Base with the 88th Air Defense Artillery, 2nd Armored Cavalry Regiment. "But you can't get underneath it to work. The bottom is a solid sheet like a boat, so it's like working on an inboard engine on a boat — you have to do things like change the transmission fluid from inside the cab. Even then, you pump the fluid out, using a hand-pump."

He said the Mercedes-Benz engine is nearly trouble-free. "There are very few problems with the engine, but I hear they have a lot of trouble with the track."

From a distance, the track looks like a regular, metal track, but it is actually a one-piece, rubber track. If it gets torn completely across, it must be replaced. Several Swedish Army mechanics and maintenance officers from Camp Odin worked with the American mechanics for four days at Eagle Base, showing them, not only maintenance by the book, but, also, many tricks and tips they have learned over the years.

Editor's Note: The Swedish vehicle described here is similar to the Bv 206S, also made by Hagglunds, that is mentioned in the previous article that begins on page 30. The major difference is that the Bv206S is armored while the M973A1 SUSVs are not.

Dutch and Germans Agree to Build “Fennek” Light Reconnaissance Vehicle



The “Fennek” (Desert Fox) reconnaissance vehicle carries a three-member scouting team equipped with mast-mounted FLIR, TV camera and laser rangefinder, powerful radios, and storage for enough supplies to sustain a 5-day mission.

— Mildata photos



by Gerard van Oosbree

An unusual wheeled armored vehicle suitable for scouting, security missions, and liaison is being developed in Europe for the German and Dutch armed forces. Two European firms, Wegmann and SP Aerospace, produced test models and are now refining the design based on the tests.

The Fennek is a fully armored, wheeled vehicle with a crew of three (driver, observer and commander). Both the Dutch and German armies tested two prototypes apiece during 1998 and from that a fifth prototype is now being built with all the changes deemed necessary after the tests. The new vehicle will be 5cm wider and will have a different armor design. Testing is scheduled for 1999 with the first production vehicle to be delivered in December 2001.

The Fennek is a little bigger than a HMMWV at 5.71 meters length, 2.49 meters wide, and with a height of 1.79 meters, it is about an inch lower. Because it is an armored vehicle, it weighs a hefty 10 tons. Its armor-clad aluminum monocoque hull protects against 7.62mm armor-piercing rounds, artillery fragments, and anti-personnel mines. But it can still outrun the HMMWV on paved roads with a top speed of 115 kph/71 mph. Big, run-flat, off-road tires are fitted, with a central tire inflation system (CTIS) to guarantee mobility in the field. The Fennek can negotiate a 60 percent forward

slope and a 35 percent side slope and can ford to a depth of one meter.

The Fennek has enough space to carry supplies to sustain its crew for five days in the field.

Stealth has been built into the vehicle as well. The hull was shaped to reduce radar reflection, and to reduce the exhaust heat signature, the exhausts are placed low in the rear of the Fennek and the hot exhaust fumes are ducted to cool them.

The large armored windshields can be covered by a special mesh that reduces glinting reflections when the vehicle is stationary, but doesn't interfere with the crew's ability to look out.

The driver, who sits well up front in the middle of the vehicle, has an unobstructed view of more than 180 degrees. A rearward-facing video camera with a monitor in the dashboard helps the driver reverse the vehicle without ground guidance from the other two crewmen.

The observer and commander both sit in the middle of the vehicle, with room between them for equipment. Both have revolving turrets. The commander's can be armed with anything from a machinegun to a 40mm grenade launcher. This weapon station is also equipped with smoke grenade launchers and can be remotely operated from within the Fennek.

The controls for the mast-mounted observation equipment, and also the navigation unit in German vehicles, is mounted on a rail that runs along the roof in front of the seats. This way, either crewman

can operate them by simply sliding it in front of him and locking the mount.

Using a mast mount for the observation equipment allows the vehicle to stay hidden while still retaining the ability to observe a target. The present design for the Dutch and German armies allows for the masthead to be tripod-mounted so it can be used away from the vehicle. This masthead carries a CCD camera, laser rangefinder, and thermal imager.

The Fennek is optimized for stealthy reconnaissance, unlike the Future Scout and Cavalry System, which has to be capable of both stealth and the ability to fight for information. The Fennek is not large enough to carry dismounts. It is more in the nature of a scout car, similar to the Swiss MOWAG Eagle (an armored version of the HMMWV), the French VBL, and the British Scarab.

The Dutch Army will acquire 218 Fenneks and the German Army 164.

Gerard van Oosbree is a Dutch photographer and writer specializing in military matters. He works freelance (Mildata Defence Images) as well as being European Correspondent for the *Journal of Military Ordnance* published by Darlington Productions in the USA. You can see his work at www.gironet.nl/home/mildata. His Email address is mildata@gironet.nl.

GROWING PAINS:

Scout-COLT Integration In the Brigade Reconnaissance Troop

by First Lieutenant Thomas P. Brennan, Jr.

When the 1st "Raider" Brigade of the 4th Infantry Division (Mechanized) deployed to the National Training Center in March of 1997 for the Advanced War-fighting Experiment, the rotation marked the first time ever that a visiting BCT possessed dedicated all-weather reconnaissance assets at the brigade level. Unmanned aerial vehicles and J-STARS notwithstanding, those assets came in the form of a brigade reconnaissance troop (BRT), consisting primarily of two scout platoons equipped with nine M1026 scout HMMWVs each. The troop also possessed two very special platforms, the 60-power, second-generation FLIR sight known as the Long Range Advanced Scout Surveillance System (LRAS3), and the periscope-like Hunter Sensor Surrogate Suite (HS3).

Fast forward now to March of 1999, when the Raider Brigade again found itself at the NTC, but this time with a much different looking reconnaissance troop.

Changes to the MTO&E had cut the scout platoons of the 1st BRT from nine trucks to six trucks, and the HS3 went back to Army Research and Development for further modification. Even more surprising, however, a Combat Observation Lasing Team (COLT) platoon had been added to the troop from 4-42 FA, the brigade's DS artillery battalion. The COLT platoon added 20 personnel, broken down into six teams and a headquarters element, along with six M1026 and one M998 HMMWVs. The new initiative married up the COLTs, whose mission it is to execute deep fires for the brigade commander, with the scouts of the 1st BRT, whose mission it is to provide "deep eyes" for the brigade commander. The new look BRT took the fight to the OPFOR at the NTC during rotation 99-05. Such an organization had never been tried before, so there were growing pains, but when the dust settled and the smoke cleared, the men of the 1st BRT had hammered out some effective TTPs,

drawing from the numerous lessons learned on the sand and rocks of the Mojave.

The troop's obvious first hurdle was integrating 13Fs and 19Ds under the same guidon. The troop felt that the communications plan would be the most difficult aspect of integration, due in large part to the standard COLT procedure of operating on a direct line to the brigade fire support officer. There was a communications void between the COLT observation posts and the troop CO/TOC (actually two separate vehicles in two separate locations that provide redundant communications), which resulted in a less than perfect picture painted for the brigade commander.

"COLTs have a very specific mission in the execution of deep fires, but as part of a reconnaissance troop they must also understand the important edge they can provide in the fight for information dominance."

The second hurdle was deciding how to employ the newly integrated scouts and COLTs. Through trial and error during force-on-force, three distinct methods evolved. Hand in hand with the process of how to put the people on the ground is the importance of where you put them. The new design required more detailed planning for the reconnaissance and security fight, especially in regards to synchronization of fires. Another planning consideration that proved to be a shortcoming during 99-05, was the plan for battle-handoff between the BRT and the lead task force scout platoon. The BRT did an outstanding job of painting the deep picture for the brigade commander, but the picture became murkier during

the transition to the close fight due to the lack of a coherent battle handoff plan.

The troop's number one concern during preparations for the March 1999 rotation was communications. During the brigade's October 1998 visit for the Leader Training Program, Brigadier General Dean Cash, then the NTC's CG, stressed that without communications, "you're just camping out." With this in mind, the 1st BRT felt the paramount task for the rotation was going to be the ability to talk to each other and to higher in the rugged terrain of the Mojave.

The real problem emerged with the internal flow of information between the COLTs and the troop CO/TOC. The flow did not come via the troop command net; the individual COLTs continued to operate almost exclusively on the brigade fire support net. The BRT counteracted the problem by co-locating the COLT headquarters vehicle with the troop CO, so the COLT platoon leader could easily update the troop commander face-to-face. The necessary measures for successful integration require that, just as scout SPOTREPs can generate a fire mission, COLT fire missions must generate SPOTREPs. The onus falls on either the COLT platoon leader or platoon sergeant to track fire missions from their individual teams, just as the scout platoon leaders track SPOTREPs, and push that information as a SPOTREP over the troop command net. Successfully accomplishing this integration refines the picture for the brigade commander.

Just as artillery shapes the battlespace by attriting, diverting, and harassing the enemy, so too can timely and accurate information. However, if that information remains on the fire support net, the brigade commander cannot leverage his assets in the most advantageous manner to shape the battlefield. The best way to overcome this is for the COLT HQ element to generate SPOTREPs from fire missions and push those SPOTREPs to the troop CO/TOC. COLTs have a very

specific mission in the execution of deep fires, but as part of a reconnaissance troop they must also understand the important edge they can provide in the fight for information dominance.

Prior to the marriage of COLTs and scouts in the 1st BRT, the responsibility of employing the COLTs fell on the brigade fire support officer. Now, since the COLT became part of the BRT, the troop commander determines the employment, based on the fires plan, with the added consideration of integrating his COLTs with his scouts. We developed three methods: scout/COLT joint OPs, scout (trigger)/COLT (observer) OPs in depth, and phased entry. The most important consideration to keep in mind when evaluating these methods is that they do not follow current doctrine. They are an attempt at establishing the foundation for new doctrine yet to be written. Obviously, with the application of these methods, there was initially some inflexibility for both scouts and COLTs. However, the soldiers of the troop overcame these feelings and placed their focus on accomplishing the mission. Throughout the force-on-force portion of the rotation, the merits and shortcomings of how to employ scouts and COLTs in the context of a reconnaissance troop came to light.

Several positive aspects are readily apparent when considering a scout/COLT joint OP. First and foremost is that the information flow problem disappears with co-location. SPOTREPs and fire missions flow from the same point. Also, with more personnel in an OP, more security is available. A third plus when considering the joint OP is the presence of superior optical capability in the form of the COLT-owned 13-power GVLLD (Ground Vehicle Lightweight Laser Designator) or the equally capable but eye-safe HGSS (Hellfire Ground Support System). The increased acquisition range when working in tandem greatly enhanced the scouts' ability to define the battlefield for the brigade commander. During 99-05, the joint OPs of the BRT positively identified enemy vehicles at ranges approaching 10,000 meters. The negative aspects of a joint scout/COLT OP include the fact that the higher number of personnel increases the signature of the OP, making it more likely to be compromised, and once compromised, both assets can be lost at the same time.

More often than not, the OPs were inserted mounted in vehicles. Current artillery branch doctrine considers a mounted insertion for COLTs as a last resort — preferring aerial insertion — and the con-

cept of a mounted OP is completely alien. However, one of the most important lessons learned during 99-05 was the effectiveness of running a mounted OP, especially when operating jointly. The benefits include the additional security of the vehicle-mounted weapon system, as well as mobility if the position becomes compromised. Just as important, by running mounted, the OP does not depend on batteries for operation of the GVLLD/HGSS and TAS-4B, running them instead from vehicle power.

Overall, vehicle placement is the key to running a mounted OP and surviving. The more difficult it is to get into position, the better the OP. The great thing about the openness of the NTC is that the terrain makes it possible to go high to see deep. However, with the presence of enemy rotary wing, scouts and COLTs should more often than not set up short of the highest point where they are looking to emplace the OP. The 1st BRT ran a number of mounted OPs during 99-05 and enjoyed tremendous success doing so. The events of the rotation proved the viability of running mounted, especially in the joint scout/COLT concept.

The scout (trigger)/COLT (observer) OPs in depth, and phased entry were more of a reality on the dry-erase board than in actual practice at the NTC, but the lessons learned point to their feasible employment in the future. The scout (trigger)/COLT (observer) concept attempts to employ the best of both worlds as scouts initially identify the enemy and call in the trigger for fires, then the COLT OP in depth receives the handoff and observes and adjusts the rounds to complete the destruction. The obvious advantage to this method is that it provides depth through the battlespace of the reconnaissance troop, with the call for fire experts positioned accordingly to deliver the most damage. The disadvantages vary, depending on whether one or both OPs are dismounted. The strong points of a joint OP can become liabilities when the OPs become spaced over the battlefield with this method of employment. The most alluring aspect of this method, however, rests in the fact that all fire missions are done in conjunction with the scouts initiating and the COLTs finishing the job. The presence of this handoff ensures that there will be no gaps in the information flow back to higher headquarters.

The last of the three methods of scout/COLT employment finds its basis in the concept of reconnaissance pull. Considering that the brigade S-2's initial read

may not always be entirely accurate, the beauty of a phased entry becomes clear. This method allows for refinement of the initial plan in the best possible way; i.e., with eyes out forward confirming or denying the situational template, and thereby "pulling" the follow-on elements into position. Two types of phased entry are possible: the scouts insert first and then, based on their read, the troop commander determines where to place the COLTs, and vice versa. The scouts would almost always look to insert on the ground, whereas the COLTs would most likely look for an aerial insertion. Of course, as with all three of the methods of employment discussed so far, METT-T drives the decision-making process. Phased entry can also incorporate the previous two methods in that once the second group inserts, they can make their way into either a joint OP or go ahead and establish OPs in depth. The bottom-line is that with phased-entry, the troop commander completes his IPB with the employment of one asset, and then once complete, he can commit his second asset to the best possible location.

Now, with an understanding of these TTPs for the employment of scouts and COLTs under the new concept of the reconnaissance troop, the focus can shift to the additional planning considerations necessary due to this new task organization. The two largest considerations that brigade planners must take into account are the added attention necessary for fires synchronization during the R&S fight, and the need for a brigade-driven battle handoff line between the reconnaissance troop and the lead task force scout platoon. The focus on getting eyes deep for the brigade commander often means that the assets of the reconnaissance troop will on average find themselves infiltrating distances of 15 to 20 kilometers ahead of the FLOT, or up to 20 to 30 kilometers away from the guns. The implications for effectively supporting them with indirect fires become apparent when considering spatial relationships and maximum effective ranges of weapons systems. During 99-05, the men of the 1st BRT effectively penetrated the OPFOR deep, only to find out, once a call for fire went up, that they had outdistanced the guns. This unfortunate realization would then result in the target dispersing or moving out while the observers waited for the guns to move up. The idea of supporting scouts and COLTs with indirect fires sounds easy enough, but the distances involved for a reconnaissance troop make the job a little more

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The Battalion Scout Troop:

A Doctrinal and Organizational Answer to Battalion Tactical Reconnaissance

by Captain Bill Williams

As a community, Armor leaders have struggled with the question, "how to best provide effective task force reconnaissance." There have been numerous articles in *ARMOR* outlining expedient task organizations and different tactics, techniques, and procedures. The March-April 1999 *ARMOR* shows two excellent examples.

First, LTC Henry St. Pierre and 1LT Jamie Warder's article, "Team Recon: A New Approach to Armored TF Reconnaissance: One Unit Hardens the HMMWV Scout Platoon to Increase Its Survivability," offers a thought-provoking expedient to solve the survivability problem of the task force scout platoon. Within today's doctrine, this unit should be commended for its non-doctrinal approach to providing the tactical reconnaissance capability that is vital to the battalion commander.

LTC St-Pierre and 1LT Warder's answer to the problem was to create an *ad hoc* reconnaissance force, "Team Recon," commanded by the HHC commander, as the "Chief of Reconnaissance." It consisted of the scout platoon and a platoon of tanks, a couple of dismounted infantry squads, a mortar section, and a CSS slice. This force, argue the authors, provides a scout force that can maintain contact with the enemy and "effectively break contact and 'retain the freedom to maneuver'."

They present a current tactical reconnaissance problem concisely. The current scout platoon in a tank or mechanized infantry battalion does not have the combat power to maintain contact with the enemy **and** retain the freedom to maneuver.

The second problem is the scout platoon's "lack of survivability." This problem "often presents the task force commander with a dilemma, send the maxi-

mum reconnaissance forward and risk losing it early, or husband his forces and miss some important piece of information...."

In the same edition of *ARMOR*, 1LT Wayne Westgaard wrote "Will the Brigade Reconnaissance Troop Be Adequately Protected?" 1LT Westgaard wrote an interesting analysis comparing the XM1114 Up-Armored HMMWV and the M3 Cavalry Fighting Vehicle. His premise was that the new brigade reconnaissance troop needs a more robust and survivable vehicle. He argues that there is such a vehicle in the inventory today, the Cavalry Fighting Vehicle. This article begs the question that perhaps all of our mechanized scouts are inadequately protected.

These articles ask some poignant questions that deserve attention. Do our task force scouts have the organization and tools to both accomplish their mission **and** survive, or does our reconnaissance doctrine and organization need to change to address the task force tactical reconnaissance limitations? LTC St-Pierre and 1-33 Armor worked within the current system to correct tactical and organizational flaws, but perhaps it is time that we, as a community, realize that we must change the organization to "fix" these flaws. After all, our doctrine already contains the answer to tactical reconnaissance; it is a combined arms answer. It is a robust force that is capable of using stealth, but also capable of responding with superior firepower. That force exists and is called the armored cavalry troop. It is a force that is capable of sustained reconnaissance operations and has the necessary command and control structure. It is a combined arms force that lacks only dismounted infantry in any strength. I do not believe that each battalion in the U.S. Army needs to field a complete armored

cavalry troop, although that would make quite a capable force; rather, I suggest that a half troop, based on the model of LTC St-Pierre and 1LT Warder, become the battalion reconnaissance force. This is the force that provides a model for the battalion scout troop, my recommendation to provide the task force with capable tactical reconnaissance.

Historical Background

An excellent monograph written in 1988 explores the question of tactical reconnaissance in the heavy division. In "Who is Out There? Tactical Reconnaissance Formations For the Heavy Division," MAJ James Diehl explores the doctrinal differences in tactical reconnaissance before World War II and during the war. He looks at three major belligerents, the Germans, the Russians, and the Americans. His findings reflect similarities in tactical reconnaissance doctrinal debates that occur today. Specifically, does the reconnaissance force use stealth and observation to gain its intelligence or is it forced to fight for this tactical information? He notes that early German and American doctrine stressed the need for stealth, but as the war progressed, the lesson learned in combat was the necessity to form *ad hoc* combat formations to fight for tactical information. The Russians followed the pre-war doctrine of fighting for intelligence, throughout the war. He quotes one American captain from a reconnaissance squadron, who found that the combination of a scout platoon and a tank platoon was the most effective team for reconnaissance.

The Rand Studies

Two studies made by the Rand Corporation on tactical reconnaissance require further attention. In 1987, The Arroyo

Center of the Rand Corporation published a study, "Applying the National Training Experience: Tactical Reconnaissance." This study was a statistical survey of tactical reconnaissance in over 60 rotations at the NTC. Among other things, the study found that scouts often engaged the enemy and that half the scouts died as a result in a given battle. The scout platoons at that time were mostly M113/ITV- or M3 CFV-equipped. The Rand study suggested that training was a factor in the poor reconnaissance abilities of the scout platoon, but that a stealthier vehicle was also needed. It suggested the **addition** of a wheeled reconnaissance platform to provide this capability. The report summary specifically stated, "A small number, perhaps two, wheeled vehicles should be added to the scout platoon for the purpose of stealth and numbers." Despite this call for a small change in the platoon, the Army decided, in most of its mechanized battalions, to totally replace the M3 and M113/ITV scout vehicles with HMMWVs and increase the number of vehicles from six to ten.

The second study, a 1994 Rand Study initiated by LTG Funk, outlines a smaller study of the effects of the major changes to the scout platoon's organization. The study covered approximately ten rotations, seven with HMMWVs, and three the M3s. The study found that like the previous study, the scouts attempted to use stealth. However, the scouts using both types of vehicles lost about half their strength each mission. Another interesting observation was the percentage of scouts that attempted to avoid direct fire engagements. In this limited sample, the observer/controllers found that only 74% of HMMWV scouts attempted to avoid the enemy, compared to 86% of the M3 scouts.

One might conclude from these two studies that scouting is simply dangerous business. Despite the attempt made to train the scouts to be stealthy and providing them with limited means for engaging the enemy — at least in this small sample — they still end up in direct fire fights that lead to unacceptably high scout casualties. If the NTC is any example, the battalion commanders in our next real war will end up reconstituting an *ad hoc* reconnaissance force after the scouts are effectively destroyed in the first few fights. This makes me believe that perhaps we should consider creating these "ad hoc" forces before we enter this difficult combat, and perhaps we should even

adjust our doctrine and organization to reflect this change.

Future Capabilities

It is clear to me from previous *ARMOR* articles and my own research on the Future Scout Cavalry System (FSCS) that force developers are moving towards quite a capable sensor platform that will make great strides in stealth and observation capabilities. It is for this reason that I will use this vehicle in the structure and tactics of the new battalion scout troop. In fact, the combination of stealth and sensors with a tank force may prove to be the best tactic for such capable future systems.

I also make this proposal at a very opportune time in force structure change. The elimination of the fourth tank company from the new division structure creates an opportunity to provide currently available machines and trained soldiers to create this change to the force.

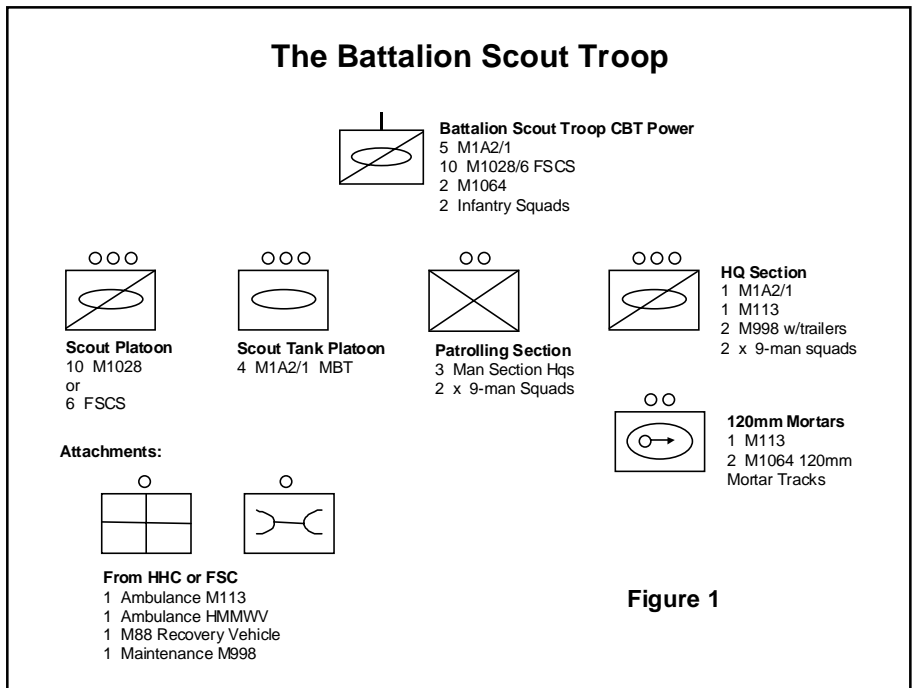
The Battalion Scout Troop

My proposal is to form the battalion scout troop. Such a troop would have three fighting platoons. See Figure 1. The scout platoon would be either the current scout platoon with 10 HMMWVs or a future force of six Future Scout Vehicles. Its role would be similar, if not identical, to the scout mission today. The troop

would have one tank platoon organic to the troop. This is a normal tank platoon with all the current tank platoon's capabilities and limitations. There would also be a dismounted infantry section, made up of 11B infantrymen or 19D scouts, that are used purely in the dismounted role; they could be carried in M113 tracked vehicles or two cargo trucks, but their primary training and mission would be dismounted patrolling. The troop would have a section of two 120mm mortar tracks and an FDC team carried by a M113 vehicle.

The troop commander would ride in a tank or M2 Bradley, depending on which parent battalion the troop originates. The troop would be commanded by a captain and would have a small troop HQ section, including a first sergeant. The troop XO could be a dual hat position, as tank platoon leader and troop executive officer.

The troop headquarters would have two M998 HMMWVs, one for the command group and one for supply. CSS is provided in a dedicated fashion with one attached ambulance M113, a 4-litter ambulance HMMWV, and an attached maintenance contact team with an M998 HMMWV and an M88 recovery vehicle. The wheeled ambulance is both for evacuation forward where stealth is needed and for long trips to the battalion AXP or aid station. This is an addition to



a current tank or mechanized company medical slice, but one that is badly needed for a dispersed force. The maintenance slice would be a small contact team capable of providing unit level maintenance and recovery to the tank platoon and to the scout vehicles. The medical M113 could be called upon to provide limited scout vehicle recovery, where self recovery is not possible and where the M88 would be unwieldy.

The beauty of this organizational change is that it could coincide with the planned elimination of the fourth tank company in tank battalions. The battalion scout troop could be composed of elements that currently make up the D Company in the battalions that are scheduled to be reorganized. The use of one or more of the three tank platoons scheduled to be eliminated and the use of the existing D Company headquarters structure, with appropriate CSS slice, is a natural transition. This organization could be easily stood up in existing battalions. The mechanized infantry scout troops could receive tanks from the disbanding D Companies in local brigades. The crews are, undoubtedly, already trained and cohesive units.

There is another professional benefit to this structural change. The creation of a scout troop creates another tank platoon and company-sized command for the armor force. The scout troop command might be an HHC-type command for the best tank or infantry company commander as a second command, as the forward support company concept strips the community of that second command opportunity. It also provides a difficult tank platoon job for the best lieutenants in the battalion.

Tactically, the battalion scout troop provides three main advantages. First, it provides a focused experienced unity of command for the battalion reconnaissance effort. Second, it provides a meaningful, survivable, and capable reconnaissance force that can use both stealth and reconnaissance in force to achieve the reconnaissance objectives. Lastly, it provides a sustainable force that can provide continuous reconnaissance of the task force sector.

Tactics

The scout troop can be used in much the same way as discussed in LTC St-Pierre and 1LT Warder's article, in fact, it can use doctrine and tactics that are similar to armored cavalry troop doctrine already in

use. As the FSV/FSCS is fielded, the capabilities of this future sensor and communication platform can be coupled with the killing power of the tank platoon in any number of configurations, perhaps with stand-off tank munitions and remotely piloted vehicles.

Hunter-killer actions, or massing the tank platoon when needed to assist the scout platoon, are two possible uses of this added firepower. Add to this a dismounted patrolling capability and an organic mortar section, and you get a credible combined arms force, which can provide the troop commander with the survivable means to seek observation and respond to fights in a more effective manner.

The scout troop will also provide the permanent counterreconnaissance force headquarters. This scout troop could be given the METL task of conducting all counterreconnaissance missions. The troop could be reinforced by tanks and mechanized infantry as METT-TC requires, but they would be consistently trained on this difficult skill.

Not only will the addition of tanks in the scouting role be beneficial to gaining tactical intelligence about the enemy, but it will also serve to deceive the enemy about the correct locations of the friendly front line trace or main force companies. The HMMWV never fooled any observer into believing it was a tank. If you see a hard shell HMMWV in our frontline area, you are probably not near the main body yet, but, if you see an M1A1 tank, who knows? Counterrecon missions already accomplish this to some degree in a defensive role, but not as much in offensive operations.

If this idea stretches to mechanized infantry battalions, it might provide additional deception to the purely organized mechanized infantry unit. The question in the enemy commander's mind may be, "Does this infantry battalion have tanks? Is it an infantry battalion or an tank battalion?" Confusion in the enemy commander's mind is good. It would be better to force that enemy commander to attack further into your defensive sector to find out.

Command and Control

The scout troop relies on the idea of combined arms and another time-tested principle of war — unity of command. The "Chief of Reconnaissance" is the troop commander and he is positioned at

the best place to command and control that element, where he can see the battlefield. Further, as a commander, he is directly responsible to the battalion/task force commander for all reconnaissance tasks and missions in the task force. The battalion staff provides planning and assistance to the troop commander, as required, but the task force commander gets experienced tactical judgment, in the form of his most experienced tactical commander, to focus on this important task. The battalion commander of the next ten or so years is also used to having four maneuver elements and will no doubt appreciate the increased reconnaissance capability.

CSS

One of the more difficult questions for current battalion commanders at the combat training centers is sustaining and caring for the battalion scouts. Many battalions have been successful at CSS at the training centers, but most have relied on their own initiative in supporting the scouts.

The focus of a dedicated scout ISG and XO with habitually attached CSS elements is the right answer to alleviate this problem. Many times the scout platoon is forced to move many kilometers behind enemy lines to get "eyes on" a particular Named Area of Interest (NAI). As the scouts make contact with the enemy, the wounded scouts are forced to wait while a medevac is pondered or they simply die of wounds. The scout troop commander will be more capable to use his own troops to rescue a wounded scout or extricate the scout vehicle or section in contact.

Further, the troop ISG will be more likely to be able to move his own dedicated medic to save the scout and evacuate him to an aid station. Maintenance recovery will also be a more focused exercise for the scout troop. Resupply from a dedicated ISG might also prove to be more efficient.

Odd supply times and multiple resupply missions in a day, given the continuous nature of the scout troop mission, would surely be simpler to accomplish with a dedicated troop ISG and supply sergeant.

Reorganization Options

There are two ways to tackle this reorganization, as I see it. One is to use tanks in all battalion scout troops, mechanized and armor battalions. This would be ac-

complished by distributing tank platoons from the lost D Companies to the mechanized battalions and standing up a troop headquarters within the mechanized battalions. The pain would be greater in those units, because they would have to create the troop headquarters and the troop CSS assets. But, the late Echo anti-tank company is not such a distant memory in the infantry community and they might want to give it a shot.

The second option is to just reorganize the scout troop in the Armor battalions. This might be more cost effective and it is better than having no change at all. The infantry community might find the means to develop this idea on similar terms within their organization.

A third option is to beef up only the Armor battalions and the new brigade reconnaissance troops with a section of mortars and a platoon of tanks. This might further address the survivability of this newly acquired asset.

Conclusion

Operations in Somalia and the Balkans only reinforce the idea that technology alone cannot replace the need to provide for tactical intelligence on the ground with robust forces. The vulnerability of HMMWV forces to sustained mechanized combat cannot be overstated. The time has come to recognize the frailties of the current scout platoon organization. Whether this force has HMMWVs, M3s, or FSCSs, the scout platoon is asked to provide tactical intelligence for a lethal and powerful force. This force is expected to face equally lethal and powerful adversaries. We should consider providing the task force commander with a force capable of meeting modern mechanized forces and either getting intelligence using stealth or fighting for it, and we should do this in our organizational structure and in our doctrine. We should use the current restructuring to accomplish this goal.

CPT Bill Williams, a 1988 Distinguished Military Graduate from Texas A&M University, served in Germany as a tank platoon leader, Headquarters Company XO, battalion maintenance officer, and S1 for 5th Battalion, 77th Armor. After attending the Armor and Artillery Officer Advanced Courses, he served as the S4, tank, and headquarters company commander of 3rd Battalion, 66th Armor, and commanded A/4th Forward Support Company during the Advanced Warfighting Experiment in March 1997 at the National Training Center. He is completing a Masters degree in Industrial Engineering in Simulations and Training Systems at the University of Central Florida in Orlando. On graduation, he will be assigned to The United States Military Academy to teach in the Department of Military Instruction.

Scout-COLT Integration Continued from Page 36

difficult, and nearly impossible if the planners do not account for those distances. The guns need to already be in place before that first fire mission comes across the net.

Aside from outdistancing the guns, another consideration is the need for a coherent battle handoff between the reconnaissance troop and the lead task force scout platoon. Throughout the rotation, the brigade commander always had a clear picture of how the enemy looked deep due to the presence of the BRT. However, the lead task force scout platoon often did not move up far enough or in sufficient time to receive the deep contacts as they moved forward for the close fight.

The resulting problem was that the brigade saw the enemy deep, only to lose them in the transition to the close fight. A solution to this problem needs to be that the brigade R&S order establishes a battle-handoff line for the lead task force scout platoon where they will receive the contacts from the reconnaissance troop. Of course, the line will be fairly static in the defense, whereas in the offense it will move.

The presence of a battle-handoff line necessitates that there is a lot of cross-talk between the lead task force scout platoon leader and the BRT CO/PLs. The ironic nature of what often happened at 99-05 was that the lead task force scout platoon and the lead task force TOC often eavesdropped on the reconnaissance troop command net, trying to glean the picture from the internal traffic of the troop. If the brigade order dictated a battle-handoff line, then that eavesdropping could just as easily become cross-talk, allowing for a coherent battle-handoff.

The OPFOR scouts are extremely proficient at this already, as is made apparent through the rock solid synchronization between their division and regimental reconnaissance. If BLUEFOR scouts hope to win the reconnaissance fight — which means almost guaranteed success for the close fight — they must become proficient in the battle-handoff process. The key to establishing that proficiency lies in a brigade R&S plan that forces a seamless transition from the deep to the close fight.

The decision to place the COLT platoon in the reconnaissance troop demonstrates

the division's dedication to increasing lethality, survivability, and the operational tempo of its brigade "deep fight" assets. As mentioned earlier, the events of NTC 99-05 stand as the first attempt at defining the foundation upon which the Army will write the new doctrine of the brigade reconnaissance troop. The incorporation of COLTs into the brigade reconnaissance troop is logical, and the benefits become readily apparent when considering the events that transpired in the California desert during March of 1999. The men of the 1st BRT have broken new ground, and in doing so they have served to provide a glimpse of the future. As the TTPs become refined, and both scouts and COLTs become more comfortable to the new surroundings, that future appears ever more capable and utterly lethal. RECON!

1LT Thomas P. Brennan, Jr. is the 1st platoon (scout) leader of G Troop, 10th Cavalry, 1st Brigade, 4ID (M). During the time following NTC, the 1st Brigade Reconnaissance Troop reflagged as G/10th Cav.

Organizing the First Armored Divisions

The Meeting at a Schoolhouse in Louisiana in 1940
 Dragged the Infantry and Cavalry Branches
 Into the Age of Combined Arms

by John B. Wilson

Editor's Note: Because the Cavalry branch of the Army took the lead in adopting mechanization in the 1930s, it is a common misconception that the Armor branch grew directly from Cavalry. This was not the case, as historian John B. Wilson describes it in a new volume of the Army Lineage Series, *Maneuver and Firepower: The Evolution of Divisions and Separate Brigades*. The following excerpt is used with permission of the Center for Military History.

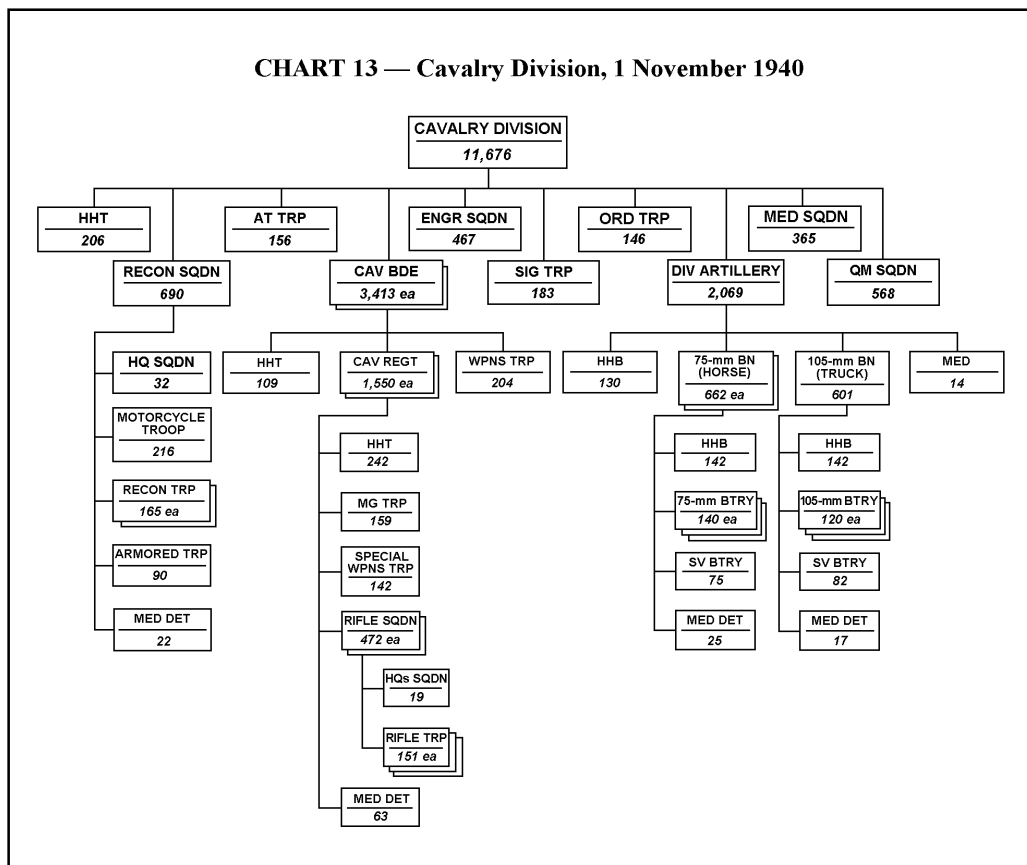
During the 1940 maneuvers the Army also had tested a provisional mechanized division. After the German invasion of Poland in 1939, Brig. Gen. Adna R. Chaffee had called for "armored" divisions separate from both infantry and cavalry. Chaffee's 7th Cavalry Brigade (Mechanized), Brig. Gen. Bruce Magruder's Provisional Tank Brigade (organized in 1940 with infantry tank units), and the 6th Infantry made up the new unit. At the conclusion of the exercises, Chaffee; Magruder; Col. Alvan C. Gillem, Magruder's executive officer; Col.

George S. Patton, commander of the 3d Cavalry at Fort Myer, Virginia; and other advocates of tank warfare met with the G-3, General Andrews, in a schoolhouse at Alexandria, Louisiana, to discuss the future of mechanization. All agreed that the Army needed to unify its efforts. The question was how. Both the chief of cavalry and the chief of infantry had attended the maneuvers, but they were excluded from the meeting because of their expected opposition to any change that might deprive their arms of personnel, equipment, or missions.¹

Returning to Washington, Andrews proposed that Marshall call a conference on mechanization. The crisis in Europe had by then increased congressional willingness to support a major rearmament effort, and at the same time the success of the German panzers highlighted the need for mechanization, however costly.

Andrews' initiative, made three days after the British evacuated Dunkirk, noted that the American Army had inadequate mechanized forces and that it needed to revise its policy of allowing both infantry and cavalry to develop such units separately. He suggested that the basic mechanized combined arms unit be a division of between 8,000 and 11,000 men. With the chief of cavalry planning to organize mechanized cavalry divisions, which mixed horse and tank units, such a conference seemed imperative. Marshall approved Andrews' proposal.²

CHART 13 — Cavalry Division, 1 November 1940



From 10 to 12 June 1940 Andrews hosted a meeting in Washington centering on the organization of mechanized divisions. Along with the General Staff and the chiefs of the arms and services, Chaffee, Magruder, and other tank enthusiasts attended. Andrews disclosed that the War Department would organize an independent armored force, belonging to neither the Infantry nor Cavalry branches, in the form of "mechanized divisions." In such divisions the command and control echelon would consist of a headquarters and headquarters company and a signal company. A reconnaissance battalion with an attached aviation observation squadron would constitute the commander's "eyes," which would operate from 100 to 150 miles in advance and reconnoiter a front from 30 to 50 miles. At the heart of the division was an armored brigade made up of a headquarters and headquarters company, one medium and two light armored regiments, a field artillery regiment, and an engineer battalion. Using the two light armored regiments as the basis for two combat teams, the division was to conduct reconnaissance, screening, and pursuit missions and exploit tactical situations. An armored infantry regiment, along with armored field artillery, quartermaster, and medical battalions and an ordnance company, supported the armored brigade. Similar to the German panzer division, it was to number 9,859 officers and enlisted men.³

When approving the establishment of the Armored Force to oversee the organi-



A column of light tanks from 68th Armor, part of the 2nd Armored Division, moves down a dusty road during the 1941 Louisiana Maneuvers. The 2nd AD was one of the first two U.S. armored divisions established by order of General Marshall the previous year.

zation and training of two mechanized divisions on 10 July 1940, Marshall also approved designating these units as "armored" divisions. Furthermore, he directed the chief of cavalry and the chief of infantry to make personnel who were experienced with tank and mechanized units available for assignment to the divisions. On 15 July, without approved tables of organization, Magruder organized the 1st Armored Division at Fort Knox from personnel and equipment of the 7th Cavalry Brigade and the 6th Infantry. Concurrently, Brig. Gen. Charles L. Scott, a former regimental commander in the 7th Cavalry Brigade, activated the 2d Armored Division at Fort Benning using men and materiel from the Provisional Tank Brigade. Marshall selected Chaffee to command the new Armored Force.⁴

Four months later the War Department published tables of organization for the armored division. It resembled the unit developed during the summer, except that the engineer battalion was removed from the armored brigade and assigned to the division headquarters, and the ordnance company was expanded to a battalion. To the surprise of Chaffee, who had supervised the preparation of the tables, the authorized strength of the division rose from 9,859 to 12,697, including attached personnel.

The division fielded 381 tanks and 97 scout cars when all units were at war strength.⁵ Chaffee envisaged the establishment of corps-size units commanding both armored and motorized divisions, the latter essentially an infantry division with sufficient motor equipment to move all its personnel. On 15 July 1940 the War Department selected the 4th Division, which had recently been reactivated as part of the Regular Army's expansion, for this role. Collocated with the 2d Armored Division at Fort Benning, the 4th's divisional elements had earlier experimented with motorized infantry. Eventually the department published tables of organization for a motorized division that retained the triangular structure but fielded 2,700 motor vehicles including over 600 armored half-track personnel carriers.⁶



The 1st Armored Division's 150 tanks are lined up prior to maneuvers in June, 1941, less than six months before the U.S. entered World War II. At the outset of the war, the U.S. had only 400 tanks, most of them, like these, already obsolete.



General George C. Marshall, impatient with the Infantry and Cavalry branch chiefs' progress in adopting mechanization, finally decided to form the first two armored divisions over their objections.

Along with the reorganization and expansion of divisional forces, the Army increased unit manning levels and concentrated units for training. A peacetime draft, adopted on 16 September 1940, provided the men, and eventually the strength of all divisions neared war level. Prior to 1940 units were scattered over 130 posts, camps, and stations in the United States, but with mobilization Congress provided funds for new facilities. The Quartermaster Corps, during the winter of 1940-41, built accommodations for 1.4 million men, including divisional posts of the type constructed in World War I.⁷

But as in World War I, equipment shortages could not be quickly remedied and greatly inhibited preparation for war. Among other things, the Army lacked modern field artillery, rifles, tanks, and antitank and antiaircraft weapons. Although acutely aware of the shortages, Marshall believed that the Army could conduct basic training while the production of weapons caught up.⁸

Notes

¹Adna R. Chaffee, "Mechanized Cavalry," AWC lecture, 29 Sep 1939, AWC course material, MHI; Gillie, *Forging the Thunderbolt*, pp. 109, 162-64; *History of the Armored Force, Command, and Center*, AGF Study 27 (Washington, D.C.: Historical Section, AGF, 1946), p. 7.

²Memo, G-3 for CofS, 5 Jun 40, sub: Mechanization, G-3/41665, AGO 320.2 (6-5-40), RG 407, NARA. General Andrews' background was not with cavalry, infantry, or mechanized forces, but with the U.S. Army Air Corps.

³Memo, G-3 for CofS, 5 Jun 40, sub: Mechanization; Notes on G-3 Mechanized Conference, G-

4/23518-69, AGO 320.2 (6-5-40), RG 407, NARA.

⁴Memo, G-3 for CofS, 23 Jun 40, sub: mechanization, G-3/41665, AGO 320.2 (6-5-40), RG 407, NARA; Ltr, TAG to CG of all Armies, Corps Areas, and other addresses, 10 Jul 1940, sub: Organization of the Armored Force, AG 320.2 (7-5-40) M (Ret) M-C, AG Reference files, DAMH-HSO; Historical Data Cards, 1st and 2d Armored Divisions (Armd divs), DAMH-HSO.

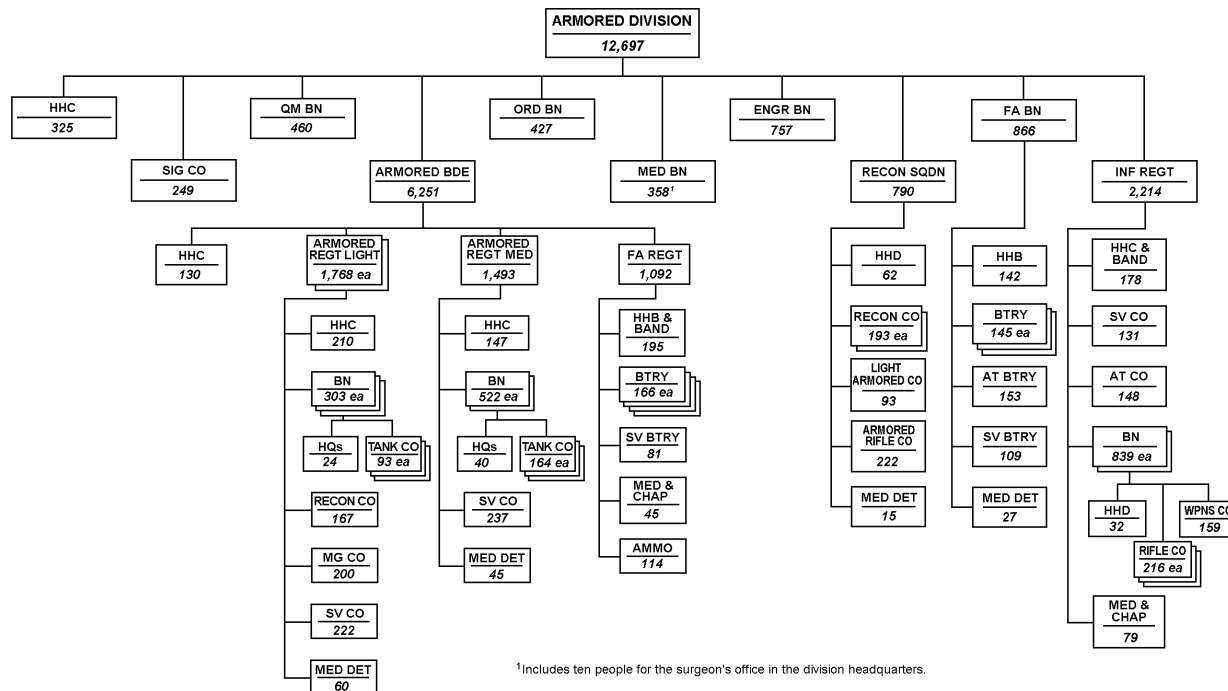
⁵T/O 17, Armored Division, 15 Nov 1940; Ltr, Chaffee to Scott, 9 Sep 40, and Ltr, Scott to Chaffee, 12 Sep 40, Charles L. Scott Papers, LC.

⁶Statement of Adna R. Chaffee, 14 May 1941, Document Collections, U.S. Army Armor School Library, Fort Knox, Ky.; Ltr, Scott to Grow, 3 Sep 40, Scott Papers, LC; Ltr, TAG to CG of all Corps Areas and other addresses, 20 Jul 40, sub: Organization and Movement of Units and Cadres in Connection with Augmentation of the Army to 375,000; T/O 77, Infantry Division (Triangular, Motorized), 1 Nov 1940.

⁷*Biennial Report of the Chief of Staff, July 1, 1939 to June 30, 1941*, pp. 1-3; *Rpt of the Sec of War, 1941*, pp. 67-68.

⁸*Rpt of the Sec of War, 1941*, pp. 62, 68-70; Erna Risch and Chester L. Kieffer, 2 vols., *The Quartermaster Corps: Organization, Supply, and Services* (Washington, D.C.: Government Printing Office, 1955), 2:293.

CHART 14 — Armored Division, 15 November 1940



¹Includes ten people for the surgeon's office in the division headquarters.

Research, Plan, Vision

Training for Operations at the Joint Readiness Training Center

by Sergeant First Class John T. Miller

In the summer of 1995, D Co., 1-8 Cav was chosen to take part in light/heavy operations at the JRTC. We were told that we were the first subunit of the 1st Cavalry Division to be deployed for this training. In addition, the division had been previously tasked with the possibility of rapid deployment to Southwest Asia, especially if hostilities resumed during the cease fire with Iraq. Soon, we would find out what it meant to be fighting on two fronts simultaneously.

As we trained up for the JRTC, Saddam Hussein again began to pose a threat, and all of the elements of the division, except for our company team, deployed to Southwest Asia.

Preparing for the JRTC, we researched available doctrine and “lessons learned” publications on the use of armor in support of light infantry (LI). At the time, there was only one manual that really helped — *FM 17-18 (draft), Light Armor Operations*. No other manual addressed the armor platoon or company missions in support of the LI battalion. (See Figure 1.)

Some of these tasks could be found in our battalion and company METL. Others, like Secure an Exit Route, and Deception, were foreign to us, and not trained for execution at the platoon level. The Vietnam Studies publication, *Mounted Combat In Vietnam*, provided valuable insights into what had been done in similar theaters of operations.

The Liaison Function

The ideal liaison to the light infantry would be an armor major or captain who is a subject matter expert on armor-related issues, including its limitations and capabilities. But in our case, this role had to be filled primarily by the company/team commander and his XO. But we should not limit ourselves to just these individuals. Oftentimes, NCOs with vastly more experience, like senior platoon sergeants and first sergeants, should be included to act as assistant or alternate LNOs. While there may be a bit of an intimidation factor for a platoon sergeant

advising a light infantry brigade commander, I have yet to meet a brigade commander who did not value the insight of a senior NCO.

The liaison function needs to go both ways: information also needs to flow from top to bottom. Those performing the liaison function need to understand the LI

battalion SOP and the battalion’s mission essential tasks.

Rehearsals

Mounted rehearsals are luxuries. Instead, solid drill training and SOP rehearsal is key and will help you come out on top. When you receive a FRAGO,

Light Infantry Battalion Mission/Task	Light Armor Platoon Tasks
Movement to Contact	Overwatch Attack by fire Provide mutually supporting fire Screen Provide direct fire suppression Reserve Counterattack
Attack	Maneuver as lead force Provide suppressive fires Counterattack Attack by fire Isolate an objective Security during consolidation Deceive enemy Screen Support or assault during breach Exploitation force
Defend	Deceive enemy Screening force Security force Reserve Counterattack Cover obstacles with long range direct fires
Delay	Overwatch Counterattack by fire Deception Reinforce Reserve Counterattack force
Withdrawal	Screening force Deceive the enemy Fix enemy attack Detachment left in contact (DLIC) Rear guard Reserve
Raid	Deceptions Attack by fire Secure exit routes Fix enemy force
Passage of Lines	Overwatch Reserve

Figure 1. Battalion missions and platoon tasks.

brief the mission using a terrain model, or my favorite — use playground chalk to create a terrain sketch on the tank's number one skirt to enhance the understanding of the mission, then walk it through and move out. If you don't have a drill or SOP for, let's say, perimeter defense, defense of urban terrain, or convoy security, then you need to get to work and come up with one.

Heavy Teams and Restrictive Terrain

For years, I've been telling tankers that they don't want to tangle with infantrymen in tight terrain. Of course, I always got the macho, "Yeah, right...Crunchies!" reply. But before I ever mounted our cold steel steeds, I was trained in the light infantry as an expert in killing tanks. We had more than TOWs, DRAGONS, and LAWs. We had "Eagle Cocktails," "Roasting Marshmallows" (C-4 on L-shaped attached tree limbs), Molotov cocktails, and Thermite grenades, to name a few goodies.

To the infantryman, the tank is the proverbial dragon. From my perspective, hunter-killer teams would be an armor TF commander's nightmare. Maybe heavy force commanders should consider what type of team to deploy to a LIC/OOTW environment like the JRTC, a mech co/tm vs. tank co/tm.

Between January and March 1967, a study titled "Mechanized and Armor Combat Operations in Vietnam (MA-COV)" was used to examine the combat record of that war's armored and mechanized forces. The group evaluated over 18,000 questionnaires, 2,000 reports, and 83 accounts in which battalions and larger units had participated.¹ The group found that the chief vehicle used to close with and destroy the enemy was the M113 APC, as modified with weapons and gunshields in the ACAV configuration, with its infantrymen fighting mounted. Tanks were used to maintain pressure against the enemy in conjunction with other combined arms operations, like air assault.

Over the years, we may have teased Bradley crews for being "baby tankers," but during one attempted ambush at the JRTC, we watched Bradleys dash into the woods, taking advantage of their smaller size and agility, chasing the ambush teams deep into the heavy woods.

SOP Conflict

There is no excuse for conflicts of SOPs. Train as you fight; therefore, deployed heavy teams should be those already configured in wartime OPLANS

within the brigade or battalion TF. Our company/team's rule of thumb was to establish a relationship with all our teammates. On the personal level, we invited each other to dining-ins and company or platoon parties. On the professional level, we coordinated and trained together during Sergeant's Time Training. Doing this well before any deployment will solidify actions and drills.

Modifying the Route Security Mission

The most taxing of all missions was route and convoy escort/security, as it had been in Vietnam. As General Starry points out in the Vietnam study, "Few tasks were more important than keeping the roads safe and protecting the vehicles, men, and supplies that used them. At the same time, no task was more disliked by armored soldiers."²

From the beginning, we modified the convoy escort task, using a modified strong point approach with internal road-runners, as described in the Vietnam study (Figure 2), and we treated the operation like a passage of lines. These first convoys were the supplies and materials to establish ourselves in country. At the strong point (SP), we halted the convoy to exchange information with the convoy commanders while one tank ran the route to the relay point (RP). Along the route, he called in checkpoints and sitreps. At the relay point, a second tank would run the route back. Once tank two was on the road, the convoy was released to move along the route with an escort leading. This relay would continue until the convoy cleared our area of responsibility and we passed it on to the next platoon to run similar escorts. Bradley dismounts con-

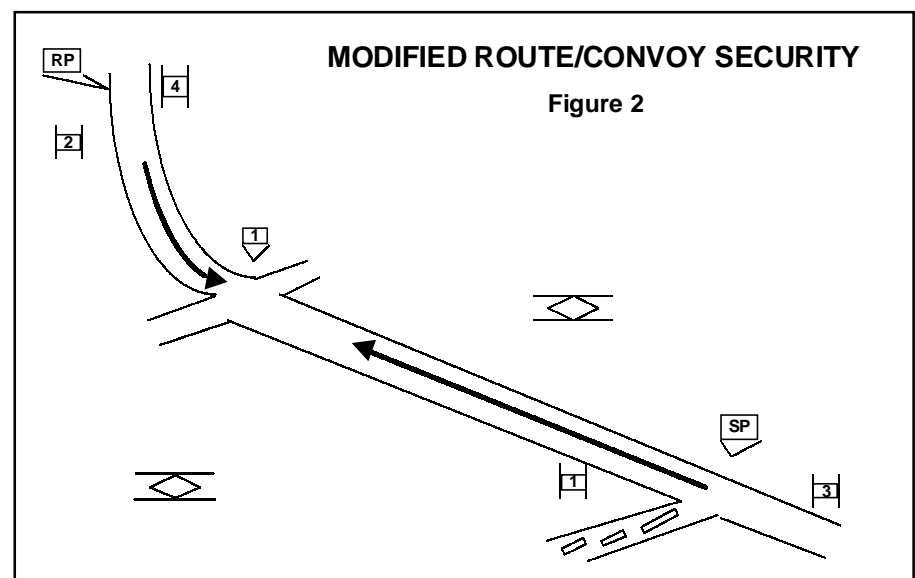
ducted patrols along the route. The results were clear, according to the AAR: the enemy was kept off balance and unable to accomplish his mission, several caches were uncovered, and we never lost a vehicle during the several sorties we ran.

Not only should the LNO ensure time for maintenance and rest, but the platoon leadership must be a pain in the grille doors when it comes to maintaining personnel and equipment. Internally, we followed the cavalry tradition: first horses, then sabers, then self. Our goal was to maintain functioning and nothing more; when pulling back into the AA, walk the track. When in your positions providing security, put the gun tube over the side and check fluids, leaks, air intakes. Stagger security responsibility, clean crew-served and personal weapons, and establish a rest plan.

Direct Fires in MOUT Environment

Urbanization. Half of all the people on the planet live in urban communities. That number will increase two-thirds by 2025. Urban combat disrupts unit cohesion, complicates control, blunts offensive momentum, and causes casualties to soar for all involved.³ Combat can be brutal but brief in villages, or lengthy and agonizing between small isolated units in cities. Tanks find themselves at a disadvantage there. Their agility is limited by narrow streets, where it is difficult to maneuver and even hard to traverse the turret. Tanks are also vulnerable when passing beneath enemy-occupied buildings unless they are buttoned up, inviting

Continued on Page 47



Training Basecamp Security Operations

Role Playing and Imagination

Prepare Brigade Combat Team

For Peace Support Role in Bosnia

by Captain Michael D. Henderson

“There is no approved solution to any tactical situation.”

General George S. Patton Jr.’s statement, from *War As I Knew It*, had the ring of truth, even though we were preparing a unit for Peace Support Operations (PSO). As a heavy tank battalion HHC, we had the mission of assisting in the train-up of 2nd BCT, First Cavalry Division, for an upcoming Mission Rehearsal Exercise at the Joint Readiness Training Center and ultimately for SFOR 5 in Bosnia-Herzegovina. We had little to no experience in this mission.

Plan

We began our ramp-up for the 2nd BCT STX after the 3rd Brigade’s battalion commanders and senior staff officers returned from a leader’s recon in the former Yugoslavia. They brought back input from the SFOR 4 units and from USAREUR, allowing us to begin developing training evaluations and outlines (TE&Os) for scenarios that SFOR 5 might likely encounter while executing its mission. Once mission analysis was complete on the TE&Os, resourcing was the next issue. Faction uniforms, entity identification cards, still cameras, video cameras, civilian vehicles and pyrotechnics were some of the resources required. If they were not available at Fort Hood, they had to be fabricated by 3rd BCT units or contracted from local agencies.

Prep

Upon receipt of the battalion OPORD, we conducted mission analysis for our lane, which was base camp security. After identifying the resource requirements from the TE&Os, we began to fill role player and OC requirements by name. Our OC package consisted of one company commander, two platoon leaders, and two platoon sergeants. We divided the duties into a day and night shift. The night shift primarily focused on security

and observed night infiltrations into the camp. Next, once we identified the role players by name, we appointed “lead” role players and briefed the TE&Os. Once briefed, the “leads” accompanied the OCs on a recon of the base camp.

During this recon, we identified locations for the various events and tried to make logical decisions where the events should take place. After the recon, the lead role players assembled their assigned “civilians on the battlefield” and rehearsed their events. Once small group rehearsals were conducted, the role players performed a full dress rehearsal for the OCs. At this rehearsal, we made our final adjustments.

One key to the role players’ performance was the use of Spanish-speaking soldiers, which enabled the player unit to incorporate the use of interpreters in their training. The bilingual soldiers also added confusion to crowd situations. Soldiers already stressed by large crowds of demonstrators were also challenged with controlling the “civilians” who spoke a foreign language.

The preparation went smoothly, but during the first week of training we identified some shortcomings with our role players. These shortcomings were lack of knowledge on the daily, real-world sitrep in MND-North, key role players not being totally familiar with their duties, and role players recognizing when the player units “do it right.” My concern was that we wanted to reinforce proper responses by the unit. By nature, the role players wanted to be “hostile,” therefore, I constantly emphasized to my OCs to look hard for the desired end-state to each event, to better direct the actions of the role players. Besides being intimately familiar with the TE&Os, the lead role players must be familiar with the *Joint Military Commission Handbook*, or “Blue Book,” which essentially lays out the standards of conduct for SFOR. Finally, once these shortcomings were recognized, we conducted daily intel updates to the role players and conducted back

briefs of the desired end-state to each event.

Execute

When the time of execution came, we approached the training with a gradual escalation of tensions in the region, peaking at about the mid-point of the exercise. My OCs and I tried to logically connect the scenarios with the unit’s phase of integration. For example, during the first couple of days the civilian activity at the front gate was light and the scenarios involved farmers with monetary claims, our logic being that the population was possibly trying to take advantage of the new unit’s arrival and the soldiers’ inexperience. As the days progressed, we steadily increased the stress level, implementing night infiltration, with contractors attempting to smuggle weapons and controlled substances into the camp. We compounded these minor events with other challenges: farmers trying to drop off unexploded ordinance (UXOs) at the camp, individuals taking photos of the camp, injured civilians being brought to the camp for treatment, and drunk farmers assaulting Brown and Root contractors outside the camp.

A key TTP for us was the daily “real world” update from the Former Yugoslavia. This enabled us to keep the battlefield fluid. We used the TE&Os as a baseline, but put real-world twists on them. For instance, when accused war criminal General Krstic was arrested in early December, we used that real-world event to initiate a demonstration by the Bosnian population in support of the arrest, which proved a great success. Also, depending on the reaction of the player unit to different scenarios, we could continue one event over several days. For example, the “Farmer With a Claim” event took four days to reach the desired end-state. Let me paint the picture of the “Farmer With a Claim”: The scenario is that a new SFOR unit has just occupied a base camp and, as with any military operation, the first few days are hectic and

confusing. Consequently, after four years of PSO, the civilians know how to take advantage of new units in theater.

The scenario starts with a farmer approaching the base camp and claiming that an SFOR convoy struck and killed one of his livestock with a HMMWV. The farmer is very upset because his only means of transporting his produce to market is dead and he is unable to make a living. Initially, the sergeant of the guard had no idea in what direction to point the farmer, so on day one little was accomplished. Finally, on day four, the farmer was linked up with civil affairs and JAG and was allowed to file a monetary claim, similar to those filed by soldiers who lost baggage in transit on a PCS move. Filing the claim was the desired end-state for this scenario. Although, the unit reached the desired end-state, the amount of time it took to file the farmer's claim caused agitation among the farmers and a perception that SFOR might be anti-Bosnian, which caused some minor demonstrations at the front gate. Such responses are very realistic in such an ethnically divided region. Because of this dynamic, observing this training was very exciting, due to the fact that no two days were the same.

When developing the TE&Os, our staff developed desired end-states for each scenario, however, these end-states were not carved in stone. Common sense played a large role in the decision-making cycle of the player units. For example, we tried to create a pattern of events in hopes that the player unit would form a pattern analysis of people and events in order to adjust their force protection level, or as a preventive measure to avoid any confrontations with the local populace. On a daily basis, our role players made themselves visible to the base camp, by farming the nearby land, fishing at a nearby pond, and just loitering around the camp perimeter. Sometimes the civilians would be friendly and harmless — at other times they were hostile, drunk, and anti-SFOR.

During the evening battle update briefs of the player units, my OCs keyed in on any local intelligence that the guard force provided to the rest of the task force. Things that we keyed on were who are the leaders of the civilians, their ages, their activities, and the times that these activities occurred, so that if the civilians deviated from their "routine," this became a PIR to the task force.

Also, when General Krstic was arrested, we initiated a scenario with the Bosnian role players being concerned that Serbs were arming in negative response to the

arrest of General Krstic. Consequently, the Bosnians, happy that the arrest took place, insisted that SFOR arrest all of the criminals, but if SFOR could or would not do this, the Bosnians would take the law into their own hands. Once making that statement, we as OCs, began to create scenarios in which the Bosnian Army was training local militias in preparation for a continuation of fighting with the Serbs. This obviously, a very real concern to SFOR, therefore justifying a possible increase of the force protection levels.

Overall, the training went very well, but it was not without difficulties. Our two biggest shortcomings were communication between OCs and control of the role players. During most of the events our OC team was dismounted. The lack of PRC-127s made communication slow, which hindered us in controlling simultaneous events.

We wanted to have OCs at the location of the scenario and in the task force TOC for all events. This enabled us to watch the event unfold and monitor the accuracy of the spot reports to the task force. Aware of both situations, we could make in-stride adjustments to the scenario in order to "reward" the proper response. Due to insufficient comms, at times we lost control of the role players and failed to tailor the event to the response of the unit quickly enough.

In closing, there is no greater training challenge than to train a unit for a mission when little to no doctrine exists. It compounds the challenge when the trainer, in this case me, has no practical experience in performing the mission other than reading some "home made" TE&Os. However, in conducting this mission, I can honestly say that my unit has gained valuable training in regards to the SFOR mission and is much more prepared for Peace Support Operations than had we not worked with 2nd BCT.

CPT Michael D. Henderson is a 1991 graduate of the Boise State University ROTC program. He has served as a tank platoon leader in 2-72 Armor, Camp Casey, Korea, and as a tank platoon leader, tank company XO, and HHC XO in 4-37 Armor at Fort Riley, Kansas. After completion of AOAC, he served as an assistant brigade S3, 3rd Brigade, First Cavalry Division and commander of Delta Company, 3-8 Cav, First Cavalry Division. He is currently the commander of HHC/3-8 Cav.

an ambush (hunter-killer teams train here, too). Urban combat calls for few, rather than many, tanks. This is another reason for preferring the mech company team, where Bradleys can provide close support and assist with fighting the three-dimensional war at ground level, rooftops, and subterranean places like sewers and subways. Many of these targets cannot be engaged with tank cannons because of gun tube elevation and depression limits.

In missions involving movements through and around the urban area, or direct combat with them, we have to start understanding that conventional tactics are of limited use. We must start taking into consideration the activities of the belligerents involved. Are we dealing with a revolutionary uprising, a resistance movement, or terrorism? Anyone training at JRTC will see a mix of all these activities.

Notes

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SFC John T. Miller, who enlisted as an infantryman in 1981, has served as an anti-armor crewman with 3/187 IN, 101st Abn Div (AA), and 1/4 IN, 3d ID. Since his reenlistment in Armor in 1985, he has served with 1/2 ACR; 3-37th AR, 1st ID; and 1-8 Cav, 1st CD. He is a graduate of the Anti-Armor Course at Fort Campbell, Ky. and is a Commandant's List graduate of the 19K ANCOG. He is currently assigned to the 2-16 Cav as an instructor at the Armor Officers Basic Course, Fort Knox, Ky.

An Integrated OPORD Technique

Tips on Trimming Crucial Minutes From the Sequential Orders Process

by Major David Callahan

In a time-constrained environment, subordinates often do not have the time to make the necessary links between paragraphs that are required when using the standard sequential method. The standard sequential method requires subordinates to link previously briefed information from paragraphs 1 and 2 to paragraph 3 as it is being briefed and then link information from paragraphs 4 and 5 back to paragraph 3 in order to gain a thorough understanding of the plan. As a result, critical aspects of the OPORD are often overlooked or misunderstood, which results in an unsuccessful mission.

Parallel Planning

To understand the integrated approach, the company-level leader must understand the military decision-making process outlined in *FM 101-5* and the inputs and outputs associated with the process. Understanding this process enables the company leader to recognize opportunities to be proactive in his orders preparation and issuance. For example, in anticipation of a new mission, or after receiving a mission from brigade, the battalion issues a warning order, which generally includes the type of operation, general location, initial timeline, and any movement or reconnaissance to initiate. With this information, the company leader can begin his initial intelligence preparation of the battlefield (IPB), steps 1 and 2 (define battlefield environment and describe battlefield effects), by analyzing the terrain in his expected area of operation, and can begin his initial timeline for the operation. Upon completion of this initial IPB, the leader can issue a warning order, augmented with a sketch, which provides an overview and analysis of the terrain (big picture) using OAKOC (observation and fields of fire, avenues of approach, key terrain, obstacles and movement, and cover and concealment) and the initial timeline. This essentially serves as your terrain information for paragraph 1 of your order. After receipt of the mission the battalion conducts its mission analysis, which yields yet more

valuable information. The key outputs of the battalion mission analysis are the battalion restated mission statement, battalion commander's intent, refined AO, MCOO, projected weather data, BN/TF SITEMP, and updated timeline. With this information, the company commander can continue to refine steps 1 and 2 of his IPB and begin steps 3 and 4, (evaluate the enemy and determine threat courses of action). The company commander can now issue another warning order providing refinements to the terrain, weather data, SITEMP, and sketch of the enemy which the battalion will fight (big picture). This essentially serves as your enemy situation for paragraph 1 of your order.

After mission analysis, the battalion begins to develop courses of action (COA), analyze the courses (wargaming), compare the courses, and ultimately select a COA during COA approval. The key outputs of COA approval useful to the company commander are the refined battalion commander's intent, and battalion COA statement and sketch which provides the bulk of your friendly forces information necessary for paragraph 1 of the order. Task organization is also generally available after COA approval. With this information, the company commander can issue a third warning order which provides the friendly forces (big picture) information.

As you can see, much information is available prior to the issuance of the actual battalion order if you understand the military decision-making process and take advantage of the incremental outputs throughout its process, rather than waiting until the entire battalion order is issued to begin your orders process. Better yet, you will be better prepared to conduct your METT-T analysis as you determine your restated mission statement and make your tentative plan. In addition, your subordinates will come to the company OPORD with a better understanding of the terrain, enemy and friendly big picture.

Visualization

Visualization at the company level is a prerequisite for success. Proper visualization is often the determining factor in creating a clear, lasting picture of the terrain, enemy, and friendly actions in the minds of your subordinates. Visualization begins with the first warning order and continues throughout the operation. The key to effective visualization is much like the order itself: keep your visualization products clear, concise and thorough. Although your map is necessary for planning and execution, it often is not the best visualization choice due to its small scale. An enlarged sketch often works well for briefing purposes.

For the armor and mechanized force, a Plexiglas battle board (18" x 24") works well as an all-purpose visualization tool. One side of the board has your operational map and graphics and the other side is used for drawing your sketches. Other techniques to assist in your visualization include butcher paper, chalk sketches on the side of a vehicle, or a terrain model. All these techniques and more are useful, but the battle board sketch map technique has multiple advantages and is extremely versatile for an orders group of 6-8 personnel.

As with planning, it is essential that you visualize the terrain and enemy before you can visualize yourself. Your sketches, therefore, should coincide with your warning orders, as discussed earlier. Your first sketch should include the major aspects of the terrain (big picture), which you will address during your terrain and weather analysis using OAKOC. During your second warning order, when you discuss the enemy situation (big picture), you can create a sketch from the SITEMP right on the terrain which you previously used in your first warning order. Another technique is to sketch the enemy on a piece of acetate and place the acetate over the existing terrain sketch. This is a good time to discuss the enemy the battalion will fight (big picture) to include: overview, disposition, composi-

tion, most probable and dangerous COA and applicable forms of contact (visual, direct, indirect, air, obstacles, chemicals, EW). A plus to this technique is that subordinates can now visualize the enemy in relation to the terrain.

During your third warning order, when you discuss the friendly situation (big picture), you can sketch the friendly forces right over the terrain and enemy sketch or use another piece of acetate to visualize the friendly forces scheme of maneuver (big picture). Another technique is to create unit markers (Post-its) to assist in visualizing the scheme of maneuver without cluttering the other sketches. This is a good time to discuss the battalion mission, battalion commander's intent and battalion concept of the operation (friendly big picture). As you brief the battalion concept, to include task and purpose for each subordinate element, you can naturally include the task and purpose of adjacent and supporting units. This friendly visualization in relation to the terrain and enemy will assist in developing a clear mental picture of the operation in the minds of your subordinates. You have just briefed and visualized paragraph 1 of your order through a series of warning orders using the back of your battle board. When necessary you can turn the battle board over to refer to your map and graphics for clarity, but keep in mind how difficult it is to read a 1:50 map with graphics, even from a short distance.

Although a commander can begin to create a tentative plan after he receives the battalion COA sketch and statement, he requires additional guidance, or the completed order itself, to complete paragraphs 2 through 5. Upon completion of your mission analysis, issue another warning order to provide your subordinates with the company's restated mission and your intent to facilitate their parallel planning.

The execution paragraph consumes the majority of the commander's time during planning and preparation of an order. Using the parallel planning process discussed earlier pays big dividends during the development and preparation of paragraph 3, because you already have an understanding of the terrain, enemy, and friendly big picture and can concentrate on developing the company fight. Now it's time to get down to the details required for company level operations (little picture).

Once you have developed your concept, determine critical events that require de-

tailed explanation and create phases associated with the critical events. This next step is the most critical element of preparing and issuing an integrated combat order. Create a series of sketches for each phase of the operation. When creating the sketches for the company fight (little picture), use the similar approach discussed earlier, which began with a terrain sketch, followed by an enemy sketch, then a friendly sketch. It is recommended that you erase the (big picture) sketches from the back of your battle board and divide your battle board into quarters. Each quarter should be sufficient to visualize key elements for each phase of the operation. If you have more than four phases, you can use a piece of laminated butcher paper. Each sketch should be self-sufficient and assist in visualizing the terrain, enemy, and friendly actions. Begin by sketching key aspects of the terrain, for each specific phase, which you determine will assist in the visualizing the terrain's effects (little picture). Again, use OAKOC as it applies to verbally reinforce the sketch. After visualizing the terrain, sketch the enemy over the terrain or sketch the enemy on a piece of acetate which can be placed over the terrain sketch. This is a good time to discuss the enemy the company will fight (little picture) to include: disposition, composition, most probable and dangerous COA and applicable forms of contact (visual, direct, indirect, air, obstacles, chemicals, EW). A plus to this technique is that subordinates can now visualize the enemy in relation to the terrain. Next, sketch company actions and graphics (friendly little picture) over the terrain and enemy sketch. If it appears that the sketch is too busy, remember you can use Post-its to visualize friendly or enemy forces. This is a good time to discuss the company mission, your intent and the concept of the operation (friendly little picture). You can refer to each sketch as you give an overview of the various elements of each phase. As you brief the company concept, highlight any decisive points throughout the operation, identify main and supporting efforts, and include the task and purpose for each subordinate element. This friendly visualization in relation to the terrain and enemy will assist in developing a clear mental picture of the company fight in the minds of your subordinates. For each phase use the following integrated format to assist you in visualizing how the fight will unfold. The bottom line is, if it's important enough to discuss, have it on the sketch, and if important enough to have on the sketch, reinforce it verbally.

Integrated Format

- 1) Terrain (Little picture, "CO/TM" OAKOC) * Big picture "TF" OAKOC covered in W.O. #1
- 2) Enemy (Little picture disposition, MPCOA/MDCOA, "Forms of Contact" for enemy CO/TM is fighting) * Overview, composition and enemy TF is fighting was covered in W.O. #2
- 3) Maneuver (Little picture, CO/TM concept, decisive point, ME/SEs, T/P for each platoon) * Big picture friendly forces missions and TF concept covered in W.O. #3
- 4) Fires (EFSTs)
- 5) Recon and surveillance (Locations, T/P)
- 6) Engineer (Locations, POE/POS, T/P)
- 7) Air Defense (Locations, POP, T/P)
- 8) Service Support (Locations, 35 MMD or FFAMMS)
- 9) Command & Signal (Locations, Cdr's, TOC, CP, visual and pyrotechnic signals, code words)

Use the same format for each sketch, and after the last sketch, you can complete essential elements of paragraphs which did not complement the visualization process. Such elements include various parts of coordinating instructions, succession of command, etc.

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LETTER FROM ALBANIA

from Page 9

The experience another tank commander, Staff Sergeant Scott Wright, remembered vividly was the landing of the C-17 with his tank and crew on board. When the aircraft wheels touched down and the brakes were applied, the tank seemed to strain to the point of breaking free, but it didn't. SSG Wright also considered the mud a considerable adversary, but he wasn't willing to put it in the category of the worst weather and environment he'd experienced. That memory was reserved for soldiering in one of Fort Drum's worst winters. Albanian mud couldn't compete with that and just as it came, one day it dried up and was gone.

Maintaining morale is always an important subject, especially if it is yours. SFC Sumner reflected on the duty aspect of morale. "Guarding an airfield, so to speak, isn't the most exciting mission a tank unit can perform. But considering that, morale is good." As SPC Housey said, a key ingredient in keeping morale up was the buddy system, watching out for each other, as teams, crews, and platoons. He also appreciated the improvements he had seen in camp life. During the deployment phase, the Task Force Hawk commanding general told his commanders and staff, "Right now, conditions suck, but they won't suck for long." The troops see the camp grow; daily improvements were apparent.

Up to this point, I had been enjoying the company of really great tankers, but I also wanted to visit with some of the troops who were keeping the Mounted Force operating, so I moved on to the tank company's support slice. It was comforting to find the company combat trains, tucked in with the tank company team. It was what Armor doctrine tells you to expect: a maintenance team, log pack, and medics tucked in with the battalion task force. Our troops at Rinas Airfield are definitely at the tip of the spear, and they have to be self-sufficient because there is little in the way of host nation support, which occurs more in spirit and security cooperation than in substance. This is no surprise, considering the economic challenges Albania faces even under normal conditions. Add to that the burden placed on the nation by thousands of Kosovar refugees now in the country.



The battalion task force scouts return to Camp Reichert after a security mission, augmenting the infantry guarding an artillery unit set up on a nearby mountaintop.

Organizational and crew maintenance was humming. In a choice spot where gravel was worth its weight in gold, and true hard stand was something used for fixed wing aircraft and maintenance on a very few lucky "helos," I found the company maintenance team, led by Staff Sergeant Michael Hughes, who gave me sound advice on how to conduct maintenance in truly austere conditions. Step one happens before you depart home station, he said. "Double check your PLL (prescribed load list), review your equipment list. Determine your anticipated demands and requisition those items based on the anticipated demand." SSG Hughes noted he had a lot of help from battalion maintenance. When you are the only American tank company in the country, it is good to come with the right tools.

The senior medic, SGT Raymond Wyrwas, said keeping troops healthy was obviously important to him, and that stressing personal hygiene was keeping his troops healthy, but allergies caused the most irritation. I had never heard of "whooping cough dust," but I had had first hand experience with it here. Thanks to SGT Wyrwas I now knew I had succumbed to Albanian "whooping cough dust." Something had to replace the mud, he said. That something was dust.

The medics doubled up to serve in many other ways. The next time I saw them, they were running the ground traffic control point at the southern runway thresh-

old of the Rinas-Tirana runway. Two days later, SGT Wyrwas was running the company command post and monitoring the eastern half of Task Force Hawk's perimeter security. He was tied in with the 2d Brigade Combat Team command post and things were clicking.

For any visitor walking the perimeter and talking with troops, it is easy to recognize the importance of the missions of this deployed tank company and its task force scouts. Professionalism abounded. A good place to close out the visit was with First Sergeant Stephen Lamb. He credited smooth operations in part to the "smart book" his company had developed to prepare for the deployment. Considerable time and effort went into this book, which guided the company leadership through the process of certification and preparation. Documentation covered training, maintenance, family support, finance, billeting, personnel property, privately owned vehicles. The list went on, covering every possible contingency. The first sergeant related how the company had prepared by conducting tactical training and gunnery, performed maintenance, internalized rules of engagement, and discussed base camp operations. I quickly concluded I would be seeing a great deal more of him as I captured lessons learned from a veteran unit, used to deploying.

The next time I saw 1SG Lamb, he had moved the company team to the extreme east side of the Task Force Hawk assem-



At left, the rugged terrain in the Albanian mountains near Tirana. Above, the Co. C, 1-35 Armor command post at the airfield's west side.

bly area. The company area looked good, the tank crews had vigilantly settled into their security and observation posts, the ready reaction force had rapidly worked up and beat its three-minute requirement to roll from a cold start.

It was now time to find battalion task force scouts, who had just returned from a security mission. The platoon had outposted a Task Force Hawk artillery unit in the northern part of Albania, supplementing infantry-provided security to the mountain-top force. Just two and a half hours before I showed up to meet with these scouts, the platoon had been rolling in the gates of Camp Riechert, the task force assembly area.

Staff Sergeant Stanley Johnson had been in Albania about a month, having transferred from Fort Knox, where he had attended the Scout Leader Proficiency Course. He couldn't say enough about the course and its instructors. Everything the course covered he had executed here in Albania, short of calling for indirect fire.

PFC Geoffrey Gleitz spoke with quiet pride as he listed the tasks his section and platoon had performed: route reconnaissance on all of the roads, in all directions fanning out from the task force assembly area, innumerable route and bridge classifications, many without support, some with attached engineers. SFC Alfonso Hankerson, the scout platoon sergeant, was on his third deployment to the Balkans. His platoon had come out of Bosnia five months earlier and had conducted training at an intense pace until their deployment to Tirana in early April.

I asked SFC Hankerson what he would remember about duty with Task Force Hawk. He spoke about how well the platoon had been prepared for the deployment, without knowing it was coming. He had good seasoned soldiers, that was evident. Even the new arrivals from 5-15 Cavalry, 1st Armor Training Brigade had come ready to be trained to the next level. The platoon was humming.

I closed out my scout platoon visit with 1LT Todd Retchless, the platoon leader, who told me he was impressed with the flexibility and versatility of his 19 Deltas. He reported his soldiers had run non-stop, despite many mission changes, many given short notice. The battalion's intense training plan had paid off. Notified during an external evaluation that Albania would be their next destination, he reflected on the confidence the platoon felt in their final preparation and had proven during execution.

I was also lucky to catch a former commander of Charlie Company, Captain Ken Harvey. He had taken Charlie Company to Bosnia the year before, and had turned the company over to Steve Lutsky in July 1998. CPT Harvey was now commander of HHC, 1-6 Infantry. Yes, he is an Armor officer. He compared duty in Bosnia to Albania. Both included operations that revolved around base camps, and relied on Brown and Root contractors for many services, such as laundry and food service. Task Force Hawk was going through some of the same growing pains the IFOR (NATO Implementation Force) had experienced in the early stages of that operation. The similarities made it easy to fall in on this mission.

As I was completing this article, Charlie Company conducted a change of command. The Army process goes on, even in Albania. CPT Lutsky was returning to Baumholder to assume command of HHC, 1-35 Armor. CPT Marshall Miles was assuming command. Charlie Company received a change in mission and assumed control of securing the east half of TF Hawk's assembly area.

Three days later, as his company prepared for a new operation, CPT Miles shared his feelings about being a part of Task Force Hawk. He saw the assignment as an opportunity to show the world that Armor's utility exceeded many expectations. He was proud of the company and making sure his soldiers understood that when the Army leadership or press

spoke of tanks in Albania they were referring to Charlie Company. CPT Miles noted that being on the tip of the spear you had to be ready to point in several directions and shift rapidly when called on. As we spoke, the company was preparing for potentially its second deployment by C-17 tactical airlift. Armor was closing out the twentieth century by conducting airlifts to participate in real world operations. Up to now this capability had only been tested, demonstrated, verified.

It was a good note to close out my interviews. I don't know what will happen next. Things are fluid as I write this. I can't tell you where Charlie Company will end up or what missions the scouts will have. You will know that by the time this article is published. I do know I've been privileged to be here and see members of the Armor force on a new frontier, preparing for a number of contingencies and executing missions in rapid order. That has been a real reward. My primary duty has been to capture lessons Task Force Hawk's Headquarters is learning. I'll bring those observations back to the Armor Center for review and potential application to the Strike Force concept.

You can find members of the Mounted Combat Arm of Decision serving just about anywhere challenges arise and soldiers are deployed. Just like the rest of the troops in Task Force Hawk, soldiers forged with the thunderbolt are adaptive, innovative, and successful. I am once again reminded that excellence is as close as your motor pool, or in distant places like Tirana, Albania. They are ready to employ stealth, mobility, firepower, shock effect and mounted protection to accomplish the mission.

LTC Peter W. Rose II is assigned to the U.S. Army Armor Center in the Directorate of Force Development, currently attached to HQ, Task Force Hawk, Tirana, Albania.

“Destiny”: Readers Respond

Editor's Note: In his article, "Controlling Armor's Destiny," which appeared in the March-April issue, Brigadier General John Kirk (Ret'd.) challenged Armor and Cavalry soldiers to begin a professional discussion on the future of the branch. "We're fat, slow deploying, and too terrain-restricted and logistically hungry for a force projection Army," he began. "We're losing battles of survival at TRADOC, DA, the Joint Chiefs of Staff, and Congress. Armor's life is at risk."

His wide-ranging critique — and his inclusion of his Email address — triggered the beginning of a still-continuing dialogue. Some of these comments, and General Kirk's replies, appear below.

From LTC Rick Jung:

In reference to "Controlling Armor's Destiny," by Brigadier General John Kirk (Retired) — Wow! Great stuff! I wish I could express my thoughts as well as BG Kirk. He has hit the nail on the head. I can't believe that he's been retired since 1983, but maybe that's what it takes, someone outside, looking in, to give us an assessment and a direction.

Throughout my career, Armor has always been on the cutting edge of technology and doctrine. As a lieutenant, I reveled in knowing that I was at the forefront of military innovation and education. Over the years, gradual fiscal cutbacks have not only reduced training in units, but also forced Armor's schoolhouse (Ft. Knox) to operate on a bare-bones budget. It's obvious when you drive onto Ft. Knox that we have a lot fewer people trying to do doctrine and education. I get the feeling we are keeping our head above water instead of, as I mentioned above, leading or being at the forefront of technology, doctrine, and education.

I guess we're in a period of history similar to the years between the First and Second World Wars. In that era, our predecessors decided that military schools and education would be critical to our Army's future successes. Reading General Kirk's article brings to mind that our schools at Ft. Knox need to be the force of change once again. Maybe we can't station as many people as we used to in the schoolhouse, but perhaps the Chief of Armor could form mini-task forces comprised of Armor personnel stationed outside of Ft. Knox. These mini-task forces would be charged with responsibility to perform specific limited functions, for example, reviews of innovative and new technologies, automation applications and their impact on doctrine. Additionally, these task forces can collate and review data with respect to current operations by Armor forces and translate them into future doctrinal changes helping us to build the Armor force of the future. This is how we get straight input from the muddy boots to the laboratories.

We can't wait for the schoolhouse to be the sole impetus of change. I know, as an active duty officer, that the last thing we need is another additional duty, but just like BG Kirk, who takes the time to provide original thought and terse reviews, we can do the same. "We" refers to all Armor officers and NCOs. The Chief of Armor has a great pool of talent and the majority is not stationed at Ft. Knox. They're stationed all over the world. And we all have a wealth of experience and knowledge that we could pass on electronically. The schoolhouse, guided by the Chief of Armor, can then apply their limited resources to lead us into the Armor-Force-After-Next.

It is my firm belief that we have to capture common sense approaches, such as those written by BG Kirk. We've got to review them for applicability and rapidly apply them where necessary. In the words of BG Kirk, "We need to move out 40 years ago" and, we've got to keep moving to stay ahead of our potential adversaries. Let's prepare for the next fight, not the last one and we can best do that collectively, as a team.

From Edward C. Papke, training specialist, former AD sergeant major

Sir, great article. I am not an Armor guy. I am a civilian training specialist at the U.S. Army Sergeants Major Academy (I'm a retired Air Defense sergeant major). I have the good fortune to be "working" at something I really do enjoy. I review all the branch periodicals as they appear. I don't know why I decided to read your article, but I am glad that I did.

We are struggling with the future here at fortress USASMA. We are now attempting to define the "Digital NCO." We don't know what that means, or what it should be, or if it should be. I will re-read your article; it is compelling, but a bit overwhelming for a tired sergeant major.

I am engaged in an on-going dialogue with several of my co-workers about where we were, how we got to here, and where we need to be in the future. We know that we cannot survive as we are now. We also feel that our training institutions are not producing the type and quality of leaders that the Army must have in the future. We knew at the gut-level that the determinists have won; but we also know that we have lost something. We are concerned that at one time we had NCOs that could get things done in any situation or environment, but are no longer able to function. Our school and personnel management systems have been very successful, unfortunately. Today's NCOs and officers are brighter and smarter than ever, but ...?

And what is happening at the Combat Training Centers is really scary. We are seeing the mentality again in Operation Allied Force. Air power will carry the day. The determinists are in heaven. They are beside themselves with

joy. In any case, my mind is reeling and I wanted to get this off with the hope of initiating a dialogue and gaining focus....

REPLY: Appreciated your note more than most others I got. Gratifying as hell that an NCO (active or retired), let alone SMAJ, troubled to read the article, got the drift, sees some use for it. Expect(ed) the officer corps to get their backs up. Wasn't exactly kindly to them.

Here are some derivative notions that apply to the corps of NCOs, 1SG/CSM, their schools:

- For the tactics to work we need sound personal NCO/officer/soldier relationships. Peace/war systems of all kinds — per, log, training, admin — have got to parallel each other damned closely, not quite exactly. Give 'em a mission, push down the resources, coach, measure results, hold folks accountable, give 'em a hand if they need help.

- Demand leadership in bdes/regts/bns/below. Restore mentoring in companies thru brigade. In great armies, officer/NCO corps were mentored and experienced more than schooled.

- Put the management burden and its digits at the levels that can sustain the people/machine/analytical resources, peace and war — division up, no lower.

- Turn the school system from teaching administrative drivel survival skills to a core of value systems, professional relationships, soldier operational skills.

The Army school system has destroyed both the ability/perceived need for E5-O10 to mentor. Our mobilization mentality expects the schoolhouse to turn out consumable sergeant and officer products in much the same way OCS once did, with an emphasis on peacetime systems. Wrong! Stinks! Politicizes the hell out of both corps, degrades ground truth abilities in favor of hands-off test knowledge, builds disabled outfits or ones that operate at far less than best levels.

- Troops end up teaching themselves — from books, tapes, sims. Not very relationship-building.

- And they're always looking over the shoulder for the machine's next conscience-free "gotcha."

Likely prostitution of the proper use of "peacetime" schools, whatever that means, was evident in the late '70s, with PNOC/BNOC. All of a sudden, 1SG/CSM took an "over to you" (the school) attitude. It was reinforced when the corporate body decided "hands on" training/testing were too tough in the early '80s, got them rescinded in favor of something more convenient. The last vestige of results-oriented responsibility went out the window, hence mentoring. CAS3 had the

same effect, providing battalion commanders with admin experts instead of a system simple enough for them to understand, operate, coach the next generation on. Any system so complex that it can't be taught in an outfit's gonna bust in battle.

The NCO corps needs a sound rebellion against this apcray! The AG/PER/LOG pukes have become the Army's dominant forces. It's more dangerous to bust admin stuff than to lose at the NTC/JRTC. I personally believe that schools have the obligation not only to teach, but also to explore our values in an unconstrained, attribution-free environment and report results to people who often don't want to hear them. Ground truth has to be hammered at these glossy guys of all ranks until they get the message....

From COL John Rosenberger, Commander, 11th ACR

BG Kirk, just read your article in *ARMOR* — "Controlling Armor's Destiny." Terrific! When can you come and share these ideas with the leaders of the Blackhorse Regiment? I'll send you invitational travel orders. I'd like you to ride with the Regiment during an NTC rotation and lay out your ideas at OPD and NCOPTD seminars. If you're interested, we can coordinate specific times.

From MG Ed Bautz, Ret'd

John: Am somewhat tardy in letting you know how much I enjoyed your *Armor* masterpiece. There is a lot of good stuff for the thinking reader to profit from. I hope that it stirs up some action in other quarters that have responsibility for the subjects covered...

From MAJ William Loudon:

Sir: It was a pleasure talking to you Wednesday morning. I just finished reading your article in *ARMOR*. Your straight talk on doctrine and circumspect view of the masters of military philosophy is refreshing to me...

From MAJ Dale Wilson, Ret'd

Sir: You're my kind of tanker! I really enjoyed your article in the March-April issue of *ARMOR*. I hope there's more like it forthcoming...

From LTC Edge Gibbons, 2nd Bde., 3rd ID:

Sir: Applause! What a great article — the Army ought to hire you to write the current version of the stillborn FM 100-5....

Your article is right on the money, not just for the armored force, as you well know. I have a couple of questions for you. Why did you decide not to discuss the concept of the decisive point in your comments on Focus? I agree with your ideas, but believe that decisive point is a useful tool to ensure that you focus combat power at the decisive place and time, rather than a place and time.

Second, Sir, you decided not to mention centers of gravity. I know you hate SAMS guys... but CoG can be good if not misused. I guess my problem with killing with a "rapier" is to ensure that you put the rapier in the right place, instead of merely making a lot of cuts.

Finally, Sir, I disagree with your condemnation of "simultaneity." You are right on in that all of us must "share a habitual, almost subconscious, common concept and thought pattern." If we as leaders achieve this end, then the correct application of simultaneity can ensure that we employ the joint/combined team in concert, instead of having things like separate "air campaigns," etc. This helps to ensure the focus which you so rightly point out should be one of our modern principles.

Your discussion of combined arms is absolutely correct, and in my limited experience I believe that it is simultaneously one of the most misunderstood concepts in the Army today. Most guys have this idea that "combined arms are good, and I want some," yet when asked to define combined arms, they can come up with an answer little better than "putting a bunch of different guys/branches/weapons in the same general area and somehow we get this thing called synergy."

What we lack today (the last, best definition of the concept being found in the 1982 FM 100-5) is WHY and HOW we get combined arms EFFECTS. The 1982 manual defined combined arms as "two or more arms in mutual support to produce complementary and reinforcing effects that neither can attain separately." Guys don't know the difference between complementary effects (which result in synergy) or reinforcing effects (that obtain massed effects), or realize that the application of effects must be simultaneous in order to produce the requisite output. This is a problem that continues to get bigger as FM 100-5 grants less and less space to the subject.

...Your article has provided me with some great one-liners that I plan to embed in my command philosophy... and if I am fortunate enough to command, will try to create an outfit that will be fueled by trust and empowered by the willingness to underwrite risk.

Just my thoughts, Sir. Again, they need to give you the 100-5, and maybe we would end up with a unifying body of knowledge that will be applicable to every soldier in the Army, instead of a piece that can allow SAMS guys to show how smart they are at the expense of its relevance to the guys in the trenches.

REPLY: Appreciated your note. You woke the dozing Iclauseclast. Apologies for directness below. Took weeks to make article the kind/gentle/circumspect piece it was. Perception of you to see that it ain't just aimed at *Armor*.

SAMS. Don't hate it! Was one of its early champions. Am damned unhappy with results. Seemed to me its charter should have been:

- Produce, for service in the field at or below corps, graduates of uncommon humility, depth, candor, inquisitiveness, flexibility, ability

and willingness to challenge academic/institutional assertions.

- With the Army War College, conduct unrestricted examinations of the Army's probable geopolitical future and military/political strategy and operational concepts.

- Provide a resource for unconstrained review of Army's present/future doctrine, not its creation.

Misfire! Its founders exhibited symptoms of likely future problems — arrogance, elitism, narrow preconceptions, rather than broad, open spirit of inquiry. General officers, whose own ignorance/compliance orientation made them "me too's," unquestioningly embraced SAMS' headings, vice protecting their Army from institutional/individual misdirections, and demanded graduates as planning aides de camp to conceal own weaknesses. Besides attitudes, some SAMS follies:

- A syllabus that invests too much student time on marginal payback studies. Burn, start again.

- Abusive use of the institution by TRADOC/DA as a "house" resource. Assignment of responsibility for FM 100-5 puts the doctrinal/other saddles on exactly the wrong horse. Rather than challenging assertions, the director is saluting the same flagpole as the rest of the Army. Wrong! SAMS (and AWC) should be our Army's conscience, not its sycophants.

- Abusive use of the graduate resource. Assignment policies suck! More of the graduates should have been assigned to bns/bdes to use their knowledge, help them develop IIE. Should not have been tagged by PER for special handling.

- Bum results. The initial recom by the Jedi Korporation to Schwarzkopf was world class dumb. And it took a SecDef and president to fix, not a soldier. Criminal.

- Lousy perspective. Our sense of history, never very damned good, has diluted both "jointness" and the utility of military advice to our civil masters. SAMS is contributing.

- AirLand, one of TRANARC's few good works, is dead. The ghost of Billy Mitchell haunts not only USAF, but also us, broadly, in our artillery, Army Aviation and intelligence. Twenty years of SAMS should have bought us better knowledge of brother services. AF history is much our business lest past repeat. Army shouldn't have let spirit of Patton-Quesada team die.

- Jugularlessness. Saddam.

- Lack of strategic grasp. In Bosnia, Yugo, we've let the Europeans saddle us, our president, with responsibility (world's view) for their (Europe's) corporate historical fears, a "new" villain in Milosevic, a bungled air campaign. FYI, Milosevic's Dad (or G'pa) exhibited same characteristics in WWII, hurt US/UK efforts to support anti-nazi guerrillas. Who knew that, recommended prophylaxis to prevent recurrence? We're shallow.

- NATO's earned our support in resolution of their continental problem, not assuming its burden of global hostility. Clark should have been yanked out, a European put in the catbird seat. Need for us to be a peripatetic world's policeman makes us ugly Americans often enough.

- The arguments/decisions/tactics being used in the air campaign smack of Pinetree, Whitehall, and Downing St., 8 USAAF/Bomber Command, WWII. The names have changed. Add to the three authors cited in my article as "should reads" for Army guys, particularly SAMS; USAF History and Strategic Bombing Survey, of WWII and Gulf. Clark/Macgregor should know better analytically, factually, historically.

- Studying stuff to death. We need guys who can decide/recommend (without pretentious quotes or cites) in seconds and minutes in a mission-tailored framework, not days/weeks, in accordance with a preordained matrix of abstract theory or in studied repetition of history.

Bottom line is that we need SAMS/its products, but they must have apostolic humility, not view themselves as Napoleonic figures or faculty to an Army.

Clausewitz. Bright fellow, but the Freud of battle, confusing more analysts/patients than he ever helped. His battle analyses are largely long OBE. We have struggled much too hard trying to hang something finite or tangible on shifting sands to preserve his name or "greatness." Center of gravity, my opinion, was bilge when it left Clausewitz' pen. If not, its brief life ended when we figured out what to do with steam and the electron. The whole argument's now specious at best, geometric predestination at worst. There are three parts to a man's, army's, or nation's ability to fight — a reason, will, means. COG is undefinable as shown by inability of anyone to find one, save maybe the orientals. Schweinfurt? Ploesti? What's Milosevic's? Where was Ho's or Giap's? Ours in RVN wasn't where anyone thought — except NVN. Our streets, the Congress, the political will of the president, our fielded force, Uncle Ho's trail, etc.?

Decisive Point. If there is such a thing, it's a threshold rather than a time or place — your opponent loses the initiative, freedom of action and you seize/retain it. It may be time, place, psychology, reduced capability or event. Another throwback to what was often pretty obvious on a smallish battlefield full of visual cues.

Before moving to other points/terms, it's useful to get at our vocab problem. Just as we search for deterministic equations, we seem compelled to hang a term on everything we do. Music's illustrative. As in battle, we try to employ X instruments to get a result. In music, winning over the audience is winning. In battle, it's winning over the enemy, physically, psychologically, or both. In music, we have a shared language. We keep inventing one for fighting.

Simultaneity. Argument stands. In music, we only occasionally want everything to play at

the same time. It repeats synchro's problems of general understanding, operational utility. Simultaneity's possible/useful only when it's affordable. In conditions of parity or marginal superiority, we just can't attack everything at once — violates FOCUS. Nice notion, but often needs a resource richness we don't enjoy or shouldn't demand as a share of the Army's/nation's total. On the other hand, there are ways to fake it. We need to learn them as a skill.

TacAir's an easy example. Missions which used to be air superiority, interdiction, air support have necessarily changed to ADA/C2 and air sup, then the other two, generally in priority (sequentially), not simultaneously. Arty can seldom FOCUS fires when doing GS, GSR, DS concurrently. You can't be combined arms-strong everywhere at once. Multiple crossing sites, multi-penetrations of obstacles, even multiple combined arms teams are only possible when you have plenty toys. Look at what happened to Schlieffen. Cause, effect.

Synchronization. Musically, it's sparingly used, then for a purpose. Same in war. Lock step, inflexible, of limited operational use — Frederick's squad drill transposed to this century. Worst of all, it becomes boringly predictable. Our entire "joint" operational concept is globally clear, can be countered without huge resources or great cleverness. By practice, psychology, doctrine and airframe/weapons stockage USAF is less TACAIR capable than it was ca. 1980.

If I were a hostile, I'd invest heavily in Tandy, buy lots of Radio Shack ADA/C2 phonies, sink bucks into mobile ground forces well-protected by LOMAD/SHORAD, draw USAF into a fake air unbattle, and attack like hell an Army dependent on its organic CS.

Harmony. Generally what we're after, does produce synergy, infinite variations, surprise.

Asynchrony. What we're trying to create in his outfit, but we may use it in ours to achieve surprise by breaking a mold or to create the impression of chaos in our force.

Asymmetry. Bogus term. Superiority, as defined, de facto does this.

Synergy. Delete term. Found it first in Soviet doctrine of the late '50s. No one understood it then; few do now. Confused the hell out of the first O3-O6 I tried it on. Everyone started searching for an equation to get some. Putting determinism and probabalism on the same page is easier. There are times when reinforcing is as synergistic as complementing and is complementary. We need plain words/ concepts, neither conceiving nor talking like lexicographers.

Back to the harmonization/synchronization question: I knew what DuPuy meant, but he sure as hell picked the wrong word for an Army. "Effects of..." is as confusing as synchronization/synergy. We need results — suppressed, disabled, or destroyed. I have yet to figure out "% destroyed." Must mean we also have guys who are lightly, moderately, or

severely KIA. Do we create "effects" of death, destruction, suppression?

You're on the right assignment track. Humility/simplicity would be the biggest gift you can have/give others. Genuine thanks for your thoughts/kind words. If my response disappoints, there remains room for honest disagreement, even among pros.

More than any other factor, parachute mafia has strangled the Army.

A voice from the sky (or monitor) is no substitute for command presence on the ground.

Good Hunting
K

Remembering a Comrade In Berlin Standoff

Dear Sir:

Space prevented recognition of a fellow Armor soldier and cavalryman in my article, "Controlling Armor's Destiny," in the March-April *ARMOR*. TF Tyree, the U.S. force at the checkpoint that day, was led by MAJ Thomas B. Tyree, commanding Co. F, 40th AR, Berlin Brigade. The TF was comprised of a cross-attached mech company and Tyree's four-platoon tank company. It's said that the Checkpoint Charlie face-off broke before he had unpacked his foot locker or duffle after transfer from USAREUR to Berlin.

It was a fine performance under huge stress, complicated by his unfamiliarity with the Berlin perspective/situation. Tyree had earlier commanded a tank company in USAREUR, later served at HQ, SHAPE, and commanded a cavalry squadron in Vietnam in '67-'68, where he earned two Silver Stars, a Bronze Star with V, and other awards. COL Tyree retired in 1971 and has since died.

JOHN KIRK
BG, Ret'd.
Tacoma, Wash.



The scene at Checkpoint Charlie, as U.S. M-48s, rounds in the chamber, faced off against Soviet T-55s. Story author BG John Kirk, then a captain, was in the jeep next to the guardhouse in the center of the photo.

SOLUTIONS — Tactical Vignette 99-2

“The Passage at Wilcox” from the March-April 1999 issue of *ARMOR*

Author's Solution

FRAGO:

Guidons, this is Black 6, FRAGO follows:

1. SITUATION.

a. Enemy. A T-72, two BMPs w/squads and a ZSU-23-4 have been reported within the town of Wilcox. The tank location is unknown but the TF scouts have heard it moving throughout the town. One BMP is located vic 782514 and the ZSU-23-4 is located vic 783543. Two squad-size elements have been identified at vic 784518 and 793524. An obstacle is located vic 802523 and is reinforced with wire and mines. I believe the enemy is defending with 2 BMPs forward and the tank in depth. The unidentified BMP is likely located near the infantry squad in building L overwatching the obstacle. The tank is likely to be located within the town ready to reposition to support either BMP.

b. Friendly. Comanche Team has cleared the enemy forces up to the 49-grid line and has established a hasty defense. Apache Team is on our left flank and attacks to seize Obj 1 in order to protect our left flank. TF 4-7 AR is on our right flank and is attacking to secure an alternate passage lane within their sector. TF 2-72 AR is located to our rear as the brigade reserve and is preparing to continue the brigade attack to the north.

2. MISSION.

Team B attacks to secure a passage lane (RED-SKIN) from PL KENTUCKY to the LOA (PL TENNESSEE) in order to support the forward passage of TF 2-72 AR.

3. EXECUTION.

Intent: Our purpose is to secure a passage lane to allow TF 2-72 AR (on order, the brigade main effort) to continue the attack to the north. We must suppress the enemy to gain a foothold and seize our OBJs. We must clear the lane of all obstacles allowing the use of the passage lane by the follow-on task force. Then we must prevent the enemy from placing fires on TF 2-72 AR during their forward passage. Our endstate is platoons occupying OBJ L, OBJ T, and OBJ U oriented north to northwest and all remaining enemy forces contained within the town, allowing no direct fires on the lane.

a. Concept of Operations.

1) The team will move through C team in a company wedge, platoons in wedge formation with 1st platoon (mech) as the lead element, 2nd platoon (tank) on the left flank, 3rd platoon (mech) on the right flank, and the Sapper Platoon following 3rd Platoon. Traveling technique of movement. Once the team passes through C Team vic PL Kentucky, we will execute traveling overwatch technique of movement oriented north/northwest of the passage lane. 1st Platoon will occupy SBF1 and destroy the BMP vic 782514 and suppress the enemy to protect 2nd

Platoon. 2nd Platoon will occupy SBF 2 and suppress enemy forces to support 3rd Platoon's attack. 3rd Platoon will attack along AXIS MUSTANG to seize OBJ L. Once 3rd platoon seizes OBJ L one section of 3rd Platoon will occupy SBF 3 to protect the Sapper Platoon. The Sapper Platoon will follow 3rd Platoon, once OBJ L is seized and SBF 3 is occupied, it will breach the obstacle vic 802524 and continue to clear the passage lane as we attack to the LOA. 1st Platoon will attack to seize OBJ T. 2nd Platoon O/O will attack to seize OBJ U. Once the OBJs have been seized infantry elements will dismount and clear them of all remaining enemy forces. Once OBJs are occupied, platoons will orient north by northwest to prevent enemy direct fires on the follow-on task force's passage. 1st

Platoon will overwatch the RP. On order, the XO will move to the SP to establish link up with TF 2-72 AR and lead the task force to the RP.

2) Fires: Priority of FA fires is with 1st Platoon. Priority of mortar fires is with 3rd Platoon. 1st Platoon, destroy BMP vic 782514 in order to allow B team the freedom of movement once we pass the 49-grid line. 3rd Platoon obscure enemy in order to support your attack to seize OBJ L. 3rd Platoon, continue to fire vic. 802524 to provide obscuration for the breach element.

3) R & S: The task force scouts will move behind our company as we attack to establish a screen along the LOA (PL TENNESSEE). XO coordinate with the scouts and keep us informed

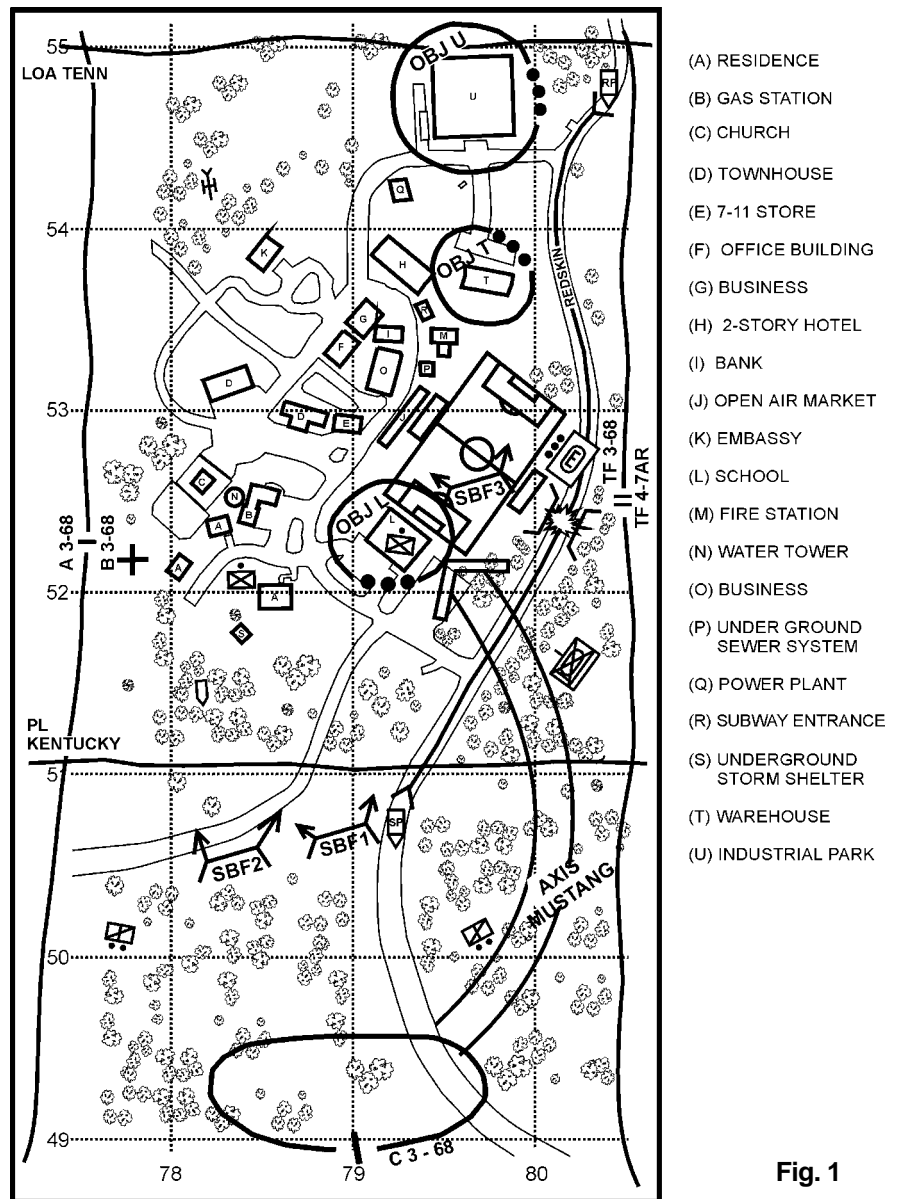


Fig. 1

of their plans and locations to prevent any fratricide.

4) Intel: We must be able to locate the tank.

b. Task to subordinate units:

1st Platoon (Red): Lead element in formation. Suppress enemy from SBF 1 to protect 2nd platoon's occupation of SBF 2. On order, attack to seize OBJ T to protect follow-on forces during their movement through the passage lane and overwatch the RP.

2nd Platoon (White): Initially move on left flank of the company wedge. Suppresses enemy forces from SBF 2 to protect 3rd platoon's attack on OBJ L. On order, seize OBJ U to protect follow-on forces during their movement through the passage lane.

3rd Platoon (Blue): Initially move on the right flank of the company wedge. Attack along AXIS MUSTANG to seize OBJ L. Then move one section to SBF 3 and suppress enemy forces to protect the Sapper Platoon as they breach the obstacle.

Sapper Platoon: Follows 3rd Platoon. On order, breach obstacle at grid 802523 and continue to clear the lane behind our attack in order to provide a trafficable lane for TF 2-72 AR.

Black 5: Move with Blue to assist them with additional firepower to protect the Sapper Platoon. On order, move to the SP. Link up with and lead TF 2-72 AR along the lane to the RP.

Fist: Follow Red set SBF 1. Adjust artillery and mortar fire. Call artillery fires on BMP in open vic 782514 and then smoke and suppression to protect the breach vic 802527. Fire smoke and suppression for 3rd Platoon's attack on OBJ L with mortars.

Black 7: Initially set vic PL KENTUCKY behind SBF 2. On order, move along AXIS MUSTANG set vic 802513 and support reconstitution and recovery.

c. Coordinating Instructions:

New operations overlay (Fig. 1) is being sent over IVIS.

4. SERVICE SUPPORT: No change.

5. COMMAND & SIGNAL:

a. Command: I will move with 1st Platoon.

b. Signal: No changes.

Rationale

To accomplish the mission B Team must secure a lane for the follow-on task force. The goal is to avoid costly, time consuming fighting in the town and secure a lane as quickly as possible. The plan is to seize key positions that control the lane and only engage those enemy forces required to secure the lane. OBJs L, U, and T are key to controlling the lane. From these positions the company can prevent the enemy from interfering with the passage of TF 2-72 AR. Initially a mechanized infantry platoon and tank platoon supported by artillery destroy the known enemy BMP and suppress remaining enemy forces to support an attack to seize OBJ L. With massed suppressive fires from the two platoons in SBF 1 and SBF2, a mechanized infantry platoon sup-

ported by mortars can rapidly seize OBJ L. OBJ L provides a position of advantage for the platoon to protect our breach of the obstacle and provides a commanding position overwatching all the southern approaches into the passage lane. Once the obstacle is breached, the tank and mechanized infantry platoon move from their SBF positions to seize the remaining two objectives, being protected by the suppressive fires of the platoon on OBJ L. With OBJ L, OBJ U, and OBJ T secured the company can effectively overwatch the lane and suppress or destroy any enemy forces attempting to interfere with the passage.

Reader's Solution

(From the officers of Co. B, 2d Tank Battalion, 2d Marine Division, 2d MEF)

"Guidons, guidons, this is Black Six, FRAGO follows, break..."

1. SITUATION

Task Organization

Effective immediately an engineer platoon is attached to Team Barbarians.

Friendly:

Team Apache is on our left flank. Team Comanche has cleared all enemy forces up to the 49-grid line. They are currently in a hasty defensive position. TF 4-7 AR is on our right flank and is tasked with securing an alternate route. Two scout sections are located to our front at grids 508778 and 504797.

Enemy:

TRP Zulu, office building, located at grid 534789. Alpha 1, one ZSU 23-4; Bravo 1, one BMP with dismounted infantry squad positioned near an underground storm shelter. Bravo 2, one dismounted infantry squad located in a school. A road crater at 524803 is reinforced with wire and mines. The location of another BMP are unknown. Scouts report hearing track vehicle noises they believe to be a T-72. Some civilians are believed to be hiding in their homes.

2. MISSION

O/O Team Barbarians secures a passage lane from PL Kentucky to PL Tennessee IOT allow the passage of TF 2-72 AR through our lines.

3. EXECUTION

Commander's Intent

Higher's intent is for Team Barbarians to facilitate the passage of follow-on forces. The final result desired is for all enemy hard targets to be destroyed. One tank platoon will set on PL Tennessee with two mechanized platoons securing the passage lane.

a. Concept of the operation

(1) Scheme of maneuver. Team Barbarians will conduct a deliberate breach with one platoon establishing a support by fire position. The tank platoon will conduct a breach at the road crater to allow follow-on forces to reach PL Tennessee. The remaining platoon will secure the passage lane. Once the breach has been affected, both

mechanized platoons will provide security for the passage lane.

(2) Fires. The purpose of indirect fires is to support our breaching operation. First platoon has priority of fires from mortars to suppress enemy positions. Second platoon has priority of fires from artillery for obscuration and suppression. The first unit to gain eyes on the ZSU 23-4 gains priority of fires from artillery.

a. Tasks to subordinate units

1st Platoon: Establish a support by fire position vicinity of grid 508788. Suppress all enemy positions within Bravo 1 and immediately report the position of the T-72 and the second BMP. Your left lateral limit is the church. Your right lateral limit is the school. Once the breach is complete, defend the passage lane oriented to the west from checkpoint 1 to checkpoint 2. You have priority of fires from TF mortars.

2d Platoon: Breach the obstacle located at grid 524803. You have a platoon of engineers attached to you initially. Upon completion of the breach, detach the engineers to 3d platoon. Proceed to PL Tennessee and screen to the North. BPT facilitate the forward passage of TF 2-72 AR through our lines. You have priority of artillery throughout the mission.

3d Platoon: You are designated the assault force. Follow in trace of 2d platoon during the breach. You are responsible for adjusting artillery fire for 2d platoon. Upon completion of the breach, defend the passage lane from checkpoint 2 to PL Tennessee.

Engineers: You are attached to 2d platoon and will provide engineer support during the breach. Upon completion of the breach, continue to improve the passage lane for follow-on forces.

b. Coordinating Instructions:

The following checkpoints have been added:

CP ET- 515796

CP 2 ET- 530804

4. SERVICE SUPPORT

No change

5. COMMAND & SIGNAL

a. I will be with the support force and the XO will move with the assault force.

b. All vehicles will display a green flag to indicate an open passage lane through the obstacle. The alternate signal is green star cluster.

Rationale

The mission is best accomplished by avoiding the potential MOUT situation. The decisive point during the mission will be the breach. The locations of the T-72 and one BMP remain unknown, therefore the tank platoon should be the breach force. Second platoon provides more armor protection and precision firepower to the engineers. The Bradleys will be able to provide adequate suppression on the enemy dismounted infantry squads and the known BMP. It is important to protect the passage lane until TF 2-72 AF passes through our lines. This can be accomplished by positioning second platoon along PL Tennessee and both mechanized platoons along the route.

The Lorraine Campaign: Patton's Bloodiest Test

Patton at Bay: The Lorraine Campaign, September to December 1944 by John Nelson Richard, Praeger Publishing, Westport, Conn., 1999, 320 pp., \$45.

The author has written an ambitious, provocative, and well-researched account of the Lorraine Campaign. Moreover, he has taken on the daunting task of examining George Patton's generalship. Richard suggests Patton failed to wage the most effective warfare possible.

During late July and early August 1944, Patton's Third Army spearheaded Operation Cobra, the unforgettable breakout from the Normandy beachhead. Throughout August, the Third Army was a battering force that rolled practically unchecked through Rheims and the great Champagne vineyards, through Verdun, with its gruesome reminders of the horrors of World War I, and the Argonne, where Patton was wounded and nearly died in 1918.

Following the advance across southern Normandy, the only logical employment of Third Army was for it to proceed into the Province of Lorraine, which was the shortest route to Germany. This was in keeping with Eisenhower's strategy of advancing on a broad front and eliminating the enemy's fighting units west of the Rhine.

With German forces in total disarray at the end of August, a virtually undefended Lorraine beckoned. Patton pleaded with his boss, General Omar Bradley, that if Third Army could be allocated enough fuel — as little as 400,000 gallons — he could be inside Germany in two days. Time was crucial before the inevitable reaction by the Germans to shore up their defense, preventing Patton from advancing to and penetrating the Siegfried Line. Bradley refused Patton's request for more fuel. Unfortunately, the farther and faster Allied armies advanced, it became more difficult to sustain supply lines. Consequently, by early September, Third Army had ground to a virtual halt along the flooded Moselle River. In places, Patton's tanks and vehicles literally ran out of fuel on the battlefield.

The sudden turnabout from pursuit to static warfare within the space of a few days ended any chance of rapidly cracking the Siegfried Line. Instead, from September until mid-December, Patton was forced to direct a frustrat-

ing battle for Lorraine, plagued by supply shortages, critical interference from superiors, flooded rivers, fortified cities, difficult terrain, untrained troops, dreadful weather, and the most powerful of the German armies in the West. Patton had little opportunity to wage a fast, successful campaign.

The author, a graduate student in military history, has failed to avoid the passion evident on both sides of any discussion of generalship that typically challenge traditional views through newly uncovered evidence, or by highlighting a less considered perspective. Historian B. H. Liddell Hart maintained that, to make an accurate judgment of generalship, the historian had to consider conditions and relative resources, along with those factors that lie outside a commander's control.

Richard insists that in order to pass judgment on Patton's part in the Lorraine Campaign, he did, for the most part, work within the general guidelines suggested by Liddell Hart.

However, the author neglects to give proper weight to uncontrollable factors in the Lorraine Campaign. Instead, he tends to resort to partisan judgment, and at times seems slavishly bound to condemnation of Patton. For example, he argues that Patton did not fully appreciate the drastic change in terrain, and completely misread the ability of the German Army to stand and fight. Few historians would accept the comment without debate, in light of Patton's comment that at Luneville and Arracourt east of Nancy was, "As bitter and protracted fighting as I have ever encountered."

Richard deduces further that Patton's fascination with the West Wall and the Rhine blinded him to the fact that problems posed by intermediate objectives, like Metz, required immediate attention. He condescendingly suggests that Patton, an astute student of war, should have taken time to read *FM 31-50* as it pertains to the attack on fortified positions. Richard censures Patton for not visiting XX Corps often enough in September, when in fact the author includes a list indicating nine visits by Patton or a staff member during September. It is not uncommon for a staff officer to represent the commander.



By mid-September, 1944, the Third Army had been in near-continuous combat for nearly two months. The author's crowning judgment was to condemn General Patton for taking a Sunday off to play with his pet dog.

There is no question that the Lorraine Campaign, fought between Third Army's greatest triumphs — Operation Cobra and the relief of the Bulge — became Patton's bloodiest and least successful campaign. Richard argues that Patton cannot be excused from his failure to make sound tactical decisions. He further concludes that the general's difficulties were caused sometimes by a failure to face the obvious, but also with the incompatibility of his established battle philosophy with the battle conditions in Lorraine, particularly his concepts of minimal interference and the utilization of speed.

Historians judge performances and perpetuate or revise early impressions. There is no way objectively to measure generalship — each circumstance in which a general officer serves is unique. Whether the prolonged outcome of the Lorraine Campaign was due solely to generalship or uncontrollable factors — or a combination of both — remains debatable.

The author's well-written study of the Lorraine Campaign is useful because it has been thoroughly researched, drawing heavily on Hugh M. Coles' official history of the Lorraine Campaign and a broad range of other sources. The book is supplemented by full orders of battle, casualty and equipment losses, maps and period photos. Assuredly, *Patton at Bay* is required reading for scholars of WWII.

DENVER FUGATE
Radcliff, Ky.

Maneuver and Firepower: The Evolution of Divisions and Separate Brigades

by John B. Wilson, Center of Military History, United States Army, Washington, D.C., 1998. 469 pages. \$36.00, hardcover.

Of the division, Sir William Slim in his 1956 book, *Defeat Into Victory*, wrote that the division is "the smallest formation that is a complete orchestra of war and the largest in which every man can know you." Of course, the division as a military unit is a complex organization designed for independent and sustained combat operations, but its history in the U.S. Army has not always been easy or even well understood.

The Army Lineage Series, sponsored by the U.S. Army's Center of Military History in Washington, D.C., has now produced a comprehensive history of the evolution of army divisions and separate brigades in this lengthy and detailed publication. The author, John Wilson, worked as an army historian for 31 years, and actually completed this book seven years ago. To cover the gap from completion to publication, he has added a very brief chapter on divisional organization in Desert Storm, along with an allusion to the future. This is a government publication. There is no International Stock Book Number (ISBN), so you will not be ordering this through your local bookstore. Copies may be obtained through the Superintendent of Documents at (202) 512-1800.

Divisions have been around the Army for more than 200 years, but the early theorists and commanders had the same divisional problems in George Washington's army as in today's army - how to combine combat arms, combat support, and combat service support into a balanced, efficient fighting unit capable of independent operations in a wide variety of conditions. That sounds like an easy task, but as Wilson so deliberately reveals, it was anything but easy. Wilson's study clearly shows that the army division is now, and always has been, a work in progress.

From the American Revolution to the 1990s (and certainly on into the 21st century) the combat division has been a fluid organization whose structure seems to be constantly changing. Ideally, the structure of a division must certainly reflect its combat mission (infantry, armor, airborne, etc.) with firepower, mobility, maneuverability, and sustainability as key ingredients. Other factors, however, much beyond its control have had the greatest impact on the evolution of the division as a fighting organization.

Terrain, tactics, the theater of operation, and the enemy have always influenced division organizational structure, but technology, politics, and economic limitations have also weighed in heavily on how the U.S. Army would organize its divisions. In the 18th and 19th centuries, the size of a division was most often limited to the span of control of a commander who could see all his forces from atop a horse. It was thought that "the management of 2,000 men in the field was ample duty for a brigadier general." In the 20th century, divi-

sions assumed a combined arms pose, with artillery being added to infantry divisions, armor and motorized units replacing cavalry. Size varied from 11,000 soldiers to 28,000, depending on which war, which peacetime interval, or which visionary drew up the plan. Cost was a huge player, with many divisions looking great on paper, but not manned or equipped as advertised. Sadly, politics too influenced smart decision-making. During World War I, National Guard forces were formed by state-based on a patronage formula of 800 men for each U.S. Senator and Congressman.

However, tinkering with divisional structures needed to be an ongoing process as innovations (ours and the enemy's) changed the face of every war, and Wilson's study covers all the divisional evolutions from the War of 1812, to the Pentomic Divisions of 1955, the "flexible response," the AirLand Battle, and the 1980's "Army of Excellence." He includes both the sound concepts and the silly proposals that were "completely unacceptable intellectually and scientifically."

The history of the separate brigades is much shorter, since they were officially established during the period of 1961-65 as a spinoff of the ROAD, "Reorganization Objective Army Divisions." At that time, the Army determined that it needed separate brigades "for unique missions not appropriate for a division," to be task organized for special purposes. Airborne, jungle, and arctic roles appear to have been special mission considerations.

There is a lot of detailed material in this history, and it serves more as a definitive reference book than as entertaining reading. That said, however, it is well-researched, amply supported by photos and charts, and is clearly presented in a very usable and informative manner, especially for the scholar and student of military history.

WILLIAM D. BUSHNELL
COL, USMC (Retired)
Sebascodegan Island, Maine

Vietnam Military Lore: Legends, Shadows and Heroes by Ray Bows, Bows and Sons, Hanover, Mass., 1998. xv + 1180 pp. Maps, photographs, glossary. \$50.00.

Readers interested in a soldier's eye view of war rather than an intellectually detached analysis of it are likely to find *Vietnam Military Lore: Legends, Shadows and Heroes* hard to put down. Each of the 53 brief chapters is the story of an American fighting man, the principal focus being on those who were killed in Southeast Asia between 1945 and 1965. Relying mainly on personal correspondence and interviews with friends and relatives of the fallen, Ray Bows, a retired career NCO and Vietnam veteran, fills in many of the gaps left by the conventional "history from the top down" approach. Save for the brief write-ups that accompanied commendations, little of this lore was part of the public record and Bows is

rightly determined that the warriors not be forgotten. But, although an army attracts all types, the author's "heroes" usually fit a definite profile. They are idealistic, patriotic, competent and, of course, blessed with supreme physical courage. Overwhelmed by the book's numerous accounts of noble sacrifice and uneven odds, one cannot help but see thematic parallels with Homer and Herodotus.

But celebrations of courage do not in and of themselves constitute balanced assessments of cause, conduct, or effect, and this collection of anecdotes offers little else. Like many a Vietnam veteran, the historical profession has itself only recently begun to come to terms with U.S. military involvement in Southeast Asia. Until Shelby Stanton's *The Rise and Fall of an American Army* first appeared in 1985, readers who sought to know more than one side of the controversy were left to steer an uncertain course among white paper white-washes, journalistic lynchings, and grunt's-eye view reminiscences, many of which engaged or enraged, but none of which brought "closure."

The author's "worm's eye view" (p. ii), which often emphasizes the betrayal of the American soldier by the South Vietnamese — and by his own superiors — does not bring closure, either. True, one can still welcome this work as a counterpoise to politically motivated left-of-center distortions of the historical record, and no qualified critic would dare suggest that U.S. policy makers were uniformly competent or honest. Nevertheless, *Vietnam Military Lore* breaks no new interpretive ground, and it suffers from an imbalance every bit as pronounced as that inherent in the impersonal academic analyses it seeks to augment. While roundly lambasting the corruption inherent in virtually every level of Vietnamese society as well as the moral cowardice and high living of some senior American officials, the author seems less eager to apply his indictment of moral backsliding within the lower ranks. When "heroes" look the other way while their Vietnamese advisees torture other Vietnamese, they seem to lose little of their moral superiority, and the reader is thus left to dismiss either the act or the actor.

Poor copy editing will also frustrate the reader. The author's occasional references to America's earlier wars occasion several misspellings, e.g., "Bastone" for Bastogne (p. 381) and "Craig" for Krag (p. 1064). Perhaps most serious of all, despite heavy reliance on personal correspondence and interviews, Bows is not always content to let the sources speak for themselves, preferring instead to summarize with editorials of his own. Comprehensive footnotes and complete bibliographic entries for the archival sources would also have helped. Their absence, like the absence of an objective purpose, obscures part of the truth: Legends, by definition, are unhistorical, unverifiable, exaggerated stories. Bows' most memorable vignettes, by contrast, are merely accounts of ordinary men caught up in extraordinary circumstances.

JOHN DALEY
Pittsburg, Kansas

Fighting the Desert Fox: Rommel's Campaigns in North Africa April 1941 to August 1942 by John Delaney, Arms & Armour Press, London, England, 1998, 160 pages, 200 b/w illustrations, 16 maps; \$29.95, hardcover.

Is there a need for yet another book on the North African campaign of the Second World War? The exploits of Field Marshal Erwin Rommel and his renowned Afrika Korps have long captured the interest of military historians and amateur enthusiasts alike. In many ways, North Africa was the noblest theater of the war due to the absence of a significant civilian population, occasional chivalry on both sides and exciting sweeps of armored formations against a rather exotic backdrop. John Delaney argues convincingly that there is indeed more to be learned about this important military campaign.

Monographs dealing with the subject have generally focused on either the successes of the British army in North Africa or the abilities of Erwin Rommel. Delaney instead takes a different approach and focuses on the time frame that witnessed the weakest Allied performance, the period that saw the first arrival of substantial German forces under the command of Rommel until the time Montgomery took control of the British 8th Army in August of 1942. Delaney's thesis is not new or controversial. He suggests that the British, under a debilitating succession of commanders, were largely unsuccessful against Rommel because of their ineffective command structure and poor tactical leadership. While Rommel outmaneuvered and outfought the Allies, the various British commanders that faced him never capitalized upon his weakest area: logistics. The British did not achieve real success against the Germans until Montgomery took command and implemented a cautious and deliberate war of attrition. It is not Delaney's thesis that is new but rather his area of emphasis. Delaney does not gloss over the military shortcomings of either the British or the Germans, but instead he devotes greater attention to their respective deficiencies during this often-neglected period of the war.

Each of the book's seven chapters is able to stand as an independent essay in which the relative strengths of the Axis and Allies are analyzed as the North African campaign unfolds. Chapter Four, "Operation 'Crusader,'" which covers the only major British success of the period, is the most insightful of all. Balance is the theme that persists throughout the book as Delaney emphasizes the joint nature of both forces. The alliance of the Germans and the Italians made military cooperation extremely difficult for the Axis, but the Allies arguably faced an even greater challenge due to complications posed by multinational forces. Though allied forces in North Africa were united under British command, there were military units from Britain, South Africa, India, Australia, New Zealand, France, Poland and even Czechoslovakia. For the British to pull together a coordinated effort was a remarkable accomplishment.

A telling example of the book's objective manner is demonstrated by Delaney's balanced treatment of the Italian army — not an easy task. While the military performance of the Italians is justifiably criticized, the author makes clear the consequences of poor leadership and equipment on the fighting ability of otherwise quite capable troops. For his part, Rommel is not spared criticism either. Although Delaney is clearly impressed with the Desert Fox's abilities, the author rightly faults him for becoming carried away with his success and vastly overextending his logistical support.

Overall, the book is indeed a welcome addition because of its novel focus on a less-than-flattering period of British military history even though the larger topic has already received extensive investigation. The book is profusely illustrated with many excellent photographs and good maps, but that does not mark it as simply another collection of photographs geared towards military enthusiasts. The insight and analysis offered make it a work of genuine historical scholarship, something of value to the historian and military professional alike. On the other hand, the absence of footnotes and a bibliography are a serious omission. Other minor factual errors, such as improperly identifying General Friedrich Paulus as "von Paulus," are annoying but do not diminish the importance of the work as a whole. Overall, the work's weaknesses are greatly outweighed by its strengths. Most importantly, Delaney's book ably explains the British failures which preceded the ultimate victory of the Allies in North Africa and helps make clear what later went right for the Allies and what went wrong for the Axis. *Fighting the Desert Fox* is a welcome addition to an important area of military history.

MAJOR KEVIN W. FARRELL
Fort Leavenworth, Kansas

Royal Scots in the Gulf: 1st Battalion The Royal Scots (The Royal Regiment) on Operation Granby, 1990-1991 by Laurie Milner, Leo and Cooper: London, 1998. 185 pages, maps, bibliography, index, glossary; \$28.

Laurie Milner's *Royal Scots in the Gulf* is a dramatic account of Britain's oldest infantry regiment in action during Operation Granby, known to Americans as Operation Desert Storm. Because most of the official British documents relating to this conflict are still classified, the author elected to use interviews and private diaries as the basis of the book. Milner begins with a brief overview of events that led to the commitment of allied forces to Southwest Asia and describes how the Royal Scots deployed there. He then examines the battalion's performance in combat operations and its redeployment to Germany.

According to Milner, the Royal Scots were at a high state of readiness when Saddam Hussein's forces invaded Kuwait. They had recently excelled during several tactical exercises, had high morale, and possessed the most modern equipment in the British Army.

However, the unit soon faced the many logistical and operational challenges of deploying a mechanized infantry force to a combat theater. Vehicles needed to be repainted in appropriate desert camouflage, vehicle crews had to be validated in various gunnery tasks, and the battalion had to make the mental transition from fighting in the restrictive terrain of Western Europe to conducting combat operations in the open desert of Southwest Asia.

Upon arriving in Saudi Arabia, the Royal Scots embarked on an intensive training schedule. Section and squad leaders stressed individual tasks such as first aid, vehicle evacuation drills, and individual marksmanship. Collective training focused on platoon- and company-level attacks, direct fire planning, and breaching operations.

In many ways, *Royal Scots in the Gulf* reads much like a "lessons learned" report from the National Training Center. The battalion had trouble evacuating casualties, navigating at night, and was often unable to integrate maneuver forces and fire support assets. Milner describes the confusion leaders faced when they lost control of dismounted elements during the two hasty attacks conducted by the Royal Scots. Only the strong leadership of noncommissioned officers and the discipline of individual riflemen prevented tragedy.

The experience of these Scottish troops often paralleled those of American units in Southwest Asia. Because of this, the "golden nugget" in Milner's book is not the narrative, but the question the text raises: Have American and British ground forces solved the problems identified during the Persian Gulf War? Although the United States Army has addressed several of these problems at the various combat training centers, a fundamental flaw has been ignored: American mechanized forces still lack adequate radios that provide secure voice communication between dismounted infantry and their carriers. Without this equipment, leaders cannot effectively maneuver their platoons, exposing their soldiers, especially dismounted infantrymen, to an increased risk of fratricide.

Royal Scots in the Gulf is an exciting tale of personal courage under fire by members of this proud regiment. Milner does an excellent job of harnessing the commotion of this short, but violent, conflict as seen through the eyes of its participants. Additionally, it allows today's leaders to reexamine many of the problems experienced during the Persian Gulf War to ensure that proper corrective measures have been taken.

STEPHEN M. GRENIER
CPT, Infantry
Fort Bragg, N.C.

Military Geography For Professionals and the Public by John M. Collins, Brassey's, Inc., Dulles, Va., 1998, 450 pages, \$32.95, paperback.

John M. Collins is a retired U.S. Army colonel who began his 30-year career in 1942 as a private. He later earned a master's in geography. He has also served as a senior special-

ist in National Defense at the Library of Congress and is currently a Distinguished Visiting Research Fellow at the National Defense University. He has written ten previous books, some of which have been translated into five languages. His explanation of the military aspects of physical and political geography is a demonstration of his 56 years of military and scholarly experience.

The author's opening quote is from B.H. Liddell Hart's book, *Thoughts on War*, and states:

"When a Chief of the Imperial General Staff wrote that he had 'never had time to study the details of military [geography]...' it was as if the President of the Royal College of surgeons said he never had time to study anatomy, or do any dissection."

This quote cuts quickly to the major premise of *Military Geography*; the understanding of terrain and its impact on military forces is at the very foundation of the profession of arms. The author identifies three purposes for the book:

- To provide a textbook for academic use
- To provide a handbook for use by political-military professionals
- To enhance public appreciation for the impact of geography on military affairs.

Military Geography does an excellent job meeting these purposes. This is not a book that will provide tremendous insight into OCOKA, but is broader in scope. It is divided into four parts: Part One – Physical Geography; Part Two – Cultural Geography; Part Three – Political-Military Geography, and Part Four – Area Analyses. Part One puts a military spin to what would otherwise be similar to most geography textbooks. The other three sections demonstrate the unique nature of this volume. I found the information about air and naval operations and the geographic constraints to be among the most interesting.

In Part Three, the author explains the history of the unified command system currently used by the U.S. military. This proved extremely useful to understand why the commands have the geographic responsibilities they currently possess and what geographic, political, and military issues may force changes in the future. The final section discusses two specific cases where a geographic area analysis was conducted and how it affected the operation: Operation NEPTUNE (D-Day Landings) and Operation Plan EL PASO (attack to block the Ho Chi Minh trail — never executed).

This book is written like a textbook and, therefore, has some dry portions, but overall it is extremely interesting. The information has importance not simply to civilian scholars or national level strategists, but to Armor/Cavalry soldiers as well. The importance of geography directly influences all military operations — either where they are fought, why they are fought in a specific location, or how each side may conduct operations. I recommend this book to anyone interested in the profession of

arms. It is a great resource and opens our eyes to the importance of all aspects of geography.

Major General Alden Sibley tells us that "...young officers of all services must learn terrain or learn the language of the conqueror." This guidance alone is a good reason to read this book.

CPT BRIAN L. STEED
Fort Irwin, Calif.

The Battle of the Bulge – Britain's Untold Story by Charles Whiting, Sutton Publishing Ltd., Phoenix Mill, Thrupp, Stroud, Gloucestershire, GL5 2BU, 210 pages, hardback, \$34.95, ISBN 0 7509 1869 1

The Battle of the Bulge is remembered in popular history as "von Runstedt's offensive," for the "Battered Bastards of Bastogne," and for Patton's drive to raise the siege. It began with American forces being caught by surprise and pushed back, only to take the offensive and win a great victory. As with many well-known notions, the full truth is not always what people believe. The offensive was the work of Field Marshal Model, not von Runstedt, and while Bastogne was heavily invested, it was never completely surrounded. Patton certainly moved his armies to face the German attack, and indeed started that move before the attack began.

Less well known is the part played by British ground and air forces in the campaign, and the fact that for some time American troops were commanded by Britain's Field Marshal Montgomery. British units, who were at the time resting and re-equipping, were hastily rearmed and moved into action at short notice. However, at the time it was decided for reasons of Allied unity that the Bulge should be thought of as an all-American show, and matters were not helped by the personal and national rivalries of senior commanders and Monty's own style, which may have been strategic but was certainly not always tactful. Thus, Britain's part in the campaign was played down almost to the point where it seemed they were not there. Now matters concerning those who were there have been brought out by this prolific author who took part in the campaign as a young soldier before beginning a post-war career which has seen him produce over 200 military titles.

His account should not be seen as a complete history of the campaign; while the overall picture is painted and some specific incidents told in detail, it concentrates on the part played by Monty and troops under his direction. Some matters are mentioned which will require the reader to look in other accounts to understand them, which still leaves a lot to be covered here. If there is one criticism of this book, it is that it cannot go into great detail in such a small space. To tell the story of those who have not been covered fully elsewhere really deserves a longer work, though the accounts of those at the very top, including Monty and the major American commanders,

will help with a more full understanding of events.

Personal accounts are used throughout to bring the narrative alive, as do some small maps and several photos. Publicity is a theme which is much debated, with brief pen-portraits of American commanders, which may be at odds with the image created and fostered by their own publicists at the time. Matters such as the growing shortage of trained manpower on both sides, friction between the Allies, and considerations of the political leaders highlight themes which should be remembered.

In the end, I found the account did not include enough detail to make it as good a tribute to those who took part as they seem to deserve. However, it may help counter some long-held misconceptions and make the reader look more closely into the events in a new light.

PETER BROWN
Dorset, England

Achilles in Vietnam by Jonathan Shay, M.D., Ph.D., Touchstone, New York. 272 pages, \$13.00 paperback.

Achilles in Vietnam is an eye-opening study of the traumatic effects of combat on soldiers. It is both informative and moving in its vivid descriptions of why soldiers develop post-traumatic stress disorder (PTSD), how their characters are damaged, and how today's military leadership can reduce PTSD following future wars.

Dr. Shay is a psychiatrist whose patients are American combat veterans of the Vietnam War who have severe, chronic PTSD. He sees himself as a missionary, with the objective of preventing PTSD from afflicting soldiers in the future. He currently speaks across the country and writes in professional journals about his patients and their condition. His method in *Achilles in Vietnam* is to "learn about ourselves, using Homer like an ultraviolet lamp to see what is ordinarily invisible." To do this, he alternates between the accounts of his patients and the characters in *The Iliad* to compare what each experienced and the effects it had on their respective characters.

Dr. Shay begins by examining, for both Vietnam veterans and Homer's characters, the ways in which these men were transformed. This provides an explanation of the triggers for PTSD. He then discusses a myriad of factors, including how we view our enemies, deprivation of food and sleep, friendly fire, equipment failure, and attribution of blame. Finally, he explains the diagnosis of PTSD, healing of the veterans, and gives several recommendations.

The great strength of *Achilles in Vietnam* is the detailed, first-person accounts from the veterans themselves. They are shocking. You don't want to believe they are true. Yet, you know they are. In one account, a tanker talks about dismounting his tank to clear the ground around it. A crewmate volunteers to do the task for him and the narrator returns to the

tank. "And [he]'s probably fifteen feet away. And when he jumped, he jumped ... ah-WUH.... He jumped on a mine. And there was nothing left of him. ... And when you're on a tank, it's like a closeness you never had before. It's closer than your mother and father, closer than your brother or sister, or whoever you're closest with in your family.... Because you get three guys that are on that tank, and you're stuck together. You're there. It should have been me. I jumped first. It didn't blow me up. Sa-a-ame spot. Same spot. Same exact spot."

Shay's account is saturated with such reports. He gives the reader a very real sense of what his patients have gone through. Each incident demonstrates a particular cause or effect of PTSD. He further relates detailed accounts of what life is like for these veterans today. These men cannot maintain relationships. They cannot hold jobs. They exist on the fringes of society. This hits home when you come to accept that they have a disorder that came about because of their wartime experiences.

When you read *Achilles in Vietnam*, keep in mind the author's point of view. He has no military experience and sees everything from

his patients' perspective. Several times I started to dismiss his claims as unreasonable. He puts words in the mouths of the unit leadership. He insinuates that the government purposely gave these men faulty equipment. His arguments are one-sided and border on self-righteous. But, remember that those claims are based upon very real accounts from very real soldiers. These veterans believed they spoke the truth. Their perceptions are their realities and that is very relevant.

When Dr. Shay addresses his many concerns about ways that PTSD comes about, he uses a problem-discussion-recommendation format. Many of his recommendations, however, don't serve today's Army terribly well. Most are very general and not obvious in their potential implementation. Two notable exceptions are his recommendation to employ a unit, rather than an individual, replacement policy and suggestions on several methods for handling a unit's grief over fallen comrades. For example, Dr. Shay advocates allowing something as simple as a unit stand-down to commemorate the loss of a soldier. Give the soldier's buddies a chance to say a few words. Let one of the surviving peers accompany the deceased soldier's body to the rear. These acts serve to treat the dead

with respect and allow the survivors to grieve properly. Thwarted grief is one of the potential causes of PTSD.

I have mentioned that the author does not do a great job of making recommendations to today's leaders. Perhaps Dr. Shay is not qualified to do so. However, he is more than qualified to speak on behalf of the thousands of veterans who suffer with damaged characters as a result of their wartime experiences. Perhaps it is *our* job as leaders in today's Army to figure how to solve these problems.

This is not a book to read for enjoyment. This is a book to read for professional development. Once past the shock of the real-life accounts, you will find yourself angry about many things. You will be angry at the situations. You will be angry with these men's leaders. You will be angry with the author. But you will also start thinking of things you would do in your unit now and in the next war to make sure these things don't happen to your soldiers.

STEVE STODDARD
CPT, Armor
USSTRATCOM
Offutt AFB, Neb.

New Game's Realism Makes You Forget Some Limitations

BCT: Brigade Combat Team by ProSIM, \$22.95 (secure credit card transaction) from ProSIM website at www.cchono.com/~pproctor/bct.htm (demo also available at this site).

Requires IBM PC 133mhz Pentium, Windows 3.x or Windows 95, 16 MB RAM, Soundblaster 16 or comparable sound card.

Reviewed on IBM 133mhz Pentium with Windows 95, 48 MB RAM.

Haven't heard of this one? Not surprising. *BCT* is a tactical simulation of modern ground combat based on the Army's Janus simulation. Written by an active duty Army field artillery officer, *BCT* is one of the two most realistic tactical simulations I have ever played. *BCT* stands out for several reasons, not all of them related to game-play: it is sold as a file download over the internet, the author maintains a presence on-line and responds to suggestions for improvement, and it's just a great game!

BCT is a real-time simulation of combined arms warfare. The game pits two opposing forces of up to brigade/regimental size against each other in simulated combat. Just as in modern land warfare, the player fights with and against units consisting of a wide variety

of vehicles. These include armor, infantry, artillery, engineers, air defense, and aircraft.

All Battlefield Operating Systems are present and functional in *BCT*: GSR radar detects the enemy as he approaches, Q36 radar finds his artillery for counter-battery fire by MLRS, VOLCANO minelayers deploy minefields during the battle, FOX NBC recon vehicles detect enemy chemical strikes, tanks with mine plows breach obstacles, etc. The battlefield is a digitized elevation map of actual terrain detailed to contour intervals of 1m for line of sight calculations. Some of the battlefields on which you will fight include the National Training Center, Kuwait, and North Korea.

The learning curve of *BCT* is quite steep, but once you get the hang of the interface, it is quite enjoyable. While it is a real-time simulation, you can pause the action to give you sufficient time to issue orders to all of your units. You can also accelerate time to get to the action quickly. Each scenario begins with an actual operations order, complete with operational graphics and situational template. Scenarios typically begin with the reconnaissance phase of the battle, which is also a nice touch of realism. In the larger scenarios it is sometimes difficult to follow the action, because while contact generates a text message and the appropriate graphics and sound ef-

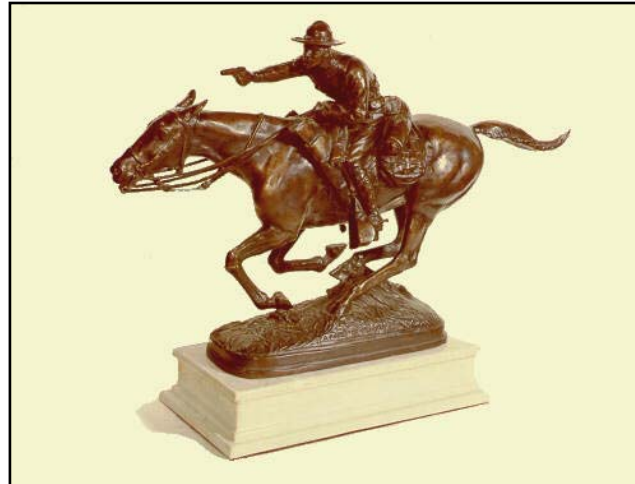
fects, if you are looking at another portion of the battlefield, you sometimes miss events.

BCT's availability over the internet for roughly half the cost of a typical computer game is also an important aspect of the game that I hope catches on. The only drawback is that there is no game manual to sit down and read before or during play. Considering the quality of many game manuals today, this may not be so bad. The quality of *BCT's* on-line help is not as good as the game itself, nor is it complete. This makes finding information awkward. The author has promised a more complete downloadable text version of the manual sometime in the future.

BCT is at best a diamond in the rough at this point; while it is a highly realistic simulation, it has some serious limitations as a potential training aid. It does not have a scenario editor, you can only play the U.S. side, and the scenarios available are limited. The author promises to address these issues in future versions. Once these functions are added, *BCT* has great potential for use as a CPX tool over networked computers. I recommend *BCT* to anyone who wants a highly realistic modern ground combat simulation. It has potential, and is definitely worth the price.

CPT JERRY A. HALL
Fort Carson, Colo.

Draper Essay Contest Offers \$4,000 Top Prize



The Office of the Chief of Armor is proud to announce an essay contest to promote leadership in Armor and Cavalry units. The contest is sponsored by the Draper Armor Leadership Award Fund.

The Draper Armor Leadership Award, which recognizes excellence in Armor and Cavalry, began in January 1924 with the announcement of a similar essay contest in the *Cavalry Journal*, *ARMOR's* predecessor. This year marks the 75th anniversary of the

Draper Armor Leadership Program. To mark this milestone, the Draper Armor Leadership Fund will award \$7,500 to winning essays. The first place winner will receive \$4,000, the second place winner, \$2,500, and the third place winner \$1,000.

The Draper Armor Leadership Award recognizes those Armor and Cavalry leaders who exemplify the ideals of outstanding leadership. Based on this core concept, the essay subject will be on leadership, specifi-

cally, "Leadership in the XXI Century - Digital Age."

Essays must be submitted to the Director of the Office of the Chief of Armor, ATTN: ATZK-AR, Draper Custodian, 1109 Sixth Avenue, Fort Knox, KY 40121-5000, and post-marked no later than 30 September 1999. Essays will be signed only with a pen name. Pen name, writer's name, address, and unit phone number will be enclosed in a sealed, separate envelope attached to the manuscript. The pen name should be noted on the outside of the envelope. This is to ensure anonymity and impartiality. The author's name should not appear on the manuscript or elsewhere, except in the sealed, separate envelope.

The Draper Armor Leadership Trust Fund Council and a committee appointed by the Chief of Armor will judge the essays. The general criteria for evaluation of the essays are organization, substance, style, and correctness. Winning entries will be contacted to inform them of the results. Essays may be published in future editions of *ARMOR Magazine*.

The winners will be presented with a check at the Armor Conference at Fort Knox in 2000. The Draper Foundation will cover the TDY costs and the Office of the Chief of Armor will coordinate the arrangements associated with presenting the checks at the Armor Conference.

RULES OF ENGAGEMENT

- Contest is open to all U.S. Army Active Duty, Reserve and National Guard personnel who are branched in Armor or hold an Armor MOS.
- Essays will not exceed 2000 words.
- Essays must be U.S.-postmarked not later than 30 September 1999.
- Submit essays typed, double-spaced, with a 1" margin, in triplicate, with a font size of 12 or 14, on paper and on a 3.5-inch disk using Word 7.0 or an earlier version.
- Illustrations may accompany the essay.
- The author will be identified on the composition using a pen name.
- The essay must be an original composition written solely for separate publication. (Essays written by an individual author to fulfill OES/NCOES requirements are an exception.)
- Essay authors will not have a copyright in the content of the essays submitted for this contest.
- Essays become the property of the Draper Armor Leadership Trust Fund.
- The essays will not be returned and may later be utilized or published at the discretion of the Draper Board Members.

**ENTRIES WHICH DO NOT CONFORM TO THE ABOVE RULES
WILL NOT BE CONSIDERED**