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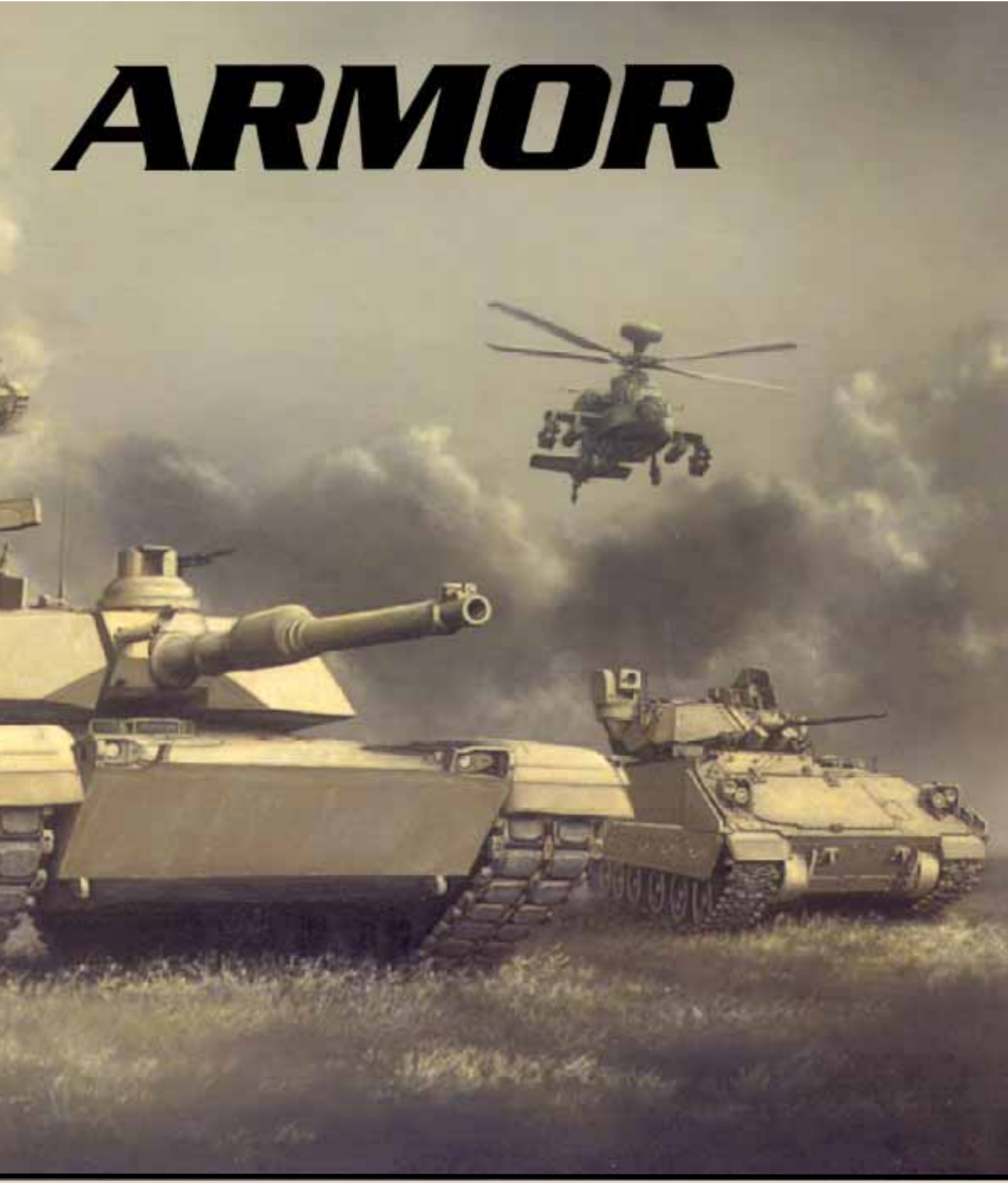

"SPEARHEAD"

PB 17-01-2 *March-April 2001*

Saddle Up... Tonight We Ride

"Daigle, stop! I can't take it anymore! Shut your pie hole and quit complaining! You are killing me with all that incessant whining . . . ." So go the unsolicited comments (minus numerous four-letter modifiers) of one MAJ Rex Awesome, a former drinking partner and self-described "Tanker Extraordinaire." Awesome takes issue with the tone and tenor of my ramblings in **Saddle Up . . . Tonight We Ride**. The gist of Awesome's no-so-eloquent comments focus on my fault-finding in recent columns.

Awesome's verbal assault came during a work day; I was busily engaged with important magazine editor stuff (Don't ask. I still can't explain it to my kids). His tirade caught me off guard, and my response was typical of a 6-year-old: "That's what you think!"

"Why don't you write about some of the good stuff going on out there?" challenged Awesome.

"Why don't you?" I reply, always quick with the snappy repartee.

"Done," says Awesome, "I'll write your damn column!"

Rex Awesome Weighs In: It's damn easy to complain and snivel; too many people occupy themselves doing it for my liking. I suffer fools better than I suffer whiners. Simply don't have time to listen to them bitch and complain, and quite frankly, they make me puke! Let's talk about some things that are right with the Army for a change!

My Top Ten "Good" things about the Army follow:

10) *Dress blues at a civilian wedding.* Who needs to rent a tux?

9) *Physical fitness.* Check out your old high school buddies at the next reunion, but watch for flying harpoons.

8) *Unit coins.* Beats the hell out of a pocket full of business cards.

7) *Firing weapons.* Hard to beat the testosterone rush, and if you enjoy it, you can always bolo and get more free ammo.

6) *The "Star Spangled Banner" before movies.* Don't know how this got started, but like the Pledge of Allegiance in schools, it's a damn good idea.

5) *Mess halls.* Yeah, I know we call them dining facilities now, but they will always be mess halls to me. Simply said, if there is a better breakfast deal around, I haven't found it yet.

4) *TDYs and going to the field.* Sometimes ya' just gotta get away from the wife and kids. (Trust me, they feel the same).

3) *Beer calls on Friday after work.* No one brings Palm Pilots and watches the stock market tickers; we trade for cool Class IX stuff.

2) *Army kids.* Ya can't beat 'em. Moving every two or three years and leaving your buddies can't be easy, but our kids do it well. Doing without a mom or dad for a long time ain't easy either. Army kids face this challenge all the time and thrive.

1) *Not working for a living.* Coming out of college with a degree in drinking, the last thing I wanted to do was work for a living, and the Army has allowed me to avoid that for a long time. Yeah, I don't like being away from my wife and kids sometimes, and not all the Army stuff is fun, but I wouldn't trade it for a wearing a suit and working in the corporate world — that'll come soon enough. Don't believe me? Go to a party sometime with your civilian friends and watch the crowd as Big Ed tells his compelling tale of that sales presentation in Topeka. Compare that to the reaction you get when someone asks you about putting steel through targets, or what Kosovo was like.

Rex — Out!

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

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

0100406

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Features

Departments

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LETTERS

Canister Round Is Long Overdue; HEP and HESH Would Also Help

Dear Sir:

I enjoyed the update on the effort to procure a suitable APERS round for the 120mm cannon ("Proposed 120mm Tank Round Would Regain Antipersonnel Capability," *ARMOR,* Nov-Dec 2000). The requirement for a 120mm APERS round has been ignored for too long. I do not agree, however, with LTC Pride's insinuation that a pre-120mm armed tank was not "envisioned as a tank killer on the open, rolling terrain of Europe." This leads you to believe that the M60-series (and also the original M1) tanks carried a full array of 105mm rounds on board, and that these tanks were not primarily tank killers. Even though each M60A3 in my platoon (3-12 Cav, 3AD) carried a full 56 rounds, all we carried were Sabot and HEAT. The mission was the same, no matter what platform: destroy enemy armor. Table VIII has not changed significantly since then, either.

USFK, and the rest of the Armor force, has always had a need for an anti-personnel munition. Army transformation and the changing operational environment have little to do with the requirement for APERS, as the requirement has existed as long as the tank (or the cast-iron cannon) was confronted with infantry.

On a larger subject, the lack of special munitions makes the M1A1 inferior to the 105mm M1 (or M60) in the infantry support role. Urban warfare is a constant threat that we are not well-prepared for. The 120mm HEAT round, while having excellent anti-armor characteristics, has limited anti-personnel and anti-materiel capability due to the shaped-charge warhead. A simple 120mm HE round, like the M393 105mm HEP (high explosive plastic) or HESH (high explosive squash head), would be much more useful and probably cheaper to produce than the MPAT and other "smart" rounds.

While we're at it, how about designing a 120mm incendiary round as well?

One last suggestion for a new APERS round — best to put a fuze on it to allow long-range engagements. It will be a more flexible munition in the field, and it will be safer to fire over friendly positions. Otherwise, it is only good as a "last-ditch" defense.

CHRIS GINTHER
Washington, D.C.

M1 Ammo Planner Says Users Wanted Only Two Types of Round

Dear Sir:

Kudos on the great article by LTC Dave Pride on the proposed 120mm canister round (*ARMOR*, Nov-Dec 2000). I wish the proponents every success. Nothing is ever certain in this business, but approval of that ORD ought to be a no-brainer. (Funding is of course another matter.)

I was the Project Manager, Tank Main Armament Systems (PM TMAS) who developed the U.S. 120mm ammo family. I think it's worth stressing two points:

- We could easily have developed a 120mm canister round and fielded it with the M1A1. Compared to... KE and HEAT, canister would have been a piece of cake, and if piggybacked on those programs would have been quite inexpensive.

- 120mm canister didn't just slip through a crack. Not developing and fielding such a round was a deliberately taken, strongly held user decision.

The Armor user of that time was wedded to a two-round family, then and forever; there would never, ever be a need for any third round. This was driven partly by the severe reduction (*56 vs 40 rounds. – Ed*) in basic load in going from 105mm to 120mm, but also by a very closed mindset about the future of armored warfare.

At that time, the user wouldn't have accepted canister if it came for free, hand-delivered by the Jennifer Lopez of the timeframe.

At the risk of belaboring the obvious, I hope those responsible for Transformation contemplate this lesson and others like it. Decisions based on a point-solution view of the battlefield foreclose options, and we can ill afford an inflexible mounted force, optimized on restrictive terrain sets and on one or two parameters only.

Keep up the great work!

COL (RET.) DAVID A. APPLING
2d PM TMAS

Range Suitability Should Be Responsibility of Unit's Personnel

Dear Sir:

In the article "Fighting the IDT Tank Table VIII: A National Guard Unit's Solution" (Nov-Dec 2000), MAJ Pryor implies the Master Gunner Branch at Fort Knox is in the business of certifying how units conduct TT VIII on MPRC's. Specifically, he wrote that they had submitted findings of an analysis of the MPRC at Fort Polk "to the Master Gunner Branch at Fort Knox," and that after reviewing this information, a "TT VIII certification nod for the Fort Polk MPRC" was issued. These statements are not totally factual, and imply something that the Master Gunner Branch does not do. These statements also imply that the unit was not qualified to make its own decision on how doctrine should be applied to its training, and debases the abilities of the unit master gunner and commander.

The facts of this matter are that, after its survey of the Fort Polk MPRC, 1st Battalion, 156th AR, of the Louisiana ARNG did submit issues for doctrinal clarification to Fort Knox, specifically the inability of the MPRC at Fort Polk to execute certain engagements on TT VIII. One task was the A4 (long-range moving target), which could not be executed to the range-to-target standard. The issues were reviewed, and guidance provided, by Platoon Gunnery Branch of the Directorate of Training Doctrine Development (DTDD) here at Fort Knox, not the Master Gunner Branch. DTDD's Platoon Gunnery Branch reviewed the issues and responded with a common sense approach. Platoon Gunnery Branch's findings stated that if an MPRC cannot support a specific task, then the unit should execute the task as closely as possible to the established standard. In this case, the A4 engagement was fired several hundred meters short of range-to-target standard.

Many units faced a similar dilemma when the current Tank Gunnery Tables were published in *FM 17-12-1-2,* in May '98. But one has to realize that the current TT VIII and Tank Gunnery Tables were not developed with a specific range or MPRC in mind. The tables were designed to develop and test the proficiency of specific combat skills and tank gunnery techniques, not a unit's ability to execute the tasks on a particular range.

The purpose of the Master Gunner Branch is to train master gunners for the Armor Force, and the business of Platoon Gunnery Branch is to write doctrine for the Armor Force. However, both the Master Gunner Branch and Platoon Gunnery Branch are constantly queried for clarification or interpretation of existing doctrine. In most cases, these clarifications and answers are tempered by the common sense of a master gunner here at Fort Knox who is asked to do the job of the unit asking the question. Neither the Master Gunner Branch nor Platoon Gunnery Branch is in the business of giving a "TT VIII certification nod" to any MPRC. It would be impossible for any unit or agency on Fort Knox to "certify" each MPRC for all the various ways that the Tank Gunnery Tables could be conducted on particular ranges. This action would also take away the flexibility of the unit as to how it executes training.

Units that have an MPRC or range that is unable to meet current doctrinal standards should address this issue to the Army Training Support Center (ATSC) at Fort Eustis. ATSC cannot provide an overnight fix, but can work to develop a solution. Several factors will determine whether this solution is a range upgrade or new range. Units are not expected to train without training resources, and ranges are required to conduct tank gunnery. Remember, problems that are not addressed remain problems.

MAJ Pryor's article details well how his unit tackled the difficult task of conducting Tank Gunnery Qualification with the additional ob-

stacles encountered by National Guard units. Certification or validation of any MPRC's ability to execute TT VIII, or any other Tank Gunnery Table, to standard should be the decision of the unit's commander. The unit master gunner should determine the pertinent issues, and advise the commander accordingly. To relegate this certification or validation to anyone else will undermine the competency of that unit master gunner and commander.

The Master Gunner Branch has and will continue to train each student to the high standards of the Master Gunner Program. Every graduate is capable of providing highly technical training to his unit, and making recommendations to the commander on how to conduct training. Additionally, Platoon Gunnery Branch will continue to write doctrine that enables American tank crews to remain the most lethal in the world. The decision on how doctrine applies and how training is executed should be the decision of the unit commander, with advice from his master gunner, not an agency external to the unit.

SFC IRA L. PARTRIDGE
Operations NCO
Master Gunner Branch
Fort Knox, Ky.

Bradley's Are Too Big to Solve Light Cavalry's Need for Optics

Dear Sir:

I thought SFC Belonus' article was innovative and addressed the major shortfall in the light cavalry scout platoon – its ability to acquire the enemy with limited optics. However, I feel the Bradley CFV is the wrong direction to go as an interim improvement. This adds a 30-ton vehicle that has a large signature and limited deployability on the battlefield for the advantage of ATGM capability and thermal optics. Instead, I recommend taking SFC Belonus' scout platoon concept and replacing the CFV with the German-built Wiesel 2 Light Armored Personnel Carrier.

The Wiesel can mount a 20mm cannon, and can be fitted with an extendable optics mast. Its height (1.8 - 2.1 meters) is not much greater than that of a HMMWV, and it is air-deployable with a CH-47. It has a crew of two and can carry up to five dismounts. As for an ATGM capability, use the Javelin, or the Wiesel 2 can mount a HOT ATGM with the 20mm cannon. This would give the scout platoon added firepower and better optics, yet retain its stealth and deployability.

I have seen LRAS3 mounted on the HMMWV. When are we going to get it right? You have to be completely exposed to use it, and it adds a great deal to the vehicle's silhouette, plus you are now without a primary weapon system.

Both the German Wiesel and the Fennek reconnaissance vehicle have the capability to use extendible optics masts, allowing the vehicles to scan for targets from a hide position with a very small signature. Maybe we should take some lessons from the Germans as we go into our Future Scout Vehicle development.

And for those readers who say "Buy American," remember where the business end of the M1A1 and A2 came from.

CPT ERIC WISHART
HHT Commander
1/221st Cavalry (NVARNG)

Predictive Intelligence: It May Be Difficult, But It's Not Impossible

Dear Sir:

I am greatly concerned by one of the conclusions reached by MAJ Deal and CPT Carter in their article: "Surrendering the Initiative: A Command Decision" in *ARMOR,* Jan-Feb 2001. They said "...that predicting enemy actions and intentions is highly speculative and cannot even begin to be accomplished until thorough reconnaissance is conducted."

To be sure, everyone would like a world where "thorough reconnaissance" can be conducted of everything before every battle. That is not our world. Predictive intelligence is hard, no question. Perhaps the authors have witnessed their share of failures in prediction. However, just because a thing is difficult does not in and of itself warrant its removal as a desired function. Using that logic, the number of failures in battle planning that occur at our training centers would call for the removal of maneuver tactics from our kit bag.

I've been teaching Army soldiers how to do predictive intel for many years now, including three at Ft. Irwin, and I could not agree more with the level of difficulty that the authors assign the task. I also agree that our current doctrine does not do enough to codify the TTP for successful predictive intelligence. However, I am alarmed that the proposed remedy to this situation would be to rescind prediction of the enemy's COA as a primary objective of the intel BOS. This, together with our present fascination with building a picture of the current enemy situation, chips away at what must remain a fundamental skill of the intel soldier: the look into the future.

Waiting until every rock in the AO has been looked under will do as much to surrender the initiative to the enemy as any dangers the authors imagine in prediction. But a fixation on the present leads to a targeting mentality that classifies what of the enemy can be seen into things to be shot, and does nothing to anticipate (the opposite of react to) the enemy and prevent his interfering with our goals.

Predictive intelligence is hard, but eminently achievable. What we need is a thorough look at our teaching methods and our doctrine, both of which are under way at the MI school. As much as I admire Forrest Davis, quoted by the authors, my answer to the question asked in his own 1997 article, "Predictive Intelligence: Do We Really Need It?", is yes. Without it, we either wait interminably for near-perfect recon or plan, prepare and execute without any idea what the future holds.

LTC JON CLEAVES
Senior Military Analyst
Threat Support Directorate

Desert Uniform "Floppy Hat" A Better Choice Than Berets

Dear Sir:

I am interested in the beret debate, even though I retire in June of 2001. I agree with Leonard Wright's comment about berets giving no protection from the sun or other elements. Skin cancer IS on the rise from ozone depletion, as statistics bear out. I offer another alternative to the pith helmet, however. The floppy hat like the one we wear with desert fatigues, but in BDU camo pattern. Here's a hat that you can throw in your duffel bag and it comes out looking fine. It provides 360 degree sun/element protection and also keeps the sun out of your EYES (no small consideration when aiming a weapon or doing any other critical task requiring vision). Another advantage: The elite forces get their well-deserved exclusive symbol back. I know we want to promote one Army, but this is not the way to do that. Are we going to give everyone the Congressional Medal of Honor too?

SFC TOM SMITH
A Co 2-358 AR
Ft. Lewis, Wash.

Threat Expert Says We Goofed In Identifying Russian Tank

Dear Sir:

Your November-December 2000 article "Did the Rebels Misidentify Knocked-Out Tanks?" states the case for reassessing vulnerability of the more modern Russian tanks. Please note, however, that the tank in the accompanying photograph has also been misidentified. Explosive reactive armor (ERA) has been applied to a wide variety of former Soviet tanks, and makes identification more problematic. However, the tank in the photo has Kontakt ERA, and is most likely a T-72BV. The T-72BM is a signficantly upgraded tank with Kontakt-5 ERA, for protection comparable to T-90.

TOM REDMAN, GS-13
TRADOC Threat Support Directorate
Ft. Leavenworth, Kan.

Continued on Page 45

Is Information Superiority All It's Cracked Up to Be?

by Major General B. B. Bell, Commanding General, U.S. Army Armor Center

In the past few Commander's Hatch articles, I've focused on the materiel aspects of the Mechanized Force Modernization Plan and the Objective Force. In this article, I'd like to address the current and future revolution in maneuver warfare, driven by information superiority and operationalized by the dimension of leadership. It's important that we all understand the theoretical underpinnings that will impact combat operations in the near future if we are to dominate combat operations in this changing environment.

Simply put, we know that combat victory goes to the commander who has the most accurate answers to the following three questions:

- Where am I?
- Where are my buddies?
- Where is the enemy?

All land warfare doctrine — strategic, operational, and tactical — is really driven by these three questions. At its most basic level, "Where am I?" addresses geographic location: "Do I have an accurate grid?" As the scope of this question expands up from the tactical through operational to strategic level, it encompasses a myriad of other factors. Morale, logistics, and the combat power status of the forces under the commander's immediate control are but a few examples.

"Where are my buddies?" addresses the condition of those friendly forces that can aid victory. At the tactical level, for example: "Where is my wingman? Does he have line of sight to the enemy formation advancing on our flank?" At the strategic level, it can even encompass an accurate understanding of a coalition partner's political will to adequately support combined military operations.

"Where is the enemy?" encompasses our understanding of every facet of the enemy situation, from location, to logistics, to morale, to combat power. In essence, it means "Do I understand the enemy situation accurately enough to act decisively and win, or do I still need more information?" It is by far the hardest question to answer. Indeed, commanders have been willing, actually forced, throughout history to trade casualties for information about the enemy in a largely attritional approach to war.

With the enemy situation the great unknown, *sequential* operations have been the most common, secure, and effective courses of action to take. At the strategic and operational level, it's been a five-step process:

- Secure a lodgment
- Expand the lodgment
- Build-up the force
- Shape the conditions for decisive operations
- Conduct decisive operations

At the tactical level, the sequence is even simpler, and expressed in all our doctrine, tactics, techniques, and procedures:

- Make lethal contact with the smallest force possible (in order to maintain freedom of action)
- Develop the situation in lethal contact
- Conduct decisive maneuver (almost always including the reserve) to achieve positional advantage and then destroy the enemy in close combat with volume fire.

Unfortunately, this predictable sequential approach takes an inordinate amount of time, gives the enemy a chance to discern our capabilities and intentions, and often yields high friendly casualties. The Allied assault on the Gustav Line in Italy during the Second World War and American operations in the Ia Drang Valley during the Vietnam War provide two historical examples.

In Italy, we knew where the enemy was: well fortified in positions such as Monte Cassino on the Gustav Line. High casualties still resulted, however, because of the necessary Allied sequential approach to the war in Europe. Landing in North Africa and capturing Tunisia telegraphed our next move, the invasion of Sicily. The next obvious step in the sequence? Cross the Straits of Messina to the Italian Peninsula and advance north. Between January and June 1944, the Allies conducted four distinct operations in an attempt to breach the German defenses in central Italy. The landings further up the coast at Anzio did little to expand our options because the strategic die had already been cast. Eventually, the Allies won the Italian Campaign by breaking through the line, linking up with troops at Anzio, and capturing Rome. The Germans also won a tactical victory of sorts, by delaying the Allied advance for five months and inflicting over 115,000 casualties.

Continued on Page 42

The Expert Armor Badge: How It Might Work

by Captain Rick Johnson and Sergeant First Class Michael Carew

Authors Note: At this point in planning, any description of the proposed Expert Armor Badge should be considered tentative. The purpose of this article, in conjunction with the Expert Armor Badge website listed at the end of the article, is to inform the Armor community, and gain feedback, on the Expert Armor Badge initiative. In writing this article, every attempt has been made to preclude reference to specific tasks or task numbers, as the proposed task list is subject to change. However, a tentative sequence of events is included for explanatory purposes.

The Expert Armor Badge: Past to Present

The history of the Expert Armor Badge, or EAB, is long and varied; an Armor badge in one form or another was worn during periods of conflict, to include World War II and the Korean War. These badges were unofficially "awarded" to soldiers in the Armor and Cavalry force but never officially approved and thus eventually faded away. Since the establishment of the Expert Infantryman's Badge (EIB) in the years following World War II, the Armor Center at Fort Knox has several times sought the Army's approval for a similar Armor and Cavalry version of an MOS-specific, individual competency award or skills badge. The EAB proposal was last taken forward shortly after Operation Desert Storm in 1991; it was approved and sent to Department of the Army (DA) level by the Commanding General of the U.S. Army's Training and Doctrine Command (TRADOC). This request for approval stated:

"The ability of armored soldiers to effectively apply speed, mobility, and firepower in close combat, reconnaissance, security, and economy of force operations demands a high level expertise. The unique skills of the tanker and cavalry scout are essential to the effective prosecution of armored combat on the modern battlefield. It is in the best interests of the Army to promote such skills and encourage excellence."

The request for approval went on to state:

"The establishment of this badge will give proper recognition to Armor soldiers and will enhance unit esprit and morale. This award will strengthen incentives while encouraging high professional standards already associated with the armor and armored cavalry scouts."

However, the 1991 EAB proposal was disapproved at DA level on 13 April 1992, in a memorandum stating:

"While it is true that special skill badges are awarded to denote qualifications and successful completion of prescribed training courses, it is neither desirable nor feasible to recognize every such skill with a badge."

Presently, many within the Armor community see a need for an EAB program, to raise the "Pillar of Competence" within the Armor and Cavalry force, build unit *esprit de corps* and branch pride, and fill the void left by the demise of the Skills Qualification Tests (SQT) in the mid-1990s. With that in mind, the Office of the Chief of Armor (OCOA), part of the Armor Center at Fort Knox, is currently developing a mentally and physically challenging series of skills tests that will tax even the best scout or tanker and, most importantly, train all who compete. It is important to note that the intent of this program is not solely to offer yet another "shiny badge" for soldiers to wear on their uniforms. Rather, it should be seen as an excellent opportunity for commanders to train their soldiers on relevant combat-oriented skills according to uncompromising standards. All would be trained, but only the best would be awarded the EAB. This test, although modeled after the Infantry's EIB and the Medical Corps' Expert Field Medical Badge (EFMB), would be Armor-centric with the goal of providing our units with a superb training event.

Test Overview

Much like the EIB, the crux of the Expert Armor Badge program would center on an individual competency, task-based testing event. However, unlike the EIB, each candidate would have to complete a *crew*-based qualification before being allowed to proceed to the *individual* phase of the EAB. A crew event, used as a prerequisite, would emphasize the "crew over individual" concept so important in Armor and Cavalry operations. As this is a program for tankers and scouts, it would not be complete without the inclusion of an event crucial to Armor and Cavalry units everywhere: crew-level gunnery. Prior to completing the individual skills test, a prospective EAB candidate would have to qualify as a member of a crew on an approved Table VIII tank, CFV, or HMMWV. Active duty soldiers would have to complete this requirement up to one year prior to individual EAB testing; Reserve Component soldiers would have up to two years. With this prerequisite complete, a candidate would then be eligible to compete for the EAB in the individual skills competency test.

While the EIB program uses skill level 1 tasks exclusively, the average skill level for EAB tasks would be a bit higher due to the technical nature of the Armor and Cavalry branch. Selection for the proposed task list was unlimited – selected tasks come from skill levels 1-4. As a result, the EAB will be tough but not impossible to attain, although junior soldiers and officers just out of basic training would most likely have to work harder to earn it.

Day 1	Day 2	Day 3	Day 4
APFT	Mounted Land Navigation (Night)	Station Testing	20km Orienteering Course
Individual Weapons Qualification	Station Testing	Retest	Awards Ceremony
Mounted Land Navigation (Night)			

Figure 1. EAB Test Overview

Like the EIB, the EAB test would be administered concurrently over the course of several days (or, for the National Guard, over several drill periods). With current plans in place, the EAB would be scheduled for four days, as in Figure 1.

Day 1: Begins with the Army Physical Fitness Test (APFT) administered per *FM 21-20*. EAB candidates must score 270 or higher in their respective age group. This is followed by Individual Weapons Qualification; EAB standard for progression in this event is Expert, fired with assigned individual weapons (M9 for tankers, M16A2 for scouts, in most cases).

Upon successful completion of these events, candidates proceed to a mounted land navigation course conducted during hours of darkness. To reduce resource requirements for the testing unit, candidates navigate the course mounted on HMMWVs, regardless of the vehicle the unit is equipped with. To further maximize time and resources, each HMMWV mounts four soldiers: three EAB candidates and one evaluator. While the evaluator drives, candidates take turns as vehicle commander, and each has three hours to find three points (one of which is located by GPS). This event should occupy the night of Day 1 and early morning of Day 2.

Days 2 and 3: Constitute the "heart and soul" of the EAB test, challenging the candidate's physical ability and technical prowess. Like the EIB, candidates must complete a series of stations, testing individual competency in a variety of tasks. However, where EIB focuses solely on common task testing, EAB emphasizes tasks that are (in most cases) specific to the Armor and Cavalry force. Current plans split this portion of the test into six stations: First Aid, LP/OP, Mines, Gunnery Skills Test (GST), MOS-Specific Station, and Tactical Operations. To ease command and control requirements and resolution of appeals, stations collocate in the same general vicinity under a central command post, and candidates move in "round-robin" fashion from station to station throughout the day. Tasks at each station roughly relate to one another and follow a general scenario; for example, the LP/OP station tests candidates on tasks associated with the establishment and occupation of an observation post – communications, surveillance, vehicle ID, and sending reports to higher headquarters.

To further differentiate this as an Armor/Cavalry-focused test, three of the stations employ tasks specific to Career Management Field (CMF) 19. In the GST station, soldiers test gunnery skills tasks specific to their vehicle – tank, Bradley, or HMMWV. In the Tactical Operations station, candidates face a tactical situation and must act and react following appropriate Armor or Cavalry doctrine. Finally, in the MOS-Specific Station, scouts and tankers test tasks specific to their MOS; 19Ks test target acquisition and conduct of fire, and 19Ds test route reconnaissance.

Like the EIB, candidates may retest stations they have failed. EIB standards for retesting are used: "A candidate may retest two times, but cannot retest twice at the same station. A candidate who fails a retest or fails at three points is not qualified…" (from *USAIC Pam 350-6*).

Day 4: Concludes the EAB competition with a capstone event — the 20km orienteering course. Whereas EIB finishes with a straight 20km foot march, EAB candidates are challenged to navigate from point to point within a prescribed time period. This event focuses on orienteering, vice the more traditional method of dead reckoning land navigation, as it is more applicable to Armor and Cavalry operations. However, this course is completed dismounted. Upon completion, successful candidates gather in unit formations and are immediately awarded the EAB.

The Way Ahead

OCOA is presently working with several agencies within the Armor Center to ensure that the final task list mandates a high level of expertise and physical ability for the scouts and tankers competing for the EAB. Once the proposal is staffed and approved at the Armor Center, it will be sent out to commanders in the field for their feedback and ideas on improving the program. We also plan to validate this test in the field at Fort Knox with a selected unit doing a "Spur Ride"-type test using EAB tasks. With the data collected during the field staffing and the validation exercise, the EAB program will be ready for submission and request for approval at TRADOC and DA level.

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How Would You Like to Design The Expert Armor Badge?

The Office of the Chief of Armor is asking that any comments, or concerns, or alternate badge designs be sent to the EAB Project Officers below:

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Fax: (502) 624-7585

WE NEED YOUR INPUT ON THE TASK LIST

What tasks do you feel are important? Weak areas for you and your unit? Take a moment and fill out the task survey on the EAB web site at:

http://knox-www.army.mil/center/ocoa/eab/

Armor, Cavalry, and Transformation: "New" Cavalry for the Interim Force

by Colonel Kevin C.M. Benson and Lieutenant Colonel (P) Dana J.H. Pittard

If you don't understand transformation, now's a good time and place to get on board.[1]

On 15 September 2000 at Fort Lewis, Washington, our Army cased the colors of a proud outfit, 1st Battalion, 32d Armor, and reactivated the 1st Squadron, 14th Cavalry. The 14th Cavalry Regiment, born in 1901, first saw action in the Philippines where it conducted limited combat operations and security missions throughout the archipelago, what we would call today Small Scale Contingency (SSC) operations. 1-14 Cavalry is the first in a series of "new" cavalry organizations that will provide reconnaissance, surveillance, and target acquisition (RSTA) for the Interim Brigade Combat Teams (IBCTs). This "transformation" of our Army will take Armor and Cavalry into the 21st century, with these new units conducting traditional cavalry operations — reconnaissance and surveillance — with an expanded focus. The purpose of this essay is to describe the changing operational environment and the organization of the squadron.[2]

Using a borrowed Canadian Army LAV, 14th Cav troopers train at Ft. Lewis.

Changes in the Army's Operational Environment

One of the increasing near-term strategic tasks facing our Army is adapting to a changing operational environment in which SSC operations and not major theaters of war (MTWs) are more likely occurrences. The operating environment for the Interim Brigade Combat Team will be considerably different from the Cold War paradigm of the past. The Industrial Age operational environment in which our Army successfully faced the Warsaw Pact during the Cold War and defeated the Iraqi Army during the Persian Gulf War has changed.

Small Scale Contingency Operations may be the rule as the operational environment moves from the Industrial Age into what has been commonly referred to as the new Information Age of warfare. The U.S. Army has experienced this changing environment, most recently in operations in Somalia, Haiti, Bosnia, and Kosovo.

In the Information Age, the time necessary to make a decision and then to act upon that decision will be greatly condensed. Major regional crises may actually be prevented from expanding into conflicts by quickly deploying a capable American/allied force into theater. Once on the ground, that force must have the capability to conduct a full range of combat operations. Airborne units, while capable of limited light operations, will not always be the answer. An IBCT that can deploy anywhere in the world within 96 hours will be an obvious and welcome addition to the nation's capability to respond to a regional crisis or conflict. As GEN Shinseki said in a recent speech, "The Brigade Combat Teams of that Interim Force bridge the gap in our current operational shortfall between early-arriving light forces and later-arriving heavy ones. Additionally, and more importantly, it will serve as the vanguard of the Objective Force."[3]

In future conflicts, the IBCT will face a much more diverse set of enemies who will be armed with a range of conventional and unconventional capabilities. The IBCT could face opposing information technologies and advanced weapon systems available via global weapons proliferation. The definition of "enemy" solely as combatants of a nation-state's armed forces must expand to include any person, organization, agency, or situation that is, will be, or could be an obstacle to accomplishing the IBCT's mission.[4] The IBCT and the cavalry squadron are capable of operating across the spectrum of conflict. The squadron can operate "as is" in a MTW but would require augmentation if called upon to guard or cover. The squadron can operate without augmentation in SSC operations.[5]

Given the near-term strategic CINC requirements, the IBCT will undoubtedly face a wide range of non-traditional enemies. These potential enemies will employ asymmetric capabilities and tactics intended to neutralize U.S. strengths and exploit vulnerabilities where possible. Our enemies will at-

tempt to operate in unpredictable ways and avoid patterns. The enemy will combine military operations with activities from an assortment of partners from paramilitary units and police forces, to irregular forces and terrorists. Political factions, within or out of government, non-government agencies, transnational organizations, criminal gangs, and even refugee populations may also be factors in these types of operations. It is equally likely that, in some operational areas, military capabilities may not be the enemy's critical capabilities.

Further complicating the range of missions for the IBCTs and the cavalry will be the possible geographical areas in which these potential enemies will operate. Future operations will be conducted in areas ranging from complex urban sprawl to outlying areas of weak infrastructure dominated by inferior roads and bridges. The potential operating areas may not have multiple major air and seaports capable of handling large sealift ships and large aircraft. The need for reconnaissance to gather information and intelligence about the enemy in this environment cannot be overstated.

Squadron Organization

The 1-14 Cavalry, as the first of the "new" cavalry squadrons of the interim force, is organized and equipped to conduct reconnaissance, surveillance, and target acquisition tasks for the IBCT. It is a tough, robust cavalry organization (see figure at right). The Headquarters and Headquarters Troop (HHT) provides the squadron's command and control capability. The vehicles of the HHT form the squadron tactical operations center, a forward command post (TAC), a reduced combat trains command post, and a reduced field trains command post that will integrate with the IBCT Brigade Support Battalion. All vehicles in the squadron will be equipped with FBCB2 (Force XXI Battle Command Brigade and Below). FBCB2 will increase friendly situational awareness throughout the squadron and brigade. The squadron will have the benefit of a Trojan Spirit-Lite, which gives the squadron informational "reach" capability. The squadron also has three retrans teams that, along with other retrans teams throughout the brigade, will help maintain the IBCT communications and digital network.

The reconnaissance (recce) troops are organized for extended operations in a large area of operation. The troops have a small headquarters section, which gives the troop commander the ability to monitor the situation in his area of responsibility, coordinate lethal and non-lethal effects, and conduct limited supply operations. Each recce troop has a three-man FIST team assigned. The troop mortar section has two 120mm mortar carriers and a fire direction center IAV. The troop mortars can mark targets for air-delivered fires, provide immediate suppression and smoke, and illumination for night operations. The recce troop command post also has an operations sergeant (19D30), a senior counter-intelligence NCO (97B30), and an NBC NCO (54B20) assigned. An Air Force TACP team will be attached to each recce troop during operations.

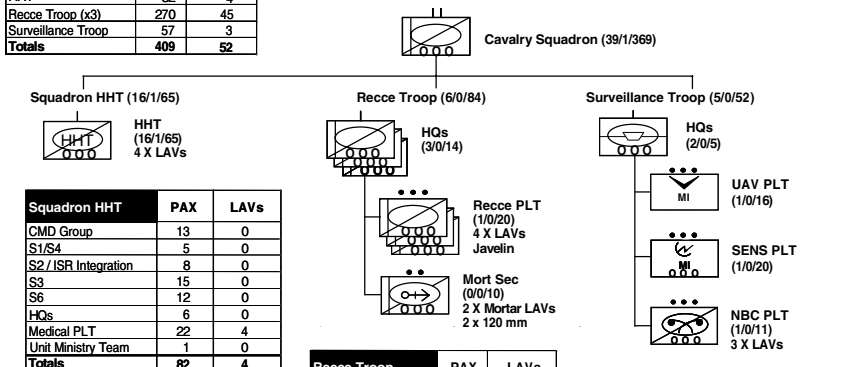
The recce platoons are equipped with four Interim Armored vehicles (IAVs).[6] The platoon has one counter-intelligence trained soldier (97B MOS) assigned to each scout squad. These Human Intelligence (HUMINT) specialists give the platoon additional capability to gather a broad range of information and intelligence. The platoon has four Javelin anti-tank weapons for encounters with enemy light armor. The platoon is capable of multi-dimensional coverage of named areas of interest (NAIs) and can conduct reconnaissance using mounted and dismounted patrols.

The Surveillance Troop gives the squadron commander and IBCT commander an expanded surveillance and target acquisition capability. The troop consists of the troop headquarters, an Unmanned Aerial Vehicle (UAV) platoon, a multi-sensor platoon, and an NBC reconnaissance platoon. The UAV platoon is the "air" complement of the squadron and extends the range of the squadron commander's "eyes" in covering critical NAIs. The multi-sensor platoon has two sections: REMBASS/GSR and PROPHET. The REMBASS/GSR section provides distant and remote capabilities to cover NAIs in all types of weather, day and night. PROPHET gives the squadron an expanded SIGINT capability to intercept and DF enemy communications and provides a platform for future electronic warfare capabilities. The NBC recon platoon provides the squadron the capability to survey industrial sites that could be used to manufacture chemical or biological agents, conducts NBC detection surveys, and provides force protection

IBCT Cavalry Squadron

(02/08/00)

Squadron Roll up	PAX	LAVs
HHT	82	4
Recce Troop (x3)	270	45
Surveillance Troop	57	3
Totals	**409**	**52**



Squadron HHT	PAX	LAVs
CMD Group	13	0
S1/S4	5	0
S2 / ISR Integration	8	0
S3	15	0
S6	12	0
HQs	6	0
Medical PLT	22	4
Unit Ministry Team	1	0
Totals	**82**	**4**

Recce Troop	PAX	LAVs
HQs	17	1
Recce Platoons(x3)	63	12
MORT Sect	10	2
Totals	**90**	**14**

Surveillance Troop	PAX	LAVs
HQs	7	0
UAV PLT	17	0
Sensor PLT	21	0
NBC PLT	12	3
Totals	**57**	**3**

A multi-dimensional approach to reconnaissance expands on the traditional forms of reconnaissance. Troopers must interact with the local populace throughout the area of operations.

through early warning of enemy NBC use.

The interim force cavalry conducts traditional reconnaissance, surveillance, and screening operations within capability. The central task of the 1-14 Cavalry is to provide the capability that permits the IBCT commander and his subordinate units to see and understand the entirety of a multi-dimensional enemy and develop and sustain a thorough understanding of the situation. This capability enables the IBCT commander to dominate his battle space. In fact, the operational success of the brigade depends on this reconnaissance and surveillance effort.

Reconnaissance Operations

Developing an understanding of the situation will require a multi-dimensional approach to reconnaissance that goes beyond the Cold War singular intelligence focus on military forces. A multi-dimensional approach encompasses demographic, social, cultural, political, and economic factors as well as military forces. This signals a return to the traditional focus of U.S. cavalry required in operations against the Indians on the western frontier in the late nineteenth century, to the Moros and Huks of the Philippines in the early twentieth century. The IBCT must have the means to reduce unpredictability, identify critical enemy capabilities and vulnerabilities, and apply its combat power in the most effective manner to achieve operational success. Understanding that the situation begins with developing a broader, deeper understanding of the totality of the operational environment is absolutely essential to the brigade's success.

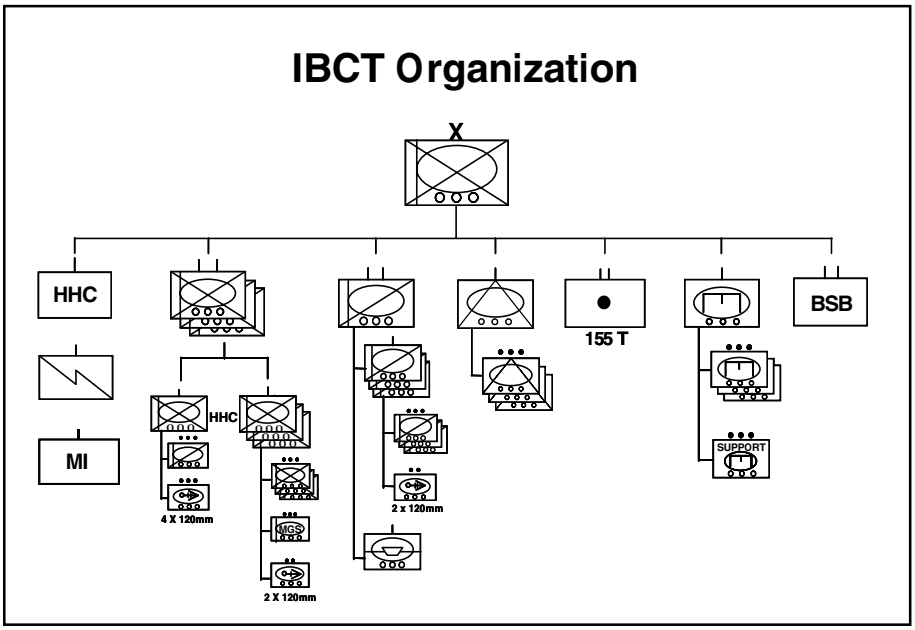
A multi-dimensional approach to reconnaissance expands on the traditional forms of reconnaissance. Troopers must interact with the local populace throughout the area of operations. Understanding human dimensions of the environment (political, religious, ethnic, criminal) are essential for effective decisive action along the spectrum of conflict. Counterintelligence troopers and scouts within the squadron collect and analyze information through contact with community leaders and the local populace. The ability to gain multi-dimensional information and intelligence while conducting traditional zone, area, and route reconnaissance missions will assist in countering or defeating asymmetrical threats.

The squadron must also routinely perform RSTA tasks in urban and other complex terrain situations. Coordinating the air/ground collectors of the surveillance troop with ground recce troops enables the squadron commander to accomplish his primary mission of providing continuous, accurate, and timely information in complex environments. UAVs somewhat mitigate the lack of manned air recce and provide the squadron with valuable air/ground reconnaissance capabilities.

The development of HUMINT assets is particularly important in SSCs. HUMINT assets generate local information, a "street-sense" for the area of operation. Troopers of the squadron must develop the savvy of a "beat cop" or detective, especially in SSCs. The leaders throughout the squadron will learn both the formal and the informal political power structure of the region. They will use HUMINT to develop an understanding of police/secret police/ intelligence agencies, any criminal enterprises, the military and paramilitary structures, the terrain, and the sensitivities of the populace. They must be adept in information collection methods. Like cavalry operations during the UN mission in Haiti, troopers may conduct police-like activities, such as stakeouts. Trooper-based, human-intensive intelligence will balance the limitations of equipment-based sensors.

One of six battalions within the brigade (see figure below), the 1-14 Cavalry has a unique relationship to the other maneuver units. The infantry units are assigned areas, zones or sectors of operation. The 1-14 Cavalry will operate throughout the entire brigade area of responsibility, including those assigned to infantry battalions and other brigade units. The area of operations could range from 50 x 50 kilometers to as large as 100 x 100 kilometers. Actual employment of 1-14 Cavalry will be based on mission analysis. The brigade commander's requirement to see and understand the various aspects of the environment will drive the placement of the 1-14 Cavalry, either into large areas or concentrated in smaller cities. Understanding the situation will enable the squadron commander to focus on the primary mission of information gathering. Accomplishing this task provides other combat and combat support units a common picture of the area of responsibility.

Obtaining valid battle damage assessment (BDA) is an equally vital but difficult task for recon and surveillance units. The use of lethal and non-lethal fires in SSCs as well as MTWs must be precise. Technology coupled with human assessment (scout/counter intelli-



gence) capabilities provide real-time intelligence for targeting with precision munitions or focused PSYOP materials. UAVs and ground reconnaissance can then quickly determine if lethal fires were successful and the extent of any collateral damage. Ground patrols will assess the effectiveness of PSYOP/information operations. UAVs and ground sensors found in the Surveillance Troop also provide early warning that allows the brigade time to anticipate enemy actions by understanding the situation, maneuvering combat power, and making contact with fires or ground forces when and where the IBCT commander chooses. Ground reconnaissance forces and sensors working in tandem with UAVs provide unmatched situational awareness throughout a large area of operations. This situational understanding enables the brigade to anticipate, forestall, and dominate any enemy.

Conclusion

1-14 Cavalry, the first of the "new" interim force cavalry units, is uniquely organized to provide multi-dimensional informational and intelligence support for the IBCT. During the coming years, the squadron will take the first steps in developing tactics, techniques, and procedures, and refinement of the doctrine needed for the interim and objective force. As more IBCTs are organized, other squadrons of the regiment will follow. The 1-14 Cavalry is on the cutting edge of changing the way our Army will conduct warfare in the future. American cavalry has always been a reconnaissance-oriented force, and one that can fight when necessary. These new squadrons will blend technology and trooper into a force that will provide commanders with an enviable ability to "see" the battlefield, be it SSC or MTW.

The organization and intended operational use of the squadron has definite implications on how the squadron will "fight" for information. As shown in the organizational chart and in the discussion of the squadron organization, this is most definitely NOT an armored cavalry outfit. This cavalry outfit cannot stand and fight for information by trading body blows with enemy armor. The intended purpose of the squadron is to gather intelligence information and maintain contact with enemy forces across the spectrum of conflict. Maintaining contact can and must be done using the visual and electronic means available to the squadron commander. The squadron can fight as a part of brigade shaping operations using the Long Range Advanced Scout Surveillance System (LRAS3) as a means of target designation for air- or artillery-delivered fires. In this way, the squadron helps set the conditions for the brigade's decisive operations by maintaining contact and through precise application of fire. The doctrine and tactics, techniques and procedures being written for the squadron must take this type of operation into account. The "new" cavalry of the interim force *is* a robust and tough outfit but it must be used in ways that play to its inherent strengths and not in a manner that will set it up for mission failure.

Cavalry on the American western frontier operated in uncertainty. When a cavalry patrol left its fort, troopers could face everything from natural disasters to stampedes, settler-rancher disputes, to Indian uprisings. Troopers of the western cavalry had to understand their environment, know who the reliable sheriff was, the corrupt Indian agent, the local tribal leaders, as well as the location of water holes and grazing areas. The troopers worked with Indian scouts in the west. The 14th Cavalry worked with local Filipino guides while operating in the Philippines in the early 1900s. The troopers of the "old" cavalry expanded on the traditional forms and requirements of reconnaissance.

The nature of warfare will remain a constant, as it springs from the human heart. War is the realm of danger and uncertainty. War in any form will require courage and commitment. Thus, the trooper of the squadron remains the ultimate guarantor of situational understanding; as he will do what cavalry always does, conduct mounted and dismounted patrols to protect the force. **Suivez Moi! Follow Me! The 14th Cavalry rides again!**[7]

Notes

[1]Speech by GEN Eric Shinseki, Chief of Staff Army, delivered 17 Oct 2000 at the annual Association of the United States Army Convention in Washington, D.C.

[2]The 14th Cavalry Association has a fascinating website. We recommend looking it up at *www.14th-acr.org.*

[3]Shinseki AUSA speech, 17 Oct 2000. The Objective Force is the goal of Army Transformation. The vision is a more strategically mobile Army, with systems of equal or greater lethality than the legacy force, capable of fighting and winning any action along the spectrum of conflict.

[4]This definition of "enemy" is drawn from a presentation developed by the Brigade Coordination Cell (BCC) at Fort Lewis. This is a proposed definition we in the BCC found useful; the MI School has not officially approved it.

[5]We drew heavily on the Interim Brigade Combat Team Organizational & Operational Concept (O&O) final draft dated 30 June 2000. The embedded diagrams within our essay are from Chapter 7, Reconnaissance Surveillance & Target Acquisition (RSTA) Squadron, pages 2, 3, and 26.

[6]We wrote this article before the Army's formal announcement of the type of interim armored vehicle (IAV) selected for the interim force. On 16 Nov 00, the Army announced that the LAV III would be the armored vehicle of the IBCTs. The type of vehicle is not as important as the manner in which the squadron will operate.

[7]We gratefully acknowledge the assistance of the following officers: LTC George Juntiff, MAJ Phil Logan, MAJ Bob Finnegan, COL (Rtd) Duane Hardesty, and the writers of the RSTA chapter of the Organization and Operational Concept. These named great officers gave us their time and advice in the writing of this essay. The writers of the original chapter are unknown to us, but they contributed greatly to the Armored Force and to the Transformation of the Army. Any errors contained in the essay are ours.

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LTC (P) Dana J.H. Pittard is a 1981 graduate of the U.S. Military Academy and is the commander of 1-14 Cavalry at Fort Lewis, Wash. His initial assignments were in 2-63 AR and 3-37 AR at Fort Riley, Kan. He later commanded E Troop, 2/11 ACR; F Company, 40th AR (Berlin Brigade); and D Company, 1-37 AR during the Gulf War. He served as S3 of 1-67 AR and Brigade S3 of 2d Bde/4ID at Fort Hood, Texas. Prior to commanding 1-14 Cav, he commanded 1-32 AR. He has also served as Military Aide to the President. LTC Pittard is a graduate of CSC and SAMS and will attend SSC in 2001.

Deployable Versus Survivable

Israel and Russia have developed heavier, not lighter, armored personnel carriers

by Sergeant First Class Ira L. Partridge

Since October 1999, when Army Chief of Staff General Eric Shinseki and Secretary of the Army Louis Caldera unveiled a "vision for a more strategically responsive"[1] Army, much discussion has been generated on new vehicles and how they will be employed. Discussions about types, capabilities, and doctrinal employment have been interesting, but fail to mention a new class of vehicle. Referred to as heavy APCs, this new class is important when taken with the fact that most Interim Brigade Combat Team (IBCT) discussions invariably mention Mounted Operations in Urban Terrain (MOUT), and, in MOUT operations, deployability does not always equal survivability. This is reflected in recent combat operations conducted by the Russian and Israeli armies in urban environments. If this new strategy is to develop a force that is dominant at every point in the spectrum of operations (deployable, agile, versatile, lethal, sustainable, and *survivable*[2]) one has to ask whether a lightly armored wheeled vehicle is really the right choice when considering combat in urban-like settings. The concept of rapidly deploying lightly armored vehicles to MOUT environments is a flawed one if the populace is hostile.

If the IBCT intends to be a force with a "weapons platform (that has) better ballistic protection" and that can "do what is necessary to protect the force[3]" then one has to again ask if a wheeled lightly armored vehicle is really the right choice?

Picking a Mobile Gun System

Within two months of General Shinseki's announcement, an assortment of vehicles were tested at Fort Knox to determine which would provide the common platform chassis for the IBCT, and which would become the Mobile Gun System (MGS) providing the new unit's armored fist. After several months of testing and debate, a decision was announced in November 2000 that selected the Light Armored Vehicle (LAV) III as the common vehicle platform chassis. A family of ten vehicles will be fielded as the Interim Armored Vehicle (IAV) that is optimized for close, complex, or urban terrain[4] environments.

In contrast, Israel and Russia — two armies that have recently fought in urban environments — instead developed heavier APCs for combat operations in MOUT and mountainous terrain. Both countries developed their heavy APC versions for similar force protection reasons, after experiencing losses while fighting in urban and restrictive terrain. The developments attempted to counter the proliferation of antitank guided missiles (ATGM) and rocket-propelled grenades (RPG) used by fighting forces throughout the world, a situation that has increased the threat level to mounted infantry forces.

Heavy APCs from Israel

Israel learned from combat operations in southern Lebanon that a dedicated, sometimes fanatical, individual soldier armed with an RPG could kill most APCs if he attacked from the side, back, or above. By using guerrilla tactics and a concealed ambush, a single soldier or small group can readily kill an entire squad of mechanized infantry if they are mounted. These experiences resulted in the development of three vehicles capable of protecting, delivering, and deploying a squad of infantry to any point on the battlefield.

The first of these vehicles is the up-armored M113, which adds reactive armor to protect the hull. This modification to Israel's fleet of M113 APCs saw action in southern Lebanon[5] beginning in 1996. The explosive reactive armor (ERA) suite is produced by the Rafa'el Armament Development Authority, Israel's state armament development agency. The concept simply modifies an existing vehicle, giving it enough protection to allow it to operate in urban or restrictive environments with a higher degree of force protection.

The second vehicle, classified as a heavy APC, is based on the Centurion tank hull. It is designated the Nakpadon by the Israelis, and uses ERA and add-on ballistic armor skirting, with the tank turret replaced with a square, built-up crew compartment. A modification allows troops to exit the vehicle from the rear.

The third vehicle is another heavy APC based upon a T-55 tank hull called the Achzarit, which also replaces the tank turret with a crew compartment. To deploy dismounts, the Ach-

Up-armored Israeli M113, at left, has been equipped with explosive reactive armor (ERA) to enhance its protection against the shaped charge warheads of missiles and RPGs.

The Israeli *Nakpadon* heavy APC, right, is a Centurion tank hull with ERA and an armored crew compartment added.

zarit includes a protected clamshell door for dismounting troops from the right rear of the vehicle. This was accomplished by repositioning the engine along the left side of the hull, leaving room for a passage on the right side.

Each of the Israeli heavy APC variants is designed to protect and deliver a squad of dismounted infantry to the battlefield. Its armament of heavy machine guns is consistent with standard APC armament that has been used since the 1960s.

Hard Lessons for the Russians

Russian heavy APC development was based on their catastrophic urban combat experience in Chechnya. Their heavy APCs are in the Russian tradition of vehicles that carry a multitude of crew-served weapons that can be used to support dismounted infantry.

In December of 1994, the Russian Army entered the breakaway republic and attempted to seize the capital of Grozny from the march.[6] The Russian Army moved into Grozny on the night of 31 December and morning of 1 January 1995, hoping to quickly take the presidential palace with few losses.[7] To Russian military leaders, the plan appeared sound and they expected little resistance. It called for an advance on three axes that would meet at the palace.

The main advance along the northern axis had a mission to capture the main railway station located several blocks from the palace.[8] However, when units from the west and east failed to move into Grozny, the units in the north were left unsupported and vulnerable. The battle for the Grozny railway station became a classic example of how not to conduct combat operations in urban terrain, and the tactical ramifications have been scrutinized in many forums. What is important to this discussion is that the 131st Motorized Rifle Brigade lost 102 of 120 armored vehicles to dismounted Chechen hunter-killer teams. Chechen forces were successful for many varied reasons, including their organization of fighting units, dedication to their cause, and the inherent vulnerability of the Russian vehicles they faced.

The Chechen forces in Grozny were organized into combat groups of 15 to 20 personnel, further subdivided into three- to four-man fighting cells.[9] Each cell consisted of an antitank gunner with RPG-7 or RPG-8, a machine gunner, and a sniper. The sniper and machine gunner would engage a vehicle to pin down supporting infantry and keep the vehicle buttoned-up while the antitank gunner would engage and kill the armored vehicle. Teams would deploy at ground level, on second and third stories, and in basements with normally five or six teams attacking a single vehicle simultaneously. Hunter-killer teams would also trap columns in city streets where destruction of the first and last vehicles would trap the column, thus allowing for total destruction of the rest.

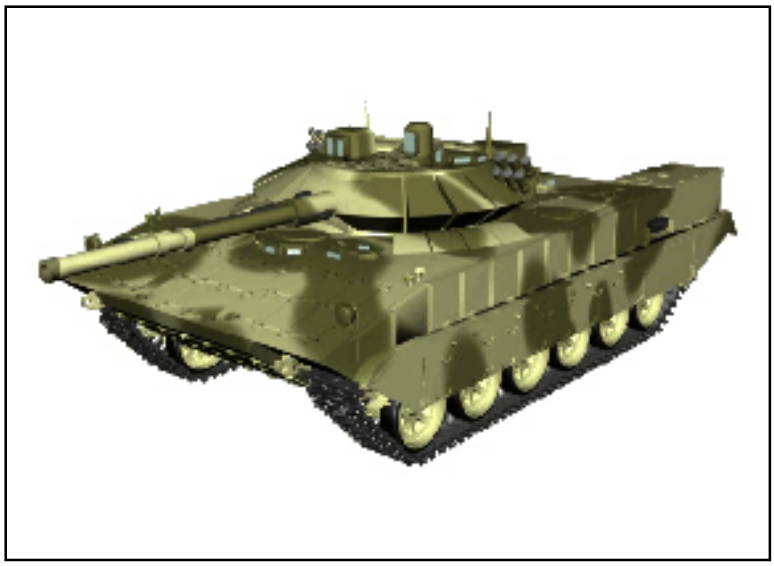
Vehicle capabilities also played a critical role in the debacle. Russian tank guns were incapable of elevating or depressing far enough to be able to deal with these hunter-killer teams fighting from basements and second- or third-story positions, and simultaneous attacks from five or six teams negated the effectiveness of the tank's machine guns. Additionally, ZSU 23-4s and 2S6s — with superior elevation and depression range — which were attached to respond to this threat, became lightly armored priority targets, and were usually the first killed. Lightly armored vehicles such as BMPs, BMDs, and BTRs stood little chance since they could be killed from almost any angle. Tanks fared better, but were still vulnerable when attacked from the side, rear, top, driver's hatch, and any area not covered by ERA.[9]

Russian Heavy APC Development

After the catastrophic losses taken at the battle for the Grozny railway station, the need became apparent to protect motorized infantry elements from modern AT weapons in urban terrain.[10] The result was a joint project from the Design Bureau of Transport Machine-Building and the Transport Machine-Building Plant. They produced a prototype heavy APC called the Bronye-transporter-Tyazhelyy (BTR-T),[11] a T-55 hull-based vehicle with the capability to withstand ATGM attacks on a par with main battle tanks.[12]

The large number of T-55 tanks available were predominately outdated and ineffective, except those already upgraded with add-on ERA and fire control system improvements. They became a resource for conversion to the BTR-T. The most distinguishing feature of the BTR-T is a low-silhouette turret mounted on the tank chassis that is capable of mounting various gun-missile armaments. Protection is achieved by the heavier armor of the tank chassis and additional built-on ERA. The vehicle crew consists of a driver and commander, and has space for five to seven dismounts. Several weapon systems equip the different variants: The BTR-T or H-APC has a one-man turret with the 2A42 30mm automatic cannon and Konkurs ATGM system firing the 9M113 AT (AT-5 Spandrel) missile.[13] The variant with a NSV 12.7mm machine gun is called a Scout-Patrol Vehicle. Other variants include a turret mounted with a AGS-17 automatic grenade launcher or 2A38 twin-barrel submachine gun. The vehicle has its drawbacks. Although force protection is achieved, the BTR-T is too slow to keep up with modern tanks, making it unsuitable for maneuver warfare.

Israeli *Achzarit* heavy APC, at left and above, is based on a T-55 tank hull with the engine repositioned to create space for a clamshell door exit at the rear, as seen in the open position in photo at right.



Upper left, the BTR-T, or H-APC, mounts a 30mm cannon in a low, one-man turret and carries five to seven dismounts. The hull is an obsolete T-55, its protection improved with an ERA suite.

At left is the scout-patrol version, mounting an NSV 12.7mm heavy machine gun. Other weapon systems can also be fitted.

Another heavy APC concept, above, is the BMP-T, based on the T-72 chassis, and capable of much better battlefield speed.

Further development of the heavy APC concept has resulted in the BMP-T, which was introduced as a concept at the VTTV-Omsk-99 exhibition in June 1999, and shown at the 2nd Urals Exhibition of Armaments and Military Equipment held in early 2000 at Nizhni Tagil. The BMP-T is described as a tank support combat vehicle and is a further development of the heavy APC concept, drawing on experience gained with the BTR-T and Chechen combat operations. Designers based the BMP-T on the widely produced T-72 tank chassis. It features ERA on the frontal armor plate, ERA-applied screens to protect side plates, and grilled shields to protect the hull area.[14]

Main armament consists of a 2A42 30mm automatic cannon and coaxially mounted AG-30 or AGS-17A grenade launcher stabilized in two planes. Additionally, it has an AT-14 Kornet ATGM system provided with a semiautomatic jam-proof laser-guidance system. Commander and gunner are equipped with identical PNK-4S sights capable of daylight or thermal viewing and stabilized in elevation to effectively fire all weapons from either position. Additional weapons, arranged on the fenders, include two AG-30 grenade launchers or two 7.62mm PKTM machine guns with an electromechanical drive and day/night sight combined with an Agat-MR optronic sight. A built-in dozer blade can be used for digging in and a KMT-8 tread-width mine plow with EMT electromagnetic device can be mounted at the front of the vehicle. Since the BMP-T is based upon the T-72 chassis, it is better suited to keep up with armored maneuver formations.

Conclusion

The creation of an IBCT type of force has long been needed. However, the concept of deploying the types of vehicles selected for the IBCT into an openly hostile MOUT or restricted environment is flawed. One has to visualize one of the Russian POWs from Grozny that did not know who they were fighting with, who they were fighting against, or what their mission was. They understood their mission as simply an occupation type police action and knew nothing of the combat aspects until their vehicle was shot out from under them.

Tactically, we hope the U.S. Army would never make those mistakes. But understanding the mission and fighting tactically sound doctrine will not stop an RPG from penetrating the light armor of a rapidly deployable vehicle moving into a situation similar to Grozny. The American public would never tolerate losses like those taken in that battle, because we have a much lower tolerance for battlefield losses. The public would never accept losing anywhere near the 85 percent of combat vehicle losses that a brigade-sized unit suffered during that battle.

The LAV III is a good selection for the IBCT because of all the reasons brought forth in the vision statement of GEN Shinseki. But historically, we must remember that Americans have not always been on the cutting edge of vehicle development at the start of combat operations. The success of Desert Storm can be attributed, in one respect, to the capability mismatch between like classes of vehicles. The Army may not need to develop a heavy APC, but to believe the LAV III will fare any better than the BTRs and BMPs did in Grozny is ill-advised. If force protection is a guiding tenet of vehicle selection, then it may not be prudent to use the rapidly deployable LAV III in hostile MOUT operations. Deployability does not always equal survivability, and a vehicle that will not survive on the battlefield is simply a rolling coffin, regardless of how quickly the vehicle was deployed.

This article was meant to introduce Israeli and Russian heavy APCs and to raise the force protection shortcomings of a lightly armored vehicle in hostile MOUT operations, not to second-guess selection of the LAV III for the IBCT. This article was written in the spirit of the famous quote that reminds us that

Continued on Page 44

Cavalry Operations in MOUT

by Captain Scott Schenking

The Armor community has clearly realized that training in MOUT environments is taking on a more important role for our armored teams. Although our armor systems are not specifically designed to operate inside built-up areas, there are tactics, techniques and procedures (TTPs) that can be used to assist in the survivability and lethality of an armored force operating in support of a MOUT operation.

A Troop, 1-10 Cavalry recently completed training on MOUT operations in order to rehearse and refine those TTPs. In the scenario we developed, our squadron conducted a moving flank guard with a small built-up area in its path. Based on the terrain, the squadron was not able to bypass the town. It had to move rapidly past a built-up area without bypassing an enemy force that could influence the division's flank.

In order to accomplish this mission, one troop was to conduct an area recon of the town and establish a bypass through or around the area so that the squadron could continue its mission. We broke this troop's mission down into three phases: reconnaissance; establishing a foothold: and forward passage of lines (FPOL)/urban reconnaissance.

Reconnaissance

The zone recon to the objective can be rapidly accomplished mounted on Bradleys, but this method will likely give up the element of surprise. If time permits, dismounted scouts should be moved into the area to reduce the likelihood of premature contact with enemy forces inside the city. Integration between OH-58D Kiowa armed reconnaissance helicopters and dismounted scouts will ensure a rapid zone recon. Prior to conducting dismounted reconnaissance on the objective, the OH-58D is also capable of conducting area recon of the built-up area (BUA) in order to provide an initial read to dismounted scouts and assist them in moving to effective observation posts.

When conducting an area recon of a BUA, the OH-58D is vulnerable to most small arms weapons firing from well-concealed positions. The OH-58D must stay beyond small arms range and should remain masked behind the last piece of covered and concealed terrain. The OH-58D scouts can provide many kinds of information before the dismounted scouts enter their observation posts:

- Identify positions on rooftops.
- Confirm the street map and identify any changes to the terrain.
- Observe through windows using thermals and identify positions that can observe the approach to the BUA.
- Verify the best OP positions for dismounted scouts and assist in clearing those positions.
- Observe the far side of the BUA and report movement into the BUA.

The OH-58D is limited in its ability to observe deep into the BUA. Unless the helicopter unmasks to gain elevation, it may not be able to observe beyond the initial row of buildings, but it can reposition to multiple OPs rapidly, and may be able to observe down streets between the buildings. However, the aerial scouts will not be able to provide a detailed read on enemy positions within the BUA.

As dismounted scouts enter the area to occupy observation posts around the perimeter of the BUA, they can provide the following initial information:

- Any observed forces that can cover the approach to the BUA.
- The types of structures — frame, stone, etc. — to determine weapons effects.
- Any obstacles along avenues of approach to the BUA.
- Bypass routes around the BUA.
- The best possible positions to gain a foothold for further recon.

Dismounted scout section leaders must be trained on how to communicate with OH-58D pilots during a reconnaissance mission. This relatively simple task of talking in a common language is trained regularly at Bradley commander level and higher, but junior NCOs are not as well trained on this task, and are usually not as familiar with the call signs or the squadron SOPs for communicating directly with pilots. Although the information may not flow as smoothly, units should train junior NCOs to communicate with pilots. This will increase the combat information available and will be critical to successful dismounted operations in MOUT environments. One technique that 1-10 Cav emphasizes has scout pilots landing every so often to discuss the situation with Bradley and tank crews, face to face.

Develop a detailed map for the squadron in order to ensure a common method of describing the BUA. The OH-58D can take digital photos of the BUA and print them through the AMPS computer, but this can be time-consuming. Other approaches are to use local street maps, imagery, or UAV photos. We produced a numerical grid map of the BUA, numbering every building, naming each route, and providing a grid reference system that was specific and more focused for the BUA. This map supplemented the standard military map and provided a common picture of the area before we entered. The map was continuously refined as we conducted our zone recon.

Given this initial reconnaissance, the troop commander should be able to determine the best possible location for penetration as well as ensure that the approach to the BUA is clear of enemy forces.

Establishing a Foothold

If the commander determines that further recon of the BUA is needed, or if an infantry force will be passed forward to clear the objective, then the unit must establish a foothold. This requires synchronization of the combined arms team that is organic to a division cavalry troop. It is the synchronization of armor, dismounts, and air assets that will make for successful MOUT operations.

We approached this mission in the same manner as we would a breaching operation using SOSR (Suppress, Obscure, Secure, Reduce). Field artillery can shape the battlefield by limiting mounted routes that could be used to

reinforce the enemy at the penetration point, as well as by destroying overwatching positions. The OH-58Ds provide accurate grids to targets within the BUA, shaping the initial penetration point. Mortars then provide continuous smoke to cover the penetration area and the initial foothold. A tank platoon was the first element to lay suppressive fires on the BUA. The tanks isolated the foothold by suppressing buildings to the flanks of the foothold and preventing reinforcements from moving to that penetration point. Tanks were capable of standing off at 900m, the maximum effective range of coax, thereby limiting their exposure to RPGs. Tank wingmen scanned for AT missiles while two tanks suppressed the enemy in the BUA.

The mounted scout platoon entered between the tanks and established the point of penetration. The scouts moved forward and dismounted close to the penetration point while the CFVs maintained sufficient standoff to be capable of scanning for targets. The dismounted scouts conducted their attack into the foothold and secured the entire building. Once that building was secure, the Bradleys could move to the far side and destroy any enemy element attempting to eliminate the foothold. At this point, the troop has secured one side of the BUA and is capable of passing a stronger combined arms force forward or allowing the squadron to bypass the town.

While moving from the last covered and concealed position to the penetration point, the dismounts were most effective when following closely behind the Bradleys. Dismounts cannot follow closely behind the M1A1/M1A2 because of the heat of the exhaust. However, they can use the rear of the Bradley to reduce exposure of the M3 while they attempt to dismount scouts near the target area.

The troop must develop a clear direct fire plan for entry into a BUA. The dismounted scouts must know the control measures that the tanks are using so that they can rapidly call for the lifting or shifting of fires as dismounts move through the objective. Armor crews must ensure that they add the height dimension to their direct fire planning in order to cover windows and rooftops. There is a high risk of fratricide in this operation. Armor crews must rehearse jointly with dismounts to ensure that everyone understands the direct fire plan. This is essential to the successful synchronization of dismounts and armor.

The OH-58D was especially useful in preventing fratricide by providing feedback on positions of our own troops. The pilots reported directly to platoon and squad leaders to warn them of dismounts moving into their line of fire. Throughout this phase of the operation, the Kiowa Warriors continued to provide information on movement of reinforcements into the penetration point and assisted in redirecting suppressive fires.

Because of their high trajectory, mortars are highly effective at firing into BUAs. In order to strike a target, the mortars must know the height of the target itself and the height of any building that may block the gun-target line. Scouts must know the location of the mortars in order to rapidly determine the gun-target line before making calls for fire. We recommend using the polar plot mission, assisted with MELIOS and a PLGR. Since target areas in MOUT are small, a difference of 100m could place a round in another block protected by a building — or on your own position!

Urban Recon/FPOL

If the troop is required to make a forced entry into the BUA, then further reconnaissance may not be possible without a larger force. The cavalry troop can assist a forward passage of lines by a combined arms force in several ways. The cavalry troop can establish the initial foothold for the infantry battalion so that they can conserve their combat power for the remainder of the

fight. As the infantry battalion passes forward, the cavalry troop can attach their own tanks and Bradleys to the infantry battalion. The troop can also conduct flank reconnaissance to protect the force as it enters the BUA. The cavalry troop can move to the flank and conduct aggressive zone recon around the BUA in order to assist in isolating the objective.

A cavalry troop is limited in its ability to operate inside a built-up area. Dismounted scouts should not enter a building unless absolutely necessary.[1] Once inside the BUA, the dismounted scouts should move rapidly forward in front of their CFVs in order to clear corners and blind spots. The tank platoon will have to enter the BUA if they cannot provide overwatch from their positions outside of the town.

Techniques for target acquisition in a BUA must be trained before any operation can be successful. Tank crews must remain aware of the limitations caused by their gun tubes when inside cities. Tube depression and elevation is limited, and the length of the gun tube may cause problems when traversing the turret on narrow streets.

The tank loader can assist a crew by keeping his hatch open and scanning for targets above the tank. With his M4 in hand, the loader can suppress targets and assist in directing their wingman into position while still remaining in a relatively protected position. The Bradley is most effective in BUAs because of its short gun tube length and ability to traverse rapidly. A tank and Bradley mix provides a highly effective team in MOUT.

Movement through the streets should be conducted with dismounts forward to clear corners and blind spots. The Bradley should provide immediate protection for dismounts. Its 25mm can penetrate concrete and suppress any target within a BUA. Tanks following the Bradley provide the immediate ability to react to another armored force as well as clear obstacles and destroy bunkers. The tank is especially vulnerable in a BUA. Each tank must be covered by a wingman to prevent dismounts from moving to its rear. Tanks are best left in supporting positions in more open areas so that they can provide their own security and still provide rapid protection against armored forces.[2]

The weapons effects for each weapon system differ and provide distinct advantages when used appropriately. *FM 90-10* describes the effects of each weapon system and should be reviewed before conducting MOUT operations.

Training for MOUT

Training in a MOUT environment for armor companies and armored cavalry troops will increase the flexibility of armor units to understand the impact of MOUT on their units. The training that we conducted was a series of lanes designed to ramp the unit up to a scenario-based, combined arms event. The lanes included driver training, target acquisition, direct fire planning, area reconnaissance, and zone reconnaissance.

Driver training allowed each driver to maneuver through the MOUT site to become familiar with the limitations of the tank. The drivers were required to maneuver at night with some of the street lights still on in order to understand the effect on the VVS-2s. They also rehearsed rapid movement and "berm" drills that included backing up behind buildings.

Target acquisition training consisted of a series of E-type silhouettes placed throughout the city in windows, rooftops, and basements. The crew was timed on acquiring the target and choosing the appropriate weapon system to engage that target.

Training can consist of driver's training through a city, target acquisition lanes, as well as scenario-based lanes which rehearse the cooperation between armor and infantry. The key task to successful MOUT operations is well rehearsed communication at the lowest level between dismounts, armor, air assets, and indirect fire. MOUT operations cannot be successful without synchronization of all elements at platoon level and lower. One of the best resources for preparing for MOUT training is *FKSM 17-90-10, Armor in MOUT*. This short supplementary manual lays out the doctrine and specific techniques to be used in a MOUT environment.

Conclusion

We learned several critical lessons from our MOUT training. First, that armor is highly vulnerable in a MOUT environment. Despite the tactics that we employed to mitigate the risk to our armor forces, they remained at great risk to close-range antitank fire. The best way to mitigate risk is to keep armored forces outside the city, allowing them to suppress from a more secure attack-by-fire position. Another key lesson is that combined arms coordination is absolutely essential to the success of the mission. Units must work together as a combined arms team to ensure that fires and mutual support are provided at the right place and the right time.

Finally, MOUT is a squad leader fight. Squad leaders need to be involved in the planning and rehearsals at troop level. Once an urban fight begins, command and control at troop and platoon level relies upon the noncommissioned officer that is at the tip of the unit's spear.

Overall, training in a MOUT environment has not only enhanced our unit's ability to operate in this difficult type of terrain, but has trained many critical combat skills. MOUT teaches combined arms coordination, the flow of combat information, and tactical leadership at the lowest levels. Without these critical skills, MOUT operations will not be successful.

Notes

[1]*FKSM 17-90-10, Armor in Military Operations on Urbanized Terrain (MOUT),* April 1990, Chapter 7.

[2]*FM 90-10, Military Operations in Urbanized Terrain,* August 1979.

CPT Scott Schenking holds a BA in Business Finance from Loyola College, Baltimore, Md. His military education includes the Armor Officer Basic Course, Scout Platoon Leaders Course, Battalion Motor Officers Course, Armor Officer Advanced Course, Combined Services Staff School, and the Cavalry Leaders Course. He was assigned to 1st ID at Ft. Riley, Kan., from 1993-1997. While assigned to the division's cavalry squadron, 1-4 Cav, he served as assistant operations officer. Following the reflagging of the 1st AD, he served with the 1-37 Armor as tank platoon leader and with the 1-13 Armor as C Company XO. He concluded his tour at Ft. Riley as the aide-de-camp to the assistant division commander for maneuver. At Fort Hood, he served as the plans officer for the 4th Aviation Brigade, 4th ID (Mech), the 1-10 Cav Squadron assistant S3, the squadron S4, and as HHT and A Troop commander. CPT Schenking departs command for Dutch Language training in Washington, D.C.

Hacking Our Way to Victory?

An American Weapon for the 21st Century

by Major Robert Bateman

"Revolution in Military Affairs": A fundamental change in the nature of war occurring in a relatively short period of time, stemming from changes in organization, military doctrine, economic/social/political factors, or technology.[1]

This article explores some of our current definitions about war and military affairs. By addressing a few simple questions, such as, "What is a weapon?" we may come closer to determining the real strengths of the United States. We may realize that our true potential as a nation, and by extension that of our military, lies not in the fact that we have the most main battle tanks, but in the fact that we have 45 million children who are perfectly comfortable using 700 MhZ computers to play games. The "revolution" that the United States is widely suggested to be leading in military affairs may have less to do with our expensive net of intelligence tools and precision missiles, and more to do with the fact that our country is so technologically saturated that we have more than a million people who consider themselves "hackers."[2]

Many of the historically minded suggest that we may have, over the last fifty years, re-entered a period of "limited war" such as existed in Europe during the seventeenth and eighteenth centuries. Although at this point the Army still lacks an official definition of what a war is, and by extension what a war is not, we continue to wrestle with the idea. The irony is that we already have several modifications and refinements of the concept of armed conflict (high, low, medium intensity for example). At the same time, we are at a loss to adequately explain the vast realm of activities that take place short of declared war but in the absence of peace.[3] If we, the military forces of the United States, are not considering these issues in any sort of organized manner, who is? In another article, I suggested that we define war as,

"The state that exists when one polity publicly commits to prolonged and significant violence upon another polity in order to force it to accede to its will."

Given our difficulty defining even such a simple word as "war," perhaps we need to re-examine our other definitions, such as that for "weapons." In undertaking such a fundamental reassessment, we need to examine a basic idea: what is the intended end-state that we create "weapons" to achieve? We design those things that we refer to as "weapons" to destroy things, but their purpose in doing so is to compel. (That is, if we accept that the purpose of war from the American viewpoint is not destruction for destruction's sake but compelling another to accede to your will through the use or threat of the use of force.[4]) Thus far in human history, the most direct method to force another polity to accede to your wishes was to physically destroy so much of the things that they valued (be it human life or property) that they were convinced that the balance and momentum of the war were not in their favor (and therefore future prospects were bleak) and their most logical act was surrender and/or a negotiated cessation of hostilities. This concept is the foundation to our modern perception of what "war" means. But what if there were another route to threaten the things that another polity valued, even human life, without committing direct physical violence. Is that war?

"We may realize that our true potential as a nation, and by extension that of our military, lies not in the fact that we have the most main battle tanks, but in the fact that we have 45 million children who are perfectly comfortable using 700 MhZ computers to play games."

Download and the Lord of Destruction

D/L and L.O.D. wandered through the cavernous convention center in a daze for the first half of the day.[5] *True, each had been to numerous sites offering the "virtual DEFCON" tour before, many times in fact, but actually being at DEFCON was different. For the first time in either of their young lives they were truly experiencing sensory overload. Nothing before this had ever excited their interests in quite the same way. Frankly, nothing "IRL" before DEFCON '04 had much interested them at all.*[6] *They, like roughly two million others in their age group, were children of the wired world.*

Wandering from booth to booth, they salivated over the goodies displayed. Laptops with gig chips were the latest rage, though the potential speed advantages of the conventional desktops were tantalizing as well. Yet for all the hardware and "straight" software available on the floor at all hours, it was the "sub market" that held the most attraction for both of them. Both were self-declared hackers, and for them the DEFCON was just short of Mecca.

Turning the corner of yet another row of vendors they ran straight into a sight they would not have believed if they were not seeing it with their own eyes.

For years, the U.S. Department of Defense had taken to setting up a booth at DEFCON. Mostly these contained staid literature and descriptions of lame work at pay levels that were (for IT specialists) the equivalent of slave labor. Even the language used for most of their older hardware systems, ADA, was an antiquated beast. Moreover, the word had spread, top-down control and authoritarian bosses were not elements in the favored environment of most of the industry. The D.O.D. had become something of a joke at DEFCON in the past few years, relegated to a corner booth on a dead-end traffic lane in the convention floor layout.

What faced D/L and L.O.D. now was nothing like what they'd heard about Department of Defense displays of previous years. Smack dab in the middle of a high traffic lane at the epicenter of the convention midway stood a flat black cube, eighty feet on a side. Nothing on the outside gave evidence of the purpose for this massive block. On the side of the box, in black lettering of a

slightly different pitch there were the letters, in lower case, "d.o.d.," and nothing else. A single passageway stood available for entrance into the cube. Standing in line awaiting entrance to the cube, as though it were the Grotto of Bethlehem or perhaps more appropriately the entrance to the Borg, were no fewer than four hundred of their peers. Resistance was futile. Without a word they both got in line. No questions were asked, and none had to be.

Two hours later they gained entrance. The passage alone met all of their expectations. No signatures, no social security, no personal information…a digital thumbprint and retinal scan in a foyer just inside the entrance and then nirvana. Spread before them were desktops and laptops and piles of CDs, each in a discreet cubicle. Entranced and stunned, they moved forward and separated, each to his own cubicle.

The second that each sat down in their ergonomic chairs there appeared simple words on the screens of their flat screen monitors, words that spoke to every fiber of their 19-year-old souls.

"this is d.o.d."

"this system has never been cracked"

"break in and you may join"

"your qualification will only last one year"

"details to follow…if you succeed"

The screen blanked. It appeared that the system rebooted, when it came up again a standard boot sequence started and offered them their choice of operating systems. D/L chose a Windows environment while L.O.D. picked Linux. When the boot sequence completed there was arrayed for them on the desktop the most comprehensive cracker library either had ever seen, and nothing else.

Like many of their peers neither of them would leave for more than 16 straight hours.

In the sixteenth hour, L.O.D. left. He was tired, had not bathed in more than 36 hours, and wanted to see some of the fabled sights of Las Vegas. Twelve minutes later D/L made it in. His screen went black again.

"yes"

Six seconds later a bald man of indeterminate age wearing a black suit and sunglasses appeared at his shoulder. "Will you come with me sir?" the man asked. D/L, somewhat numbed by the emotional high of the crack and the physiological drain of the time and attention quietly left with him. As he walked out, he saw a young fresh face moving through the entrance portal to the chair where he'd been… "this is dod" said the screen.

D/L moved zombie-like behind the silent and implicitly sinister agent of the government, for now it appeared that reality would bend to meet expectations. In a second room, a much smaller room within the cube, he came to rest on one side of a table. There were two chairs to the table. On the table were a keyboard, a pad and a screen, and a tablet of paper, a simple contract. It was frightening in simplicity. In return for one year of allegiance to the United States, it promised access to the best technology in the world…for one year. The language was that plain, and that alone was frightening in its power. The man in black said, "You have two minutes. Do you have any questions?" When D/L shook his head the man immediately turned and left the tiny cell.

Seventeen seconds later D/L signed his name, placed his eye at the retinal scan portal, and joined, whether he knew it or not, the Second United States Cyber Corps.

An hour after D/L got back to his dorm at Caltech there was a knock at the door. Three men in black suits stood in the doorway. Around them were a host of boxes, at least twenty of varying sizes, all of them flat black, all stamped "dod" in black lettering. The tallest of the men in black held out a computer clipboard. Upon the screen all it said was "Equipment received." D/L pressed his thumb to the screen and the men left. Inside the boxes were the wet dreams incarnate of every technophile in the world and a note. "Installation of hardware: You. Network installation Tuesday, 2100."

D/L was instantly a celebrity across the entire campus, despite the fact that he was a freshman. On the entire Caltech campus, only five people had received similar deliveries, and everyone knew within hours who they were, two professors and three students. Word on the street had it that their arch-rival, MIT, had only four packages delivered and backbone connections installed; the rest were assumedly scattered across the nation.

By the end of the week, thirty people had been identified as having received the ominous packages across the country. All of these had been to college campuses or in a few cases to high schools. Rumors, especially ones about legendary cracking episodes, spread fast. In this case the rumors were constantly fueled by more hard facts. Over the course of the following year, the identity of only four more people that had managed to crack the "dod" would come to light, but by that time the pattern would be set.

D/L was, he soon learned, one of the '25,' the top half of the fifty that had succeeded in breaking in during DEFCON '04. Though neither he nor any of the other top half would reveal the specifics of what they had been asked to do, leaks were part of the process. D/L wasn't getting paid, in the conventional sense. He was richly rewarded in the currency he most valued though. He was now a de facto celebrity, a superstar in the only community that mattered to him. As one of the '50,' he had what every hacker seeks, bragging rights that won't bring the Department of Justice to your front door at six in the morning. He had hacked 'dod' and only 50 others had been able to do that in the time allotted. He was, by everyone's account, one of the best.

What he had been asked to do in return for the equipment and access, collaboratively with the others when possible, alone when he felt the need, was to design the environment to be cracked at DEFCON '05. That's all. He could work on the challenge when he wanted, in any way that he wanted, using any language he wanted. Total creative programming freedom. It became a labor of love. Twenty-five Doctors Frankenstein worked together over a year. Significantly, these were the better half of the '50.' They created a monster, surely no one could crack it. Over the course of the year, most of the buzz and tech-media attention focused on this half of the group. Nobody was quite sure what the other half was doing, but by most accounts it amounted to some simple contract work…

When D/L arrived in Las Vegas for the start of DEFCON '06, he was accustomed to celebrity, yet for all that he was somewhat apprehensive. Last year he and the others from "The Fifth Deviation" (another nickname for those of the top '25,' derived from the fact that it was estimated that they were five standard deviations above the "norm" in programmer and/or hacker skills) had been barred from entering the cube. Although those from "the fourth" had been allowed to enter with the rest of the applicants, everyone was waiting

to see what would happen this year when a "fifth" tried to gain entry.

When the first of them reached the front of the line last year (a line that was twice the length of the one in '04), one of the ubiquitous-but-silent MIBs stepped out of the portal and quietly barred her way. That was enough. There had been no explanation, nor warning, but none of the 25 protested. To do so would have been against their own emerging code of conduct; besides, they expected this. They assumed, correctly that they would only be allowed in the next year…"

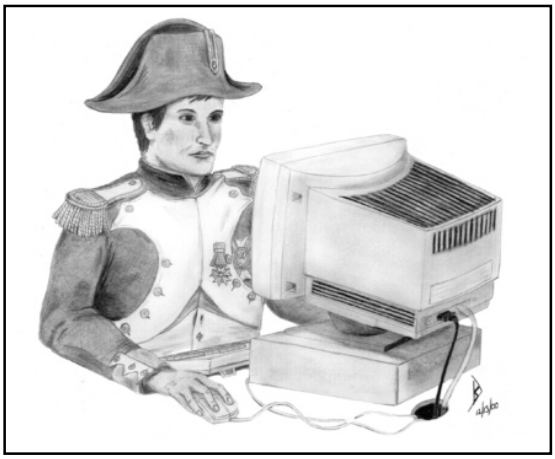
Although this story presents an obviously fictional sequence of events in the near future, and portions of the acts recommended may well be patently illegal under current legislation, the story presented above serves as a useful illustration of several concepts. D/L and L.O.D., although fictional, are fairly typical depictions of a subculture that has few common denominators beyond a profound distrust of the government, and specifically the military. The irony is that they simultaneously represent both a significant threat to our computer infrastructure integrity as well as our greatest potential resource. What if the United States could tap into those million hackers we produce? What if we established a process, a meritocracy, where the technology and the hacker subculture itself worked to continually strengthen our information technology lead? D/L is part of that process, as each year the best of the best spend a year creating an even tougher "d.o.d." site to be cracked at the next DEFCON, thus creating a sort of virtual "natural selection."

The lower half of the top fifty is asked, but significantly not "hired" and not compelled, to undertake a whole host of assignments. Some, in fact most of these, are entirely benign. The tasks themselves are selected by psychologists to lead these individuals to arrive at certain conclusions. They may get a file folder filled with a few articles from the *Washington Post* and the *New York Times* on recent changes in China's attitude towards the internet. There may also be an article or two about Tienamen Square for "background," and perhaps a few explaining Mao's "Great Leap Forward" (and the thousands killed in that process) so that the individual knows something about the people that design the systems they are asked to explore. That is all that they are asked to do, explore the computer infrastructure of, say, China. Of course, it lays the groundwork for so much more… in fact, it might really reflect the true nature of the current "Revolution."

To understand some of this, however, we must look backwards.

The Napoleonic "Revolution"

Napoleon Bonaparte is credited by many with a military revolution all to himself, the "Napoleonic Revolution" of the beginning of the 19th century. It is not overstating the case to say that from roughly 1796 through his final defeat at Waterloo in 1815, Napoleon's system of warfare reigned supreme.



Art by SGT Benjamin S. Ormand

That is, all belligerents, if they maintained any hope for success, either had to adopt some aspects of the Napoleonic system, or develop tools of their own to counteract that system. In either case, even after the apogee of the French Empire passed, all belligerents were in a reactive mode in relation to the empire of Napoleon. For a long time, especially in military circles, the "Napoleonic Revolution in Military Affairs" was credited to Napoleon himself.

I suggest, however, that Napoleon was merely the right man at the right time. For all his genius, Napoleon was arguably just a good jockey riding the best horse in town. The question then becomes one of trying to figure out what made the horse so damned fast, not why was the jockey winning all of the time.[7] What then was the basis for the phenomenal French success during this era? To answer that, and pull a little wisdom from history, requires some understanding of the Napoleonic system.

The components of the system have been studied and dissected for more than two hundred years. The two major factors that contributed to Napoleon's success were his relative velocity in comparison to his opponents at all levels of warfare and the size of the forces he could field. Speed and mass were the central elements of the Napoleonic game, and they were achieved through several interrelated changes.

Speed

Speed, being on the enemy before the enemy could prepare for battle, was Napoleon's earliest advantage. The French achieved this speed through some doctrinal adjustments adopted by Napoleon. One of the best known was the use of the corps structure and the deliberate movement along several parallel routes as a means of increasing the speed of the overall army. Napoleon referred to this as the *Battalion Carré*.[8] He used the formation to famous effect in 1805 during the Ulm campaign and the next year during the campaign against the Prussians that ended in the dual battle of Jena-Auerstadt. Yet this operational maneuver formation required something that the armies of Napoleon's opponents did not initially have in their toolbags, which is why only Napoleon could move with such a great relative velocity. It requires a competent officer corps. The doctrinal concepts had existed for some time before Napoleon put them into practice, but it required a social change for an army to be capable of executing the ideas.

The French officer corps of the Napoleonic era promoted upon merit. Numerous historians have pointed to the early siege of Toulon in 1793, when Napoleon was a mere artillery captain. During the course of that siege, he came in contact with several other French leaders, common soldiers who would within little more than a decade be generals or marshals of France.

These were men such as Jean Junot (a sergeant who becomes a general), André Massena (an ex-smuggler, and former company sergeant, who becomes a marshal), Auguste Marmont (who started as an artillery sergeant, was a major at Toulon and would become a marshal), Claude Victor (the infantry sergeant who leads an assault at Toulon, and will later become a marshal),

and Louis Suchet (who starts out as a common soldier).[9] In the French army, men earned their positions primarily (though admittedly not entirely) through the demonstration of their abilities; this was especially true in the earliest days of the Republic. While other armies of the day permitted the purchase of nearly all ranks, with the attendant inconsistencies of quality, the French system found the best and elevated them. Without this system, the operation of independent columns operating under guidance (as opposed to restrictive directions) would likely fall apart under pressure of enemy contact.[10] This raises the obvious question, if merit-based promotion is so advantageous, why were the other nations of Europe incapable or unwilling to use this system?

On a similar theme, the French achieved speed through their reversal of the traditional methods of logistic support. Foraging while on the move is considerable less resource intensive and comparatively faster than support by wagon train from the rear. While the armies of the "Age of Limited War" that preceded Napoleon's relied upon an extensive system of supply bases and created a logistics tail that stretched from the area of tactical operations all the way back to the strategic center of that nation, Napoleon relied primarily upon foraging.[11] This was another reason for the dispersal of his forces: it took a considerable amount of territory to support a corps, or an army on the move. Were he to move along a single route, the surrounding territory would be stripped clean by his lead corps, leaving no alternative for the following corps but to rely upon logistics pushed from the rear.[12] By using multiple avenues, he spread the logistic burden across a broader front.

The great advantage in speed that the French enjoyed due to their use of a logistics system based primarily upon foraging was also dependent upon social changes, in this case the effects of nationalism. Soldiers of revolutionary France, motivated to fight for the new idea of the French nation, an idea that they participated in, were generally less prone to the great bane of the royal armies of the era, desertion. This is an important idea, especially if one hopes to allow large numbers of soldiers to disperse across the countryside with very little "loyal" (read officer) supervision in search of provisions. Thus, the true change that enabled the French shift in logistics, and therefore aided in their increase in relative speed, was not a change in technology, or even a change in the military organization itself, it was a social concept which came about with the French Revolution.

Yet this also was not an original idea of Napoleon's, merely one that he was in the unique position to put into operation.[13] Again, if foraging was so efficient, why was Napoleon the only one using it at first?

The answer to both of the questions posed above is that none of the other nations were prepared socially. This was the end of the age of absolute monarchies, but they would not go easily. They were not willing, or were unable, to effect the same changes within their societies as had the French and therefore could not execute the same changes. Remember that the definition of a "Revolution in Military Affairs" espoused here encompasses changes in technology, organization, doctrine, or social/political/economic factors. It was, in fact, the social changes brought to the front by the French Revolution that was at the root of the "Napoleonic Revolution."

The whole mess is intricately knotted together. For example, the aforementioned use of independent corps formations, one of the key elements to the success of Napoleon, was itself dependent upon the existence of competent officers. The mass of competent officers could only be provided by a system of merit based promotion. Merit promotions were only possible in 18th Century Europe in a nation that embraced the ideas of equality and egalitarianism. At that time, this was found in only one nation, revolutionary France. So as we can see, the whole issue of "Speed" comes back not to the "genius of Napoleon" but to the social changes wrought by the French Revolution.

Mass

The second aspect that made Napoleon's armies what they were was undoubtedly their size. Napoleon himself was famously quoted as claiming that God was on the side of the largest battalions. By extension, one could say that this extended to the size of the army overall. Napoleonic armies ballooned in size. This was not only because of the influence that new motivations such as nationalism had upon the common man, but because the state finally organized itself to more completely mobilize the people. One man gets the lion's share of the credit for making that happen, Lazar Carnot.

As the head of the "War Section" of the revolutionary French government, Carnot had great power. He was, for all intents and purposes, the man that created the weapon that Napoleon wielded to such great effect. Carnot was the man that reorganized the chaotic mess that the French military had become in the wake of the Revolution. Remember, all the French officers used to be noble prior to 1789. Imagine an army where 90 percent of the officers just quit one day and you have some idea of the scale of the administrative nightmare facing Carnot. More important even than that contribution was his organization of society.

France, by population, was the largest nation in Europe. The issue then was not one of a lack of bodies, it was a total lack of a system to get those bodies into uniforms. For all intents and purposes, Carnot is the father of the modern draft. It is his implementation of the *Leveé en Masse* that brings Napoleon's field army strength up to the half million mark and beyond again and again for nearly twenty years. (The total army strength might reach into the millions. Not a bad record for a pre-industrial society.) Carnot truly earned his nickname as the "Organizer of Victory." The question that this lesson in Napoleonic history leaves us asking is, who is our Carnot today?

Conclusion

Perhaps we need not worry over much this year or the next on the exact structure of the IBCT or whether the next armored vehicle will have wheels or tracks. Maybe the present day infantrymen who are panicked because some idiot is trying to foist a 22-pound rifle off on us are worried about the wrong issue. Our real strength, as an Army and as a nation, may not rest in the mere weapons that we are using today, just as Napoleon's real strength was not really a military strength at all, but a social one.

None of this is to suggest that we abandon the field of battle. Tanks, attack helicopters, field artillery, and infantryman will have a role in war so long as man retains the willingness to attach a rock to a stick and bash in his fellow man's skull. That will not go away. What we are seeing, however, is a new aspect to the violence. We are seeing, potentially, a subtle new way to destroy your opponent, one that we in the United States are uniquely positioned to exploit. We have the human potential to execute this in a way that no other society does. We practically

breed the type of behavior that produces hackers. Harnessing that energy would represent a true American advantage, one that cannot be simply copied by another nation unless they become just like us. Something that many are unwilling to do.

The "Napoleonic Revolution" did not originate inside the military; it was merely the military taking advantage of a social difference that existed between French society and the rest of Europe. This article suggests that the real benefit of our current "military revolution" has yet to be recognized and capitalized upon. Our national edge stems from the fact that in this country every single six year old, regardless of economic strata, has used computers more powerful than all five of those that took the original Space Shuttle into orbit. (Think about how much computing power is in the standard Nintendo 64.) The fact that we probably have more than a million kids in this nation capable of breaking into moderately secured computer sites should not be viewed as a threat by the Department of Defense… it's our greatest national weapon! We just have to figure out how to aim the damned thing.

Notes

[1]Robert L. Bateman, "Preface," in *Digital War, A View from the Front Lines*, Robert L. Bateman, ed. (Presidio, 1999), viii-ix. This definition itself is derived from that in use in the Department of History at the United States Military Academy and was the joint creation of several officers and historians.

[2]The growing opinion among both our allies and those that may be our competitors is that the current transformation of war that most acknowledge is underway is an almost uniquely American phenomena. This theme is brought home again and again in essays from the French, English, Chinese, and Russians that appear in international defense trade journals. The reason is related to our technology, and the satuaration of technology in our nation. See Martin C. Libicki, "What is Information Warfare?" in *Toward a Revolution in Military Affairs, Defense and Security at the Dawn of the Twenty-First Century*, Thierry Gongora and Harald von Riekhoff, ed. (Westport, Conn.: Greenwood Press, 2000), 51. Libicki quotes a statistic that some 60% of current U.S. candidates for the Ph.D. in computer science are not U.S. nationals. He therefore suggests that much of the threat from hackers is increasingly external. Nothing could be farther from the truth. The strange fact of the digital generation is that unlike MOST professions, academic training is often viewed as a value detractor. Few top programmers (or hackers) have so much as a masters degree in computer science, let alone a Ph.D. The cultural trend is towards "tinkering" and self-education rather than any formal education and institutional accreditation. In the words of one hacker friend of the author, "The guys with Ph.D.s are the slugs that didn't get the six figure offers when we were undergrads so they HAD to stay in school. They couldn't get a job anywhere else."

[3]Operations Other Than War (OOTW) and its subset Military Operations Other Than War (MOOTW) are obviously the first stumbling steps towards rectifying this doctrinal gap, yet there remains a long way to go in filling in all the gaps. Partially due to intellectual limitations imposed by the Constitution and the Congress upon the United States Military (and especially the U.S. Army) we as an institution are loath to address some areas of conflict. Because the military is so completely subordinated to civil control in the United States, there appears to be an almost pathologic reluctance to consider political factors as they apply to war. (For a brief overview of the history of this relationship see, Robert L. Bateman, "Without Malice, Without Sympathy: Civilian Antipathy for the Military, 1607-2000," *Army* 49, No.1 (January 1999): 36-47.) This does not negate the fact that war is, at the ultimate level, a political act. A prime example of this phenomena is the uniquely American military reluctance to consider something as fundamental as economic warfare using civil assets in the prosecution of national goals short of or as a part of a larger war effort. (Think of the potential for destruction embodied by the assets of, for example, Soloman-Smith Barney or Merril Lynch, let alone manipulation of the lending rate by Alan Greenspan.)

[4]As with all definitions, this still leaves some gaps at the edges. Ethnic cleansing, or more accurately genocide as an objective in war, does not attempt to compel, it seeks destruction. It is alien to the American concept of war. We recognize the violence, but do not associate with the intent.

[5]DEFCON is one of the more popular hacker conventions. This year (2001) it will be held in Las Vegas. See http://www.defcon.org/. The list of popular hacker/Phreak websites linked at the defcon webpage is a useful starting point to understanding the phenomenon. "D/L" and "L.O.D." are rather typical of the types of screen names assumed by modern, if juvenile hackers. To some degree they are just being prudent, in that there are a fair number of "official" institutions more than a little interested in their collective activities. The curious fact is that even when people of this subculture meet in person, they often continue to refer to themselves and each other by their on-line "screen names."

[6]"IRL" is online shorthand for "In Real Life."

[7]This is not to say that Napoleon was not a military genius; clearly he was. Arguably no one without his unique combination of intelligence, insecurity, megalomania and daring could have "scrambled to victory" in such a consistent manner. For a well reasoned revisionist look into the leadership of Napoleon, see Owen Connelly, *Blundering to Glory*, Napoleon's Military Campaigns, (Wilmington, Del.: Scholarly Resources, 1987).

[8]The doctrinal innovation belongs to another, but Napoleon certainly gets the credit for being the first to apply the doctrine to a concrete situation.

[9]The author wishes to thank Major James Haynesworth for his assistance in identifying these leaders.

[10]Much the same argument has been raised in a more modern context by Don Vandergriff in his argumentative essay, "The Culture Wars," in *Digital War, A View from the Front Lines*, Robert L. Bateman, ed. (Novato, Calif.: Presidio Press, 1999), 231-240. Vandergriff argues that the United States Army, and especially the officer corps, has moved away from any true form of meritocracy over the course of the past century in favor of a centrally directed bureaucratically inspired process of "norming."

[11]For explanation of pre-Napoleonic logistics during the era of the *Ancien Regime* see John A. Lynn, "Food, Funds, and Fortresses: Resource Mobilization and Positional Warfare in the Campaigns of Louis XIV," in *Feeding Mars, Logistics in Western Warfare from the Middle Ages to the Present*, John A. Lynn, ed. (Boulder, Colo.: Westview Press, 1993), 137-159. A succinct explanation of Napoleon's methods of logistics is Gunther E. Rothenberg, *The Art of Warfare in the Age of Napoleon*, (Bloomington, Ind.: Indiana University Press, 1978), 129-130.

[12]David G. Chandler, *The Campaigns of Napoleon*, (New York: Macmillan Publishing, 1966), 829, 855-856. This method backfired horribly during the retreat from Moscow in the 1812 campaign. Accounts, or more specifically interpretations of the accounts differ, but nobody disagrees with the assertion that Napoleon's logistic method broke down in this case. It was not so much that there were no supplies, it was that there was no adequate method of distribution.

[13]Ibid., 139. Although it is important to note that there was an element of individual genius in Napoleon's actions, it should also be pointed out that most of his doctrinal "innovations" had actually been created decades earlier. Pierre de Bourcet's *Principe de La Guerre des Montagnes*, written at least 25 years before Napoleon's rise to power (and one of his favorite books) contained the idea of operational maneuver by advancing upon multiple parallel routes while Guibert's book *Essai Général de Tactique* (1772) contains the ideas that Napoleon put into use at the tactical level.

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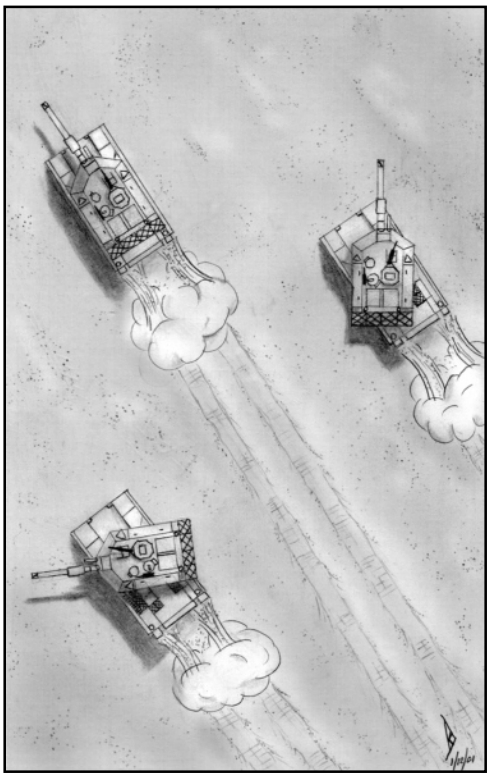
The Three Tank Platoon, A Consideration For Army XXI

by Major Kevin D. Stringer and Major D. André Hall



Art by SGT Benjamin S. Ormand

With the advent of the new Army XXI heavy division and General Shinseki's lighter brigade initiative, the U.S. Army takes a major step toward the creation of smaller, but more lethal and flexible formations for achieving victory on the battlefields of the 21st century. This new design is intended to yield a force that is better suited to responding to a wider spectrum of conflict than today's existing formations.

This trend in force restructuring creates other opportunities for re-engineering divisional sub-formations while enhancing overall combat effectiveness. One such opportunity would be a shift from a four-vehicle armored platoon to one founded on three armored vehicles. This transformation offers a force package design which, although revolutionary in nature, hones the application of the armored force on the battlefield, strengthens combat leadership roles, and realizes training and cost efficiencies. This radical change in force structure and employment doctrine would have a dramatic effect, both on the Active Component (AC) and the Reserve Component (RC) armored forces.

The current family of M1 main battle tanks provides a combat platform unmatched in the history of the U.S. armored corps and is a catalyst for this force structure change. This combat system, combined within a three-tank platoon structure, offers the U.S. Army the chance to refine the armor platoon into an organization that operates and trains aggressively with a high degree of firepower and mobility, while at the same time reducing operational and logistical costs. Ultimately, the three-tank platoon offers the Army the opportunity to concentrate on the development of junior armor leaders and optimizes limited training time. These advantages enable the Army to build cohesive units ready to face the battlefield challenges of today and tomorrow.

The most critical component of any combat organization and its underpinning technology is its method of employment. By definition and doctrinally, "the tank platoon is organized to fight as one maneuver element, not as two separate sections. The tank platoon moves, attacks, defends and performs other essential tasks to support the company team's mission." Command and control of the three-vehicle M1A2 tank platoon flattens the leadership challenge for the platoon's leaders and focuses leadership at the critical point within a unitary organization. Platoon gunnery, tactical training, logistics functions, and manning requirements are examples of issues that can be simplified by the adoption of the three-vehicle tank platoon.

Recent experiments conducted by the PLT/CO/TM Branch, Doctrine Division, Directorate of Training and Doctrine Development (DTDD), at the U.S. Army Armor Center have shown that the M1A2 is capable of operating on wider frontages at a faster pace than previous main battle vehicles. This wider battlespace offers the armor leader new challenges in command and control that could be overcome by reorganization into three-vehicle platoons. With three tanks, the armor platoon leader could better control the movement and fire of his unit while maintaining full observation in his platoon battlespace. The DTDD experiments showed that although "digitized units will communicate digitally before the direct fire fight, once close combat with the enemy begins, voice communications rule." We can infer from this statement that, despite the advent of faster paced situations catalyzed by the M1A2's capabilities and digitization, reliance on tried and true *visual and formation* techniques of command and control will be employed in future operations.

The three-tank platoon enhances the combination of digitization and currently applied techniques of command and control by demanding less of the platoon leadership while still supporting the advancement in systems through simplification of the battlespace. Simply stated, during the heat of a direct fire engagement, in rough terrain, or under conditions of reduced visibility, the platoon leader is better able to see and direct the efforts of his unit. Conversely, his subordinate vehicles can better orient on his direction of travel or main effort.

Gunnery and tactical employment are enhanced by the systems that the M1A2 fields. With the M1A2, direct fire engagements may be acquired and served faster and more effectively then ever before. Based on these refinements, the withdrawal of the fourth vehicle from the tank platoon speeds individual, crew, and platoon level gunnery and tactical training without reducing firepower. This advantage is especially useful for RC formations that have limited amounts of collective training time throughout the year. This lack of sufficient collective training time is a major weakness of Reserve Component armor combat units and has the resultant negative impact on leader development. Changing to three-vehicle platoons would alleviate this shortfall in collective combat training opportunities by simplifying gunnery and optimizing use of training time. The three-vehicle concept places the platoon leader at the spearhead of his platoon for gunnery and collective training, leading from the position of greatest maneuver and fire opportunity. He becomes the main focus of the platoon's efforts.

Logistically, support of the three-vehicle unit provides the platoon-through-division-level structure with a

simplification of the entire armor-related support package. Platoon leaders, relieved of a fourth vehicle, can focus their maintenance efforts on three vehicles. The removal of this fourth vehicle would have a ripple effect, creating a cost, time, and effort savings throughout the logistical configuration of the division. Further, a three-tank platoon would allow for easier deployment of armor assets overseas by improving space availability on air or sea transports.

Manning of the three-vehicle tank platoon would not change dramatically from current manning schemes. The three-tank platoon would retain the lieutenant platoon leader, sergeant first class platoon sergeant, and a staff sergeant as a section leader. At first glance, this leadership structure appears to be heavy. Given current demands for faster paced (challenging) and varied combat and non-standard operations using digital systems against potentially extremely capable opposing forces, the leader-to-led ratio must increase, starting in the tank platoon. The typical roles of each leader position would not change significantly within the three-vehicle tank platoon.

The three-vehicle tank platoon creates a number of issues that must be addressed when considering this idea for implementation. The withdrawal of a tank and tank crew affects the availability of soldiers in an already limited organization. The reality of current manning levels, however, often shows that this crew is already missing from many platoons and companies. In fact, given the difficulties in recruiting and retention that currently plague the Army — and will continue to do so in the future because of austere defense funding and a strong civilian economy — the three-tank platoon actually increases the chance that armor platoons will be fully manned, despite reduced personnel intake, because fewer spaces will need to be filled.

Another issue is that the leadership dynamic learned by leading within a four-vehicle platoon would be absent. The importance of this point is debatable in terms of platoon leader development. Does one less vehicle create a less capable platoon leader? Probably not. The counter-argument is that a three-tank unit allows the platoon leader to better focus his time and resources, in garrison and in the field, to maximize his training and maintenance efforts. If the platoon has four tanks but no crew to man the fourth vehicle and/or if the fourth vehicle is deadlined due to cost-driven supply constraints, this point is moot anyway.

Lastly, the concept of massed armor operations like those planned in Europe and those carried out in Southwest Asia would no longer be possible due to the overall reduction in tank numbers resulting from the introduction of the three-tank platoon. Current and future threats, however, do not appear to offer the kind of Cold War challenge that required fielding massed armored formations on the battlefield.

In terms of actual experience with this concept, the structural shift from a four-tank platoon to a three-tank platoon has been successfully implemented by the Swiss Army. Their Army 95 reform reconfigured the size of the Swiss military based upon the post-Cold War security environment. The introduction of the German Leopard II tank provided the Swiss a combat platform similar to the M1A2 to give impetus to this change. Simultaneously, the creation of consolidated armored formations at the brigade level allowed for a concentration of firepower to overcome the loss of one cannon at the platoon level.

One of the key outcomes of Swiss Army 95 reform was a major reduction in training time for combat units. The Swiss Army is essentially a militia army based upon universal conscription with a very small cadre of professional instructors. Prior to Army 95 reform, most soldiers had three to four weeks of training at the unit level per year. With Army 95, this cycle changed to two weeks every second year for most combat arms formations. Simultaneously, both officer and noncommissioned officer basic training was reduced. With this reduction in training time, a three-tank platoon facilitates movement expertise, gunnery proficiency, and command and control for soldiers and leaders who receive a bare minimum of training and practice to maintain combat expertise. The reduction in firepower is compensated for in the new brigades, where all tanks are consolidated in one mobile unit under a division headquarters. Further, in terms of cost, the Swiss generate savings by having 10 tanks per company instead of 13. This reduction lowers direct purchase costs by requiring fewer vehicles and reduces logistics expenditures because of simplified maintenance.

The introduction of the three tank platoon for the Army XXI heavy division would be a revolutionary step in force structure reform. Defense industry lobbying and armor branch political considerations aside, a three-tank platoon structure simplifies command and control, creates cost savings logistically, optimizes reduced training time by simplifying gunnery and collective training, and places the platoon leader at the spearhead of his unit. In terms of manning, a three-vehicle platoon more closely correlates with the Army's current era of reduced manpower. Although the benefits of the three-tank platoon apply to the Total Force, RC armor units would benefit the most from the three-tank concept since it optimizes limited training time. This opportunity for force structure reform should be discussed and evaluated, but not overlooked, as we move towards Army XXI.

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Redefining the Role Of the Command Sergeant Major In a Tactical Environment

by Command Sergeant Major James L. DePriest and Colonel Oscar R. Anderson

As change and OPTEMPO have both increased, all the resources available within a warfighting organization need to be examined and redefined to be made more effective than ever before and used to their fullest capacity and potential. Today's Army must realize that we are not utilizing the command sergeant major to his fullest capacity, have failed to give him a specific area of concentration in a tactical environment, and have failed to fully train him for tactical operations.

In units that have undergone reorganization and digitization, there has been a fundamental shift in the duties and responsibilities of the brigade and battalion executive officer (XO) and command sergeant major (CSM). In the past, the XO was responsible for ensuring the staff planning process was synchronized, and that the tactical operations center was postured to support the operation, to generate the requisite combat power needed to enable success, and to supervise all the logistics efforts that supported the unit.

With the digital explosion came an increase in the availability and type of tactical command and control systems, and this change continues to evolve. Because brigades and battalions do not have both a deputy commander and an XO, the XO finds himself not only the staff synchronizer but also the integrator and the director of these systems in order to provide the commander the information he needs before and during tactical operations.

The CSM is another resource the commander can use to help in effectively preparing and executing tactical operations as the logistics enabler. These duties and responsibilities must be defined between the commander and CSM, but in most cases this may be uncharted territory for both.

When a battalion commander assumes command, he will establish his "first" commander/CSM relationship. That relationship must be one that solidifies unit effectiveness and must be built on frankness, integrity, and absolute trust between both parties. A fair amount of good humor does not hurt either.

One of the first matters that a new commander must establish is the role and duties of the CSM in both the garrison and tactical environment. Too often, the new battalion commander is reluctant to direct these duties or is ignorant of what the duties should encompass, because the he may not have a depth of experience in MTOE units or may have served in organizations in which the CSM did not fully participate in all aspects of the unit or contribute to its effectiveness. In some cases, this may have been caused by the CSM's own reluctance to get involved in what he perceives as officer business, or because the battalion commander chose not to define CSM responsibilities in depth. It may also be, in part, due to the commander's past association with a CSM during his formative years as a platoon leader and company commander. Commanders may have viewed the CSM as being in charge of a second chain of command, one in which the CSM had the ability to dominate the time of his NCOs and to hold a position of greater influence than that of commissioned officers. As a result, he may have come to see the CSM as a professional rival.

But, organizational effectiveness of a tactical unit is not about officer business or NCO business, it is about leader business and the ability of the senior officer and NCO of an organization to define roles and solutions that enable winning in combat.

If the duties of the CSM are discussed between the incoming commander and his new CSM, they tend to generally follow these descriptions, found in *AR 611-201*:

- Provide advice and make recommendations to the commander and staff on all matters pertaining to enlisted personnel and their families.
- Accompany the commander on inspections, visits, and at ceremonies.
- Assist in inspections of the command as prescribed by the commander.
- Hold first sergeants or sergeants major call to pass on information and instructions.
- Ensure that newly assigned enlisted personnel are instructed in military courtesy, customs of the service, and command regulations or policies.
- Provide counsel and guidance to NCOs and other enlisted personnel of the command.
- Inspect duties performed by subordinate NCOs.
- Note discrepancies and initiate appropriate corrective instruction.
- Assist in reception of visitors to the command.
- Sit as president of the promotion board for NCOs as authorized by regulation.
- Perform other duties as prescribed by the commander.

All of the above are important duties and worthy of the experience and maturity of the senior ranking NCO of the organization. However, they are too general in scope and do not describe the CSM's tactical requirements. The CSM, because of his experience, training, and authority, is the one NCO who is best equipped to place himself to support the intent of the commander and the organization during combat.

There is, however, little out there in the form of doctrine to help the new commander develop his thinking about what the CSM's duties should be in the tactical environment. Everything said about a CSM in emerging doctrine for the armored and mechanized brigade and battalion task force can be found in two sentences.

"The **CSM** can also assist the commander by supervising and observing at

a critical site away from the command group." *FKSM 71-3 (2005) Coordinating Draft,* page 3-10 and *FKSM 71-2 (2005) Coordinating Draft,* page 3-10.

"Orders Group BRAVO (for detailed planning): Orders Group A, S1, S4, ALO, engineer, air defense officer, scout platoon leader, mortar platoon leader, GSR section leader, BMO, **CSM**, CESO, S3 Air, Chemical Officer, Chief of Reconnaissance (HHC Commander)." *FKSM 71-2 (2005) Coordinating Draft,* page 4-37.

Today's CSM must be provided a specific job description with clearly definable leader tasks. One of the most important roles that the CSM can fill to support the commander and enable the unit to win in combat is that of the logistics monitor and enabler. If we are to set conditions to enable a command team to be effective, we as an Army must be willing to specify in doctrine what a CSM does and then institutionalize these changes. We must develop a valid, applicable program of instruction in our NCOES, to include the United States Army Sergeants Major Academy (USASMA) and the Command Sergeants Major Course (CSMC), that trains the most senior NCOs on their newly defined and more focused duties as a logistics enabler. Future CSMs must be developed in both the training base and in unit assignments to fully support the tactical fight.

Our emerging doctrinal publications for brigade and task force do state "*the CSM can also assist the commander by supervising and observing at a critical site away from the command group."* This forces us to answer two questions: What are the critical sites and leader tasks the senior NCO of the brigade and battalion needs to be able to inspect and supervise?

Critical Sites

Most would generally agree that some of the more critical sites on the battlefield where the CSM can provide support to the unit and influence the action are as follows:

- Company/team assembly areas (AA)
- Task force support areas (TFSA)
- Battalion aid stations (BAS)
- Ambulance exchange points (AXP)
- Logistics release points (LRP)
- Defensive battle positions (BP)

Leader Tasks

If a CSM is to be effective at those critical sites, then he must be proficient, not just familiar, at influencing and supervising operations and activities that take place there. As stated in doctrine, *"Leader … tasks must be identified at the appropriate level to support the accomplishment of the unit mission essential tasks"* (*FM 25-101,* p. 2-9). The essential tasks that a CSM must be proficient in are:

- Pre-combat inspections
- Assembly area activities
- Maintenance and recovery operations
- Medical treatment and casualty evacuation
- Leading a logistical release point meeting
- Sending and receiving administrative and logistical reports
- Individual, crew, team, and squad fighting position construction
- Mobility and counter-mobility operations
- Advising the commander on the health, welfare, and morale of soldiers
- Battlefield restoration
- Risk management
- Reception, staging, onward movement, and integration (RSOI) activities
- Advising the orders group on combat service support, concept, planning, and execution
- Actions involving civilians on the battlefield
- Attending and providing recommendations at orders group planning sessions, orders briefs, and rehearsals.

Likewise, the battalion commander must understand the capabilities of the CSM. As a team, they must train to the strengths this division of labor brings. They must also require subordinate officers and NCOs to train the leader tasks associated with effective operations at these critical sites. This concept must be expanded to a complete training objective (task, condition, and standard) with a training information outline and evaluation guide. In addition, these leader tasks must be compiled into an expandable leader book that serves as a quick reference for the CSM. The Army's training base should also make available "re-writable" compact discs (CD-RW) to enable units that are continuing to evolve the ability to make modifications. This evolution is a process that results from the developmental nature that exists in units today and the necessary updating of tactical standing operating procedures (TACSOP) that follows the format in common use today. These standardized training and evaluation outlines provide the medium for constructing objective feedback for both the brigade and task force CSM to evaluate the status of training, strengths and weaknesses, and the information required to support the unit's Noncommissioned Officer Development Program (NCODP). By regulation (*AR 350-17,* para 5c.), NCODP is conducted at the battalion, separate company, or equivalent level. This regulation would require modification with the development of CSM leader tasks.

Acknowledging this role of the unit CSM would be a fundamental change in doctrine, techniques, and the procedures that must be embraced across the Army. This includes the unit commander, who must understand the CSM's leader responsibilities and use the CSM as the logistics monitor at critical sites. The commander must also internalize that the CSM is not his competitor or less of a professional than he requires subordinate officers to be. He must understand and require that the NCOs in his organization are responsible for building, sustaining, and regenerating combat power. The CSM, as the commander's designated representative, must work in conjunction with the task force executive officer, S1, S4, and the forward support company commander to ensure the organization accomplishes the critical tasks.

The role and performance of the CSM at the National Training Center (NTC) is of much less importance and concern than that of his commander counterpart. Every team leader (07) is a former battalion commander. With the exception of the Operations Group CSM, there is no one who has ever been a battalion CSM filling the team sergeant major (40) position. How can someone who has never performed the task coach, teach, or mentor someone who is performing the task? We must begin the process of placing experienced CSMs as observer controllers at the NTC.

Continued on Page 44

Developmental Testing of Combat Vehicles

by John McFassel

What promise do the Army and the American people have that the equipment issued to U.S. forces will perform as expected?

Answering this question is the mission of the U.S. Army Test and Evaluation Command (ATEC), which is charged with assessing the effectiveness, suitability, and survivability of the Army's equipment. ATEC has three subordinate commands, the Developmental Test Command (DTC), the Operational Test Command (OTC), and the Army Evaluation Center (AEC). This article provides an overview of DTC combat vehicle testing facilities and capabilities and discusses technological initiatives that DTC is pursuing to ensure that the equipment being acquired for the Army transformation objective force will provide the capabilities the Army needs to ensure success in future operations.

DTC operates five Major Range and Test Facility Bases (MRTFBs), two specialized technical test centers, and four smaller test activities. MRTFBs are locations with such significant capability that the DOD considers their operation critical to maintaining and developing the U.S. warfighting ability. The DTC test centers are located throughout the continental U.S., Alaska, and Hawaii, and account for approximately one third of all real estate under the control of the U.S. Army. DTC conducts approximately 1,700 tests per year and has an annual test budget of about $500 million. The command tests the entire gamut of Army equipment, from boots and uniforms through large missile systems. Testing is also conducted for the other services, other government agencies, and foreign governments. DTC's mission and capabilities are largely unknown to much of the Army, however, probably due to the fact that their workforce is almost exclusively DA civilians and contractors and most of the testing is conducted in areas with restricted access.

DTC is, without doubt, the "vehicle testing capital of the world" and has a full range of automotive test courses featuring a wide variety of natural and man-made environments, state-of-the art firing ranges, and a full complement of maintenance facilities with complete rebuild capability. DTC tests vehicles in every conceivable field environment, including the heat, humidity, and monsoon rains of the tropics; desert sand and dust; and the frigid subzero cold of the arctic; as well as nuclear, chemical, electromagnetic, and radiation environments.

One of the primary DTC test centers for ground combat and tactical vehicles is Aberdeen Test Center (ATC) located on Aberdeen Proving Ground, Maryland. Due the complexity of vehicle design, and the wide range of environments in which these vehicles must be able to operate, other test centers, including Dugway Proving Ground, Yuma Proving Ground, Electronic Proving Ground, White Sands Missile Range, and Redstone Technical Test Center, will also be involved in a complete major system assessment. Each of these test centers has developed an expertise in different, but complementary, areas. Together, they constitute an unparalleled capability to quantify exactly what a system can and cannot do and highlight areas for improvement.

An M1A1 tank undergoes automotive testing on a vertical slope grade at the Aberdeen Test Center.

The Purposes of Testing

According to *AR 73-1*, "DT is a generic term encompassing engineering-type tests used to verify that design risks are minimized, certify system safety, substantiate achievement of contractor technical performance, and certify readiness for operational test and evaluation (OT&E). DT generally requires instrumentation and measurements and is accomplished by engineers and technicians. It is repeatable, may be environmentally controlled, and covers the complete spectrum of the system's capabilities." During this process, the system will undergo many revisions as it evolves from a delicate prototype, which may only be able to be properly operated by employees of the company which produced it, to a rugged, capable item which can be mass produced and operated and maintained by a typical soldier after a reasonable training period.

The soldiers of the U.S. Army expect, and the taxpayers demand, that a combat vehicle operate properly before the Army purchases it. Developmental testing demonstrates a vehicle's basic ability to shoot, move, and communicate. It also investigates the vulnerability of the vehicle and its crew to enemy action and ensures the vehicle is safe to operate. This testing involves more than simply checking whether the vehicle meets a set of requirements. Developmental testers work closely with Army

At left, a Bradley Fighting Vehicle negotiates the cross country course at the Aberdeen Test Center, Md.

Above, an M1 tank in a firing test at the Yuma Proving Ground.

program managers and private industry system developers to identify system shortfalls and deficiencies. They then provide the field engineering expertise to assist with identifying and proving fixes. DTC works to ensure that vehicle performance and reliability are mature enough that operational testing can be successfully completed. Operational testing can then focus more on the ability of soldiers in a typical unit to operate the vehicle and how that vehicle impacts the operation of the unit, including its maintenance and supply systems.

Automotive Testing

Automotive testing of both wheeled and tracked vehicles ensures that these vehicles will reliably carry troops and equipment where required without posing a danger to the crew. Vehicle test courses include level and hilly cross-country routes; paved, secondary (gravel), and sand courses; various obstacles; slopes up to 60 percent; and mobility courses through mud, water, sand, snow and ice. Precisely laid out courses, such as the Munson Test Area, located at the U.S. Army Aberdeen Test Center, are used to reveal a vehicle's operating envelope and its ability to negotiate obstacles such as vertical slopes, side slopes, and vertical steps. More rugged courses, including on-road and off-road conditions, are used to determine how well a vehicle will operate in a field environment. ATC contains 30 all-weather permanent courses designed for evaluation of wheeled, tracked, and towed system performance and endurance. These courses may be modified for the needs of a particular program, such as by adding rubble or other obstacles to challenge a vehicle's ability to operate in an urban environment.

Because the U.S. Army must be able to operate throughout the world, vehicles must be tested in extreme climates. Yuma Proving Ground near Yuma, Arizona, and its satellite locations in Alaska and Hawaii accomplish this mission. At Yuma Proving Ground, vehicles are tested under conditions of extreme sand and dust, including the extremely rough terrain of the Middle East Desert Test Course.

An LAV under test at the Cold Regions Test Center.

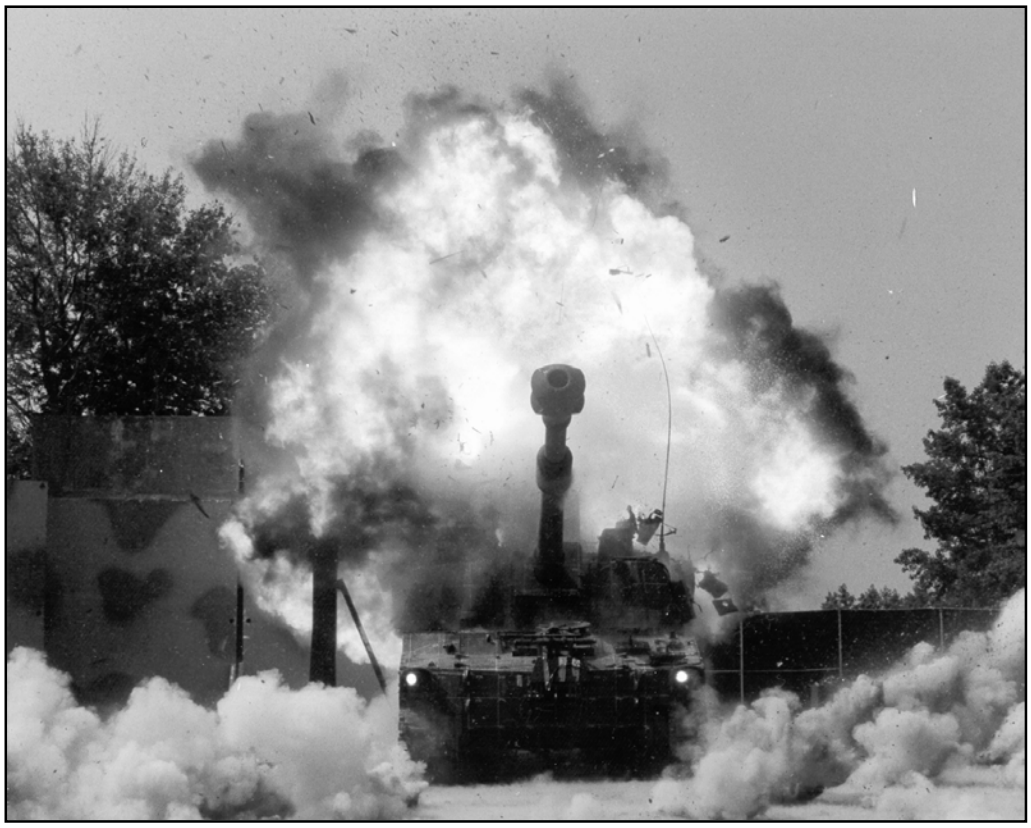
At the Cold Regions Test Center in Alaska, vehicle performance is challenged by temperatures as low as -51 degrees Celsius. At the Tropic Test Site in Hawaii, equipment is exposed to a humid tropical environment. Shallow, deep, still, and moving water fording and swimming tests are also available at DTC for conventional fording and amphibious vehicle testing.

Reliability, Availability and Maintainability (RAM) testing ensures that a system will complete its intended mission without presenting an excessive burden to the unit maintenance and supply systems. Operation on the test courses will reveal what parts are likely to fail and then an assessment will be made on the time required to correct the fault and the adequacy of technical manuals.

This information is also used to determine recommended spare parts stockage levels for both organizational and direct support/general support maintenance units. MRTFBs have the ability to conduct all maintenance operations from operator checks up through depot level procedures.

Weapons Testing

DTC's test ranges allow controlled firing of tracked and wheeled vehicle-mounted weapon systems over specifically engineered courses. Tank gunnery ranges, located at the Aberdeen Test Center, are equipped with a moving target capable of speeds up to 35 mph. Features include bump and zig-zag or serpentine courses for testing main gun stabilization and fire control systems. Firing can be conducted from either a moving or stationary position out to ranges of 2,500 meters at a computer-controlled, laser-generated target. The fully instrumented Cibola Direct Fire Range at Yuma Proving Ground provides a rail target system capable of speeds up to 50 mph for engagement ranges out to



Congressionally mandated live-fire testing of full-up combat vehicles is the responsibility of the Developmental Test Command. Here, a Paladin howitzer is hit by main gun ammunition typical of that employed by likely Threat forces.

4,000 meters using either stationary position or firing-on-the-move test courses. Additionally, stationary targets can be engaged along direct line of sight trajectories out to 10,000 meters.

DTC test centers also characterize ammunition fired from vehicle mounted weapons in order to determine such information as their range and dispersion from an aim point. This information is used to develop measures, such as ammunition lot correction factors, which maximize the possibility of first-round hits. For some munitions, such as those containing depleted uranium, environmental restrictions preclude their being fired anywhere but at a test center.

To ensure they are safe to use, all munitions are subjected to environmental conditioning, which simulates some of the conditions they might be exposed to during transportation, storage and use. Examples include hot and cold conditioning, humidity, vibration, lightning strike and drop testing. Insensitive munitions testing focuses on determining the threat that stowed missiles or rounds pose to a vehicle crew if their vehicle is hit in combat. Examples of this type of testing include bullet impact, fragment impact, and cook-off testing. Gun tubes are also tested for rupture strength, fatigue life and recoil system performance to ensure they are safe and effective.

Antitank missiles, such as TOW, provide a means for adding significant lethality to a lighter weight vehicle. Ensuring that missiles function properly and do not pose a hazard to the gunner is the job of Redstone Technical Test Center (RTTC). Testing is first conducted on missile components such as motors, warheads and seekers before the complete missile is flown. RTTC also tests the vehicle fire control system to ensure the gunner can reliably track targets and guide the missile to its target.

Communications Testing

The ability of vehicles to communicate with each other and other members of a joint and/or combined task force is obviously critical to effective command and control. Interoperability between reconnaissance, surveillance, and target acquisition systems and communications systems has become even more critical with the fielding of Force XXI digitized units.

The Electronic Proving Ground (EPG) at Fort Huachuca tests communications, command, and control; optical/electro-optical; intelligence; electronic warfare; and navigation, avionics systems and related equipment. Tests include functional performance, electromagnetic compatibility, and vulnerability analyses of tactical electronic equipment and systems in both friendly and enemy electromagnetic battlefield environments.

Live Fire

DTC is the Army's Live Fire Test Manager for Title 10, U.S. Code Live Fire vulnerability and lethality testing. Lethality ensures that U.S. weapons have the ability to defeat projected threats. Vulnerability testing addresses how well the vehicle and crew can withstand an attack from threat weapons that would likely be directed against them. Vulnerability testing begins with ballistic tests of armor samples and vehicle components. In the final phase of Live Fire testing, full-up vehicles stowed per the load plan, including fuel and ammunition, are fired upon with live ammunition representative of threats that the vehicle would be exposed to in combat. Threat munitions used in testing are often actual foreign ammunition.

These tests are conducted on fully instrumented ranges in order to extract the maximum amount of data from each event. Data includes personnel body shock, ballistic shock, blast overpressure, toxic gas monitoring, thermal measurement, as well as X-ray, high-speed video and film documentation. DTC has conducted vulnerability testing on major systems such as the

The antenna patterns of both vehicles and aircraft can be tested at the compact antenna range at the Electronic Proving Ground, Fort Huachuca, Ariz. The giant test fixture at right is capable of placing the 70-ton M1 tank at any angle to analyze its reception and transmission capabilities.

Abrams tank, Bradley Fighting Vehicle, and Paladin howitzer. Lethality testing has been conducted on ammunition such as M829 series rounds and the TOW and Hellfire missile systems.

Other Vulnerability Testing

In addition to traditional threats such as bullets, mines, missiles and artillery, combat vehicles may be subjected to NBC threats or directed energy weapons. DTC subjects test vehicles to electromagnetic and thermal pulses associated with nuclear weapons using the Electromagnetic Pulse Facility and the Electromagnetic Radiation Effects Test Facility at White Sands Missile Range in New Mexico. Vehicles can also be examined for their ability to operate in the vicinity of electromagnetic devices and for susceptibility to nuclear radiation and high power microwaves.

Testing with hazardous chemical and biological agents can be safely conducted inside the Defensive Test Chamber at Dugway Proving Ground in Utah. This is the DOD's only major test facility for chemical defense and decontamination testing. Vehicles and their components are tested for their ability to keep agents out and for ease of decontamination. The materials used when assembling the vehicle are also checked to ensure they will not deteriorate in an NBC environment.

Test Technology Efforts

DTC must continually modernize its facilities and upgrade its capabilities to retain its ability to test the continually more complex and capable weapon systems being developed. DTC coordinates with the research and development community to predict what test capabilities will be needed several years into the future. Facility upgrades take time, and DTC cannot wait until a new system prototype arrives at a test center to determine whether it can measure the desired performance parameters.

In order to derive the maximum benefit from limited testing resources, the Developmental Test Command has developed the Virtual Proving Ground (VPG) to augment live testing with modeling and simulation (M&S). The benefits of M&S have been long recognized by the Army training community and are now being realized by the material acquisition community. VPG helps with test planning through predictions of expected results and extends the range of operating conditions and environments that can be tested. The extensive data gathering capabilities of DTC are very useful in populating the extensive databases that simulations require and for proving that simulations replicate the real world to an acceptable degree.

In addition to allowing DTC to better conduct its historical testing mission, M&S increases the range of conditions that can be tested. For example, through simulation a vehicle equipped with a command and control system can be placed in an environment rich in friendly and threat electronic emissions without conducting a large field exercise with OPFOR. VPG can allow for evaluation of vehicle subsystems before the entire system has been designed and built. Additionally, a new component that could improve the vehicle's performance could be tested without having to retest the entire vehicle.

Another DTC technology initiative is the Versatile Information System, Integrated, On-line (VISION). The VISION involves small, embedded instrumentation that will stay with a vehicle from the day it is manufactured to the day it is retired. Instrumentation has been a problem in developmental testing, as the mere act of placing it on a vehicle may interfere with the normal operation of that vehicle. The embedded instrumentation will be able to transmit information about the vehicle to a digital library for analysis and storage. This instrumentation will continue to provide vehicle status information after the system has completed testing and been issued to an operational unit. This will provide the logistics commu-

nity real time information about the status of vehicles in their area and potentially allow them to predict when and where support will be needed with a fair degree of accuracy.

The digital library was used this past summer in support of testing for the Interim Armored Vehicle (IAV) for the Brigade Combat Team (BCT). Several vehicle developers provided representative vehicles for safety, mobility, and reliability testing. The data from this testing was then stored in a digital library where it could be accessed by members of the Source Selection Evaluation Board (SSEB). This function of the SSEB was to recommend which of the immediately available vehicles could best meet the needs of the BCT.

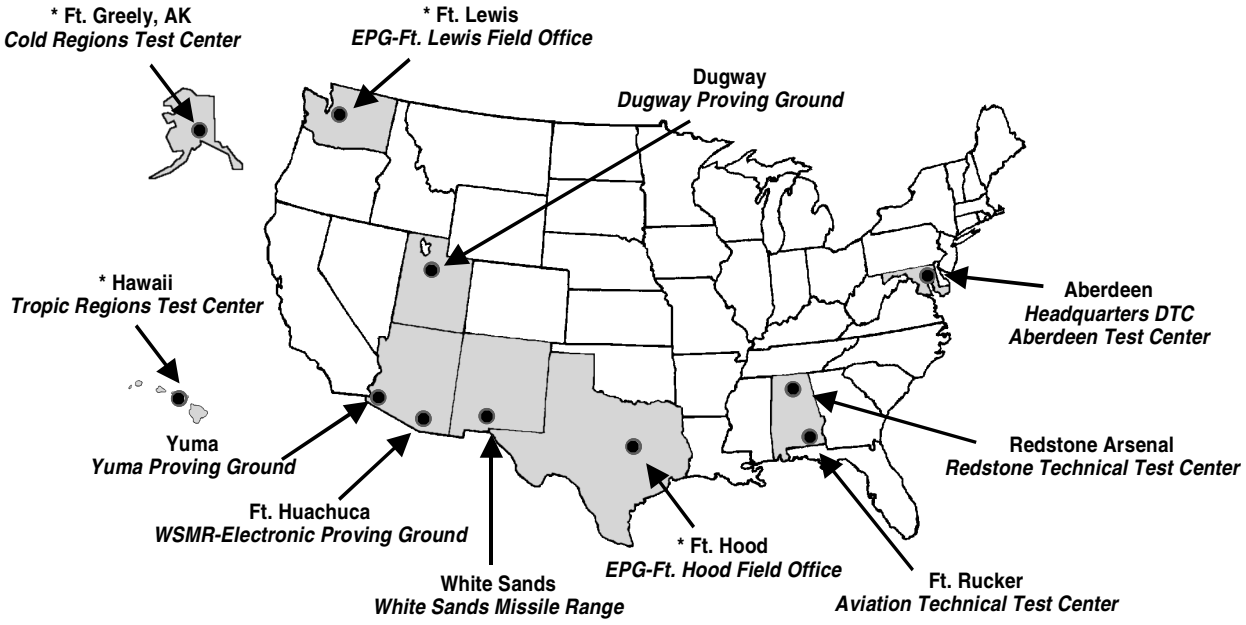
Since merging with the operational testers under ATEC on 1 October 1999, DTC has been actively exploring opportunities for combining developmental testing with operational testing in order to produce better, more efficient tests. Operational testing consists of allowing actual soldiers in the appropriate MOS to use the initial production lot of a system in an ARTEP-like environment. The thrust of this testing is to see the impact of the new equipment on the using unit. If instrumentation were embedded in the vehicles as proposed under the VISION concept, then technical data on performance and RAM could be taken simultaneously with an evaluation of the system's effectiveness and suitability in an operational environment.

Conclusion

Developmental testing is vital to ensuring the U.S. Army maintains its technological edge over potential adversaries. DTC has developed an exceptional collection of facilities, instrumentation and expertise for accomplishing the developmental test mission for ground vehicles and other equipment. Expanded use of capabilities like VPG and better integrated developmental and operational testing will result in an even greater capability to conduct testing in the future. Thorough, realistic testing ensures the U.S. warfighter will continue to have the finest equipment in the world.

Mr. John McFassel, P.E. is a 1985 graduate of the U.S. Military Academy, where he received a Bachelors Degree in Mechanical Engineering. While on active duty, he was an armored cavalry platoon leader and armored cavalry troop executive officer. After leaving active duty, he attended Texas A&M University, where he received a Master's Degree in Industrial Engineering. He has been employed with the U.S. Army Developmental Test Command for 10 years. For the first nine years, he was a test director of combat vehicle vulnerability testing. For the last year, he has been the test manager for anti-armor missiles at DTC HQ. He has completed the Armor and Ordnance Officer's Advanced Courses, CAS3 and is currently enrolled in CGSC. In the Army Reserve, he has commanded an armored cavalry troop and a basic training company.

DTC Major Ranges and Test Sites



* Satellite Locations

"Hold At All Cost"

24 hours on the Golan Front during the October War of 1973

by Major Michael D. Wickman

At 1400 hours on 6 October 1973, Syrian and Egyptian forces surged across their borders with Israel. The massive surprise attack found Israel outnumbered in vehicles, equipment, and personnel, in some instances, by 50 to 1. Israel's vaunted air force was held at bay by a wall of surface to air missiles and anti-aircraft guns, and Israeli armored columns were made vulnerable by the Syrians' excellent use of anti-tank missiles. During the first days of the battle, it appeared that Israel's defenses would be overrun, but due to the heroic efforts of Israeli soldiers, the Israeli Defense Force (IDF) was able to turn apparent defeat into a sudden rout of the armies of Syria and Egypt. Nowhere was the situation more critical than on the Golan Heights.

Some Israeli tankers fought in M51 modified Shermans.

The purpose of this article is to focus on the bravery and achievements of a few soldiers fighting on the Golan Heights and their effect on the outcome of the Yom Kippur War. Of particular note are the actions of one Israeli armor officer, Lieutenant Zvika Greengold.

The primary objective of Syrian forces was the recapture of the 480 square miles of the Golan Heights lost to the IDF during the 1967 Six Day War. Syria planned to mount a major breakthrough attempt in the north with the 7th Infantry Division, supported by elements of the 3rd Armored Division. The main thrust, however, was to be farther south in the vicinity of Rafid. This attack was to be carried out by the 5th Infantry Division, the 9th Infantry Division, the 1st Armored Division, and elements of the 3rd Armored Division, all concentrated against Israel's 188th Brigade, which could field only around 60 tanks. The Syrian plan called for the occupation of the whole of the Golan Heights by the evening of Sunday, 7 October, followed by a reorganization in the area along the River Jordan on Israeli soil in preparation for a further breakthrough into Galilee. Major-General Yitzhak Hofi, head of Israel's Northern Command, had been concerned for some time over the growing concentration of Syrian armored forces. He had expressed his concerns to Minister of Defense Moshe Dayan, who authorized units of the 7th Armored Brigade, which were being held in General Headquarters Reserve in the southern part of Israel, to move up to the Golan Heights. This move increased the number of Israeli tanks on the Golan Heights from an initial number of some 60 to 170.

The Syrian forces arrayed along the Golan Heights consisted of the 7th Infantry Division, the 9th Infantry Division, and the 5th Infantry Division. Each was organized along Soviet lines, with an armored brigade totaling some 130-200 tanks per division. Behind these first echelon divisions were concentrated the 1st and 3rd Armored Divisions, each with approximately 250 tanks, along with several independent brigades. The total Syrian force facing Israel numbered approximately 1,500 Russian T-54/55 and T-62 tanks supported by 1,000 artillery pieces, including heavy mortars.

The IDF's plan for defending the Golan Heights was based on two points. First, topography afforded the Israelis well thought-out superior defensive positions. Second, Syrian devotion to the prevailing Soviet operational level doctrine limited available openings for the massive assaults prescribed by that doctrine. An anti-tank barrier was constructed to limit a Syrian armored attack over the 1967 cease fire or Purple Line. The purpose of the barrier was to delay the Syrians sufficiently until reserve forces could be committed to reinforce units on the line. Time was the primary issue for both the Israelis and the Syrians. The IDF needed time to deploy reserves before a Syrian breakthrough or, "if politically possible, to mount spoiling attack" as a preemptive measure. The Syrians needed to quickly penetrate the IDF defenses and reach the edge of the plateau overlooking the bridges of the River Jordan before the arrival of IDF reserve forces. This would force the IDF to move their reserves across choke points and up steep narrow winding roads, making a successful counterattack nearly impossible.

The Israeli forces defending the Golan Heights were composed of two Israeli armored brigades, the 7th in the northern sector and 188th (Barak) Brigade in the southern sector, consisting of approximately 170 tanks and some 60 artillery pieces. Israeli armored forces were composed of British Centurions and M51 Shermans.

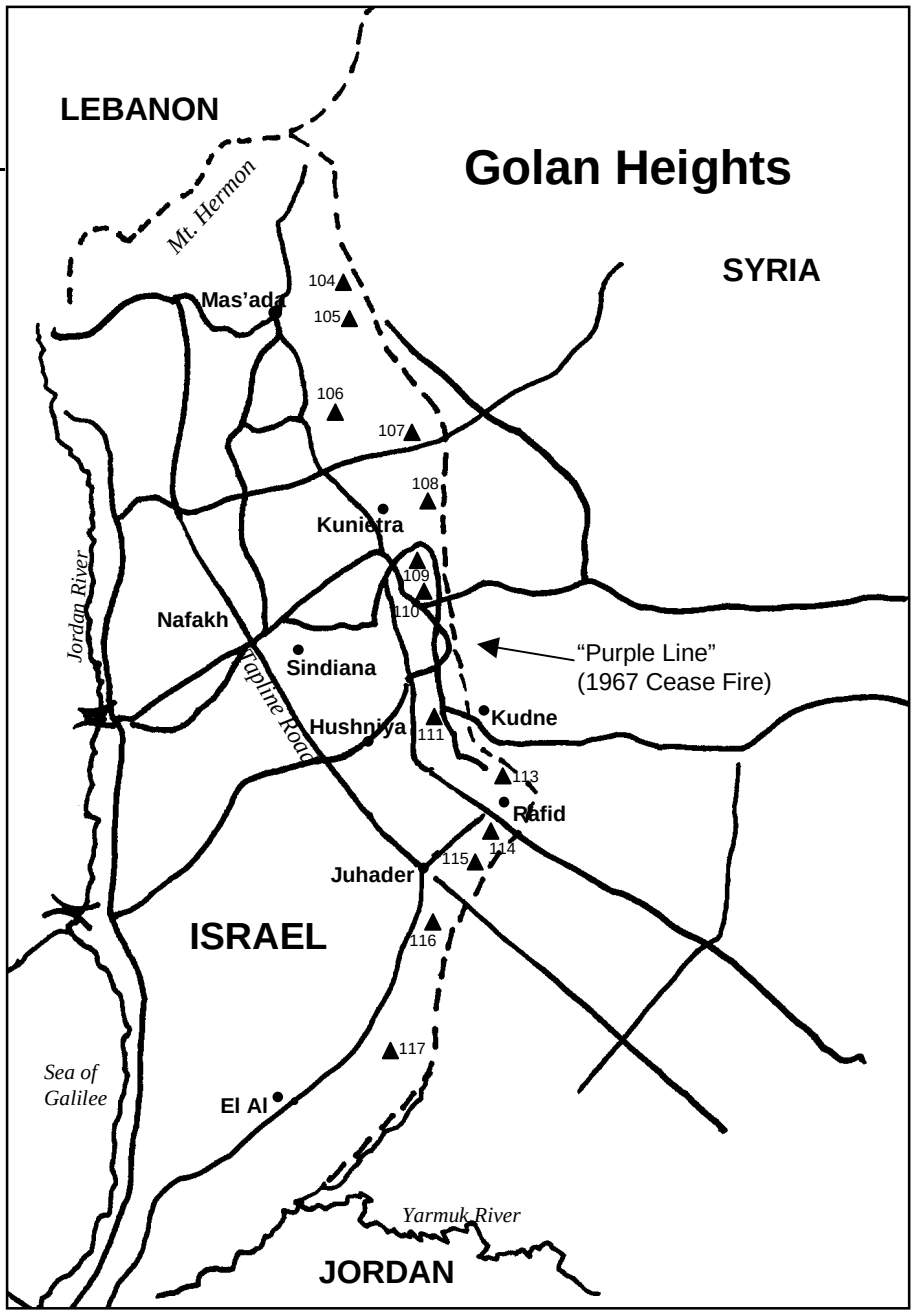
The massive Syrian air and artillery strike against Israeli positions on the Golan Heights achieved tactical surprise. The Syrian 7th, 9th, and 5th Infantry Divisions attacked across the Purple Line, while in the north, the Israeli 7th Armored Brigade repulsed the Syrian 7th Infantry Division. The Syrian 3rd Armored Division, committed to pass through Israeli's 7th Infantry Division, also suffered heavily and gained little ground. In the south, the

Syrian 5th and 9th Infantry Divisions, taking advantage of the less restrictive terrain, broke through the defenses of the Barak Brigade. In two days of fighting, the Barak Brigade was virtually destroyed, and the command post at Nafakh surrounded. The Syrian 9th Infantry Division "had split the Israeli defensive forces, and now threatened the command center at Nafakh."[1] The remnants of the Barak Brigade were barely hanging on and were in desperate need of reinforcements. The collapse of the northern sector could have forced the IDF to fall back to the Jordan River and therefore changed the outcome of the war. The original plan of reinforcing with reserve brigades was falling apart. "As Israeli reserves arrived on the shore of Lake Tiberius and the west bank of the River Jordan, they were immediately sent forward in small groups into battle."[2]

"At this time, something just short of a miracle was underway at Nafakh. Frantically trying to reach the Golan by any means possible was [Lieutenant] Tzvi 'Zvika' Greengold, who had been on a fortnight's leave."[3] Lieutenant Greengold had been safely at home, near Haifa, only seven hours earlier. He had just been released from service with the Barak Brigade and was on leave for two weeks prior to attending a company commander's course. He was one of the first soldiers to make his own way back to the battlefield.

At the Nafakh headquarters of the Barak Brigade, the commander, Colonel Ben-Shoham, was analyzing spot reports coming in from his battalion commanders on the size of the Syrian attack. While he was deciding his next moves, he was approached by Lieutenant Greengold, who arrived to find Nafakh in chaos. Greengold, having no troops nor tanks to command, assisted with the removal of the dead and wounded from disabled vehicles. He soon learned that four tanks, three of which had been battle-damaged, were about to arrive. Zvika requested and received command of the four tanks. He was delighted.

Lieutenant Greengold was ordered to take the four tanks and move towards the Tapline Route, a major Syrian avenue of approach. Lieutenant Greengold and his four tanks were to be known on the brigade communications network as Force Tzvika.[4]



By that time, Colonel Ben-Shoham was greatly concerned by the Syrian advances in the southern sector, where the 51st Tank Brigade had broken through and was bypassing the Israeli fortifications in the vicinity of the Hushniya-Tapline crossroads. Savage nighttime firefights were taking place across the southern Golan Heights, and Israeli troops were cut off in their frontline fortifications. Transmissions to their headquarters at Nafakh finally produced authorization to withdraw, but this was easier said than done, with Syrian forces to their rear. At Kudne, a relieving tank force broke through to Bunker 111, despite strong Syrian forces in the immediate vicinity, and succeeded in evacuating all the men. Along the southern flank, where the battle was then heaviest, the fight was more difficult. Israeli tanks fought through and relieved Bunker 114 and Bunker 115, but Bunker 116 was completely surrounded.

Unable to get out, the Israelis sat tight in their defenses and called for artillery support. The only available artillery was a single battery of 155mm guns, which was ordered to concentrate on Bunker 116's position. The fire mission was extremely effective and provided temporary relief to the troops inside.

Because of the penetration in his sector along the Tapline Road, Colonel Ben-Shoham attempted to move the forward headquarters (one tank and one

halftrack) of his brigade from Nafakh to Juhader, where he believed he could better control the battle. He moved carefully along in the dark, avoiding Syrian formations, and his staff was relieved to reach Juhader. By then, they were under constant heavy shelling, due to poor IDF communications discipline and successful Syrian SIGINT operations. The Syrians obtained radio fixes every time a communications officer tried to contact his subordinate commanders.

In the meantime, TF Zvika, which had left Nafakh several hours before, was moving cautiously along the Tapline Route. Zvika had been intent on joining Colonel Ben-Shoham, but instead had run into a Syrian tank company. Zvika promptly sent a contact report to Colonel Ben-Shoham and first engaged the enemy at 2100 hours on 6 October. Zvika took advantage of the terrain and limited visibility, moving his force into hull-down positions and letting the enemy come to him. Zvika's force waited only a short time until one of his tank commanders reported contact with an approaching Syrian column consisting mostly of T-55s. Zvika peered into the gloom and saw them by the dim glow of their "formation lamps and infra-red 'cats eyes'."[5]

"At about 2120 hours, Zvika spotted a solitary Syrian tank on the road about four kilometers outside Nafakh and only ten meters from his own Centurion. Zvika tapped his gunner, and the Syrian burst into flames. Fearful of being seen or set ablaze in the horrendous flash of burning fuel and munitions, Zvika ordered his driver to back up fast. He then found that he had no way of communicating with the other tank or of even speaking with his own crew. The shock of the explosion of the Syrian tank had jolted out the radio and intercom circuits. Zvika jumped down to the roadway and stalked over to the other Centurion, ejecting its commander and motioning him to climb aboard the defective tank. "Watch me," he cautioned the other man, "and do as I do, if possible."[6]

Zvika then continued to work his way south along the Tapline Road, the two tanks moving slowly forward, using the terrain to mask their movement. Zvika soon realized that he was alone, the other tank having lost its position in the dark. Moving over the crest of a hill, Zvika was confronted by three Syrian tanks moving towards them with their driving lights on. Three rapid shots from the Centurion's 105mm gun left the enemy tanks blazing brightly, and the illumination of the area from the fire greatly aided Zvika's movement. "The intruders belonged to the 51st Independent Tank Brigade, and they were feeling their way into the Israeli rear, seeking to exploit the breakthrough. Apparently they had turned on their sidelights to see better, to gain speed."[7]

Zvika shifted into a new position and within minutes destroyed three more T55s. Zvika realized that the Tapline Road was a major avenue of approach, that he was frequently outnumbered and he was facing tanks with superior night fighting capabilities.[8] Zvika chose to hold in his current position, take advantage of the defensible terrain, and wait for Syrian forces. Thirty minutes passed until they were alerted by the sound of heavy engines. A long column of T-55s appeared out of the darkness, followed by a procession of trucks. "It was as if the main body of Major Ismail's 452nd Tank Battalion was on parade, so perfectly aligned and spaced was the column.

Zvika waited until the lead tank was only twenty meters from where he was hunkered down. The first shot stopped the first target and stalled the entire column"[9] Zvika was up against terrible odds, but he had the enemy fixed and was in position to destroy the entire column. Zvika withdrew into the darkness, taking advantage of the scrub and rocky outcrops, only to appear and fire before disappearing again. He kept this uneven match going for over an hour. The Syrians' sole warning was a crash and a long jet of white flame shooting through the night to destroy another of their vehicles. The Syrians were extremely bewildered by the single shots that kept hitting their tanks from all along the roadway. Frustrated, several Syrian tankers switched on searchlights to try and locate what they thought was a sizeable enemy force. The illumination gave Zvika and his gunner more clear targets to engage. Ten armored vehicles were either destroyed or damaged before Major Ismail ordered the remnants of his battalion to withdraw. What the Syrians believed was a sizable force was actually the work of a single tank crew.[10]

Several miles further along the Tapline Road at Nafakh, Colonel Ben-Shoham realized he was surrounded. His brigade intelligence officer suggested that as it was impossible to get back to the Nafakh headquarters by the Tapline Road, they had better cut across country. Colonel Ben-Shoham directed his tank and the headquarters' half-track to head west toward the ridge of the Golan Heights near Ramat Magshimim. At approximately 0200 on October 7, they reached the Gamla Rise overlooking the Sea of Galilee, a primary objective of the Syrian forces. They were dismayed to observe new Syrian T-62 tanks not far away along the escarpment, and in full view of Galilee. At that rate, Syrian forces would soon cross into Israel proper. The Israeli tank and its accompanying half-track continued to move along in dim moonlight, keeping among the boulders on the slopes to screen themselves from the large Syrian force moving parallel to their position. Colonel Ben-Shoham tried to determine the status of his brigade, and feared that very little remained. Meanwhile back in Nafakh, a reserve battalion commander named Lieutenant Colonel Uzi More received permission from the CinC of Northern Command to leave the base and take command of the tanks along the Tapline Route. He was to fight a delaying action along the Tapline Route to slow the Syrian advance towards Nafakh Camp. This force included Zvika's small group and two reserve tank platoons of the Northern Command Reserve, which were the only reserves available in the southern sector. Lieutenant Colonel More received the order from Colonel Ben-Shoham to mount a counterattack, and proceeded southwards along the Tapline Route, while Tzvika and a platoon of tanks drove parallel along the road's wire fences.

Almost immediately, the first tank in Zvika's column was set ablaze by a rocket-propelled grenade. Zvika saw Syrian tanks equipped with searchlights blocking the road ahead, and Zvika ordered one of the remaining tanks forward to rescue the crew of the burning Centurion. He positioned his own tank to cover in the flank, and both tanks were hit. Zvika's gunner was injured, while Zvika himself reeled from the shock of the blast and searing pain. Zvika and his crew scrambled from their blazing Centurion, falling to the ground in flames and screaming as flames seared their faces and hands. Zvika's shirt and trousers were burning, but he rolled into a ditch and somehow smothered the flames. He was fearful that at any moment his tank, still carrying fuel and ammunition, would blow

"Colonel Ben-Shoham realized all that remained of his brigade were a handful of tanks fighting for their lives along the Tapline Route."

up. Not realizing the extent of his wounds, he ran towards another tank, shouted garbled instructions, and took command of the vehicle. He then activated the communications system, announcing to all that TF Zvika was still in existence.[11] Even as Colonel Ben-Shoham's relieved acknowledgment faded on the radio, Zvika realized the extent of his wounds, and the terrible burns on his face and hands began to throb and blister. Only Colonel Ben-Shoham's calm but insistent voice brought him back to reality. Moving straight for him were two Syrian tanks, bearing down with their guns firing. Zvika fired and screamed for his driver to reverse. The tank shuddered as its tracks tore around on the bare rocks, then raced backward into the inferno of the night, its crew still battling against the heavy odds.

The remainder of Colonel Ben-Shoham's counterattack force also made contact with the mechanized infantry that had been accompanying the tanks that Zvika encountered. More's tanks were hit and disabled, one at a time. When More saw a Syrian soldier aim an antitank rocket at his command tank, he grabbed hold of his free machine gun and opened fire. However, his machine gun jammed and the Syrian grenadier let fly. More was thrown from his tank and lost an arm and an eye in the blast.[12]

Colonel Ben-Shoham reported up the chain of command the failure of his counterattack and did his best to stabilize the situation. With minimal resources he calmed the nerves of his commanders, called for artillery support, and attempted to maintain situational awareness of the battle that surrounded. In order to improve command and control, Colonel Ben-Shoham requested the command of all forces in the southern Golan from the regional commander. It was apparent that the Syrians were swarming all over the southern sector of the Golan Heights.

In the north, the Israeli 7th Armored Brigade was defending positions in and around Booster Ridge against the Syrian 7th Infantry Division, elements of the 3rd Armored Division, and a brigade of Moroccan troops. Fighting from prepared positions, the Centurion-equipped 7th Armored Brigade held out against odds sometimes as high as 15 to 1. Under constant artillery and air attack, Colonel Ben Gal, the 7th Armored Brigade commander, calmly directed his dwindling forces, maintaining a reserve which he moved from ambush to blocking position to battle position during 72 hours of continuous fighting.

The 7th Armored Brigade, although down to a handful of operational tanks, never gave up their primary positions.[13]

In the southern sector, the crisis continued to develop. Sunrise on the 7th of October revealed that the Syrians had achieved a major breakthrough in the southern sector of the Golan Heights. The 132nd Mechanized Brigade and 47th Independent Tank Brigade of the 5th Infantry Division had made a major penetration along the Rafid El-Al road. The Syrians exploited this penetration with the 43rd, 51st, and 91st Armored Brigade, a force of more than 500 tanks.

Colonel Ben-Shoham identified the advancing second-echelon Syrian columns, and chose to regroup his forces and attempt to delay the Syrian penetration. His tank and half-track sped back towards Nafakh, dodging tank and RPG fire along the entire route. Colonel Ben-Shoham realized all that remained of his brigade were a handful of tanks fighting for their lives along the Tapline Route. He decided his best course of action would be to rally his meager forces and join his deputy, Colonel Yisraeli, and the 679th Reserve Armored Brigade (now reaching the front in small numbers).

"Every three tanks now reaching the front were assembled into make-shift platoons, patched into the communications network and rushed towards Ben-Shoham's position. All in all, two companies were pieced together, and the newly formed units reached Nafakh and re-established the Barak Brigade's headquarters."[14]

At approximately 1145, Major Baruch Lenschner identified a lead element from the Syrian 1st Armored Division as the 91st Armored Brigade. Major Lenschner, Deputy Commander of an independent Northern Command battalion, was commanding a hastily assembled force of initially 14 Centurions. That was now down to two operable tanks. He reported sighting the T-62s of the 91st Armored Brigade and stated that his position was untenable. Colonel Ben-Shoham urged the young major to hold at any cost. Major Lenschner and his small force were not heard from again. It was later determined that Major Lenschner perished when the warhead of a Sagger missile punched through the Centurion's turret armor and his force was overrun.[15] Outflanked, the brigade headquarters at Nafakh was now under attack. Ben-Shoham was ordered to return to Nafakh for the base's defense, and ordered his deputy Lieutenant-Colonel Yisraeli to set out and cover his force.

Unknown to Colonel Ben-Shoham, Zvika had met up with Colonel Yisraeli's force at dawn and fought in the battle that delayed the Syrian 51st Tank Brigade's attack along the Tapline Route. Just when Zvika had thought they were gaining the upper hand, Yisraeli frantically ordered his force back to Nafakh to escape the Syrians' outflanking movement.

Throughout the retreat, Colonel Ben-Shoham's tank came under heavy Syrian artillery and tank fire. Both he and Yisraeli succeeded in destroying more than twenty Syrian tanks and vehicles. As the battle raged and Syrian tanks approached to close range, Yisraeli's gunner announced that the tank was out of ammunition. Yisraeli ordered his driver to charge an oncoming T-62 with machine guns blazing. Within moments, his tank in flames, Lieutenant-Colonel Yisraeli was dead. Ben-Shoham, unaware of the fate of his deputy, continued to issue orders. Standing upright in the turret, Ben-Shoham observed the battle, firing at Syrian crewmen fleeing their burning vehicles. As he searched the hills for Syrian commandos, a sudden 7.62mm volley killed Colonel Ben-Shoham. Losing radio con-

Israeli Centurions move up on the Golan front.

tact with his commanders, Zvika left the roadway and approached Nafakh cross-country from the southeast without encountering Syrian forces, but just missing a Syrian ambush.

The 91st Armored Brigade continued its push towards Nafakh. Lieutenant-Colonel Menachem (Pinie) Cooperman, deputy commander of the District (administrative) Brigade, organized Nafakh's defenses and issued antitank weapons to soldiers manning the perimeter. Standing at the southern perimeter fence, he watched the advance of approximately two Syrian tank companies, and ordered the advanced headquarters group to withdraw from Nafakh. As this force left the base, hundreds of Syrian shells rained down on the camp. Syrian tanks were now entering Nafakh unhindered, firing point-blank at the base's evacuated buildings, raking the Israeli defenders with coaxial and turret-mounted machine guns. Lieutenant-Colonel Cooperman grabbed the division's deputy intelligence and operations officers, a bazooka and six shells, and rushed to try and stop the Syrians from taking Nafakh.

Suddenly, the 679th Reserve Armored Brigade arrived to save the day. Firing at long range, the 679th managed to hold the Syrians and push them out of Nafakh. Yet Syrian tanks were still inside the base, and Lieutenant Colonel Cooperman's determined antitank unit, now out of ammunition, was cornered by a T-62. As the T-62's 115mm gun turned towards them, the tank went up in a ball of flame. Approaching the rescued officers was a battered tank moving at a slow speed. It was Zvika! Zvika had arrived at Nafakh camp just as the Syrians were breaking in, he had joined forces with a reserve tank, and with more enthusiasm than good sense his exhausted crew attacked the Syrians. "Zvika fired wildly at everything in sight — at the hills and the fences and at the Syrian tanks that had already flattened the perimeter fence. The truth was that his tank driver was in the shock of exhaustion and could no longer react to orders after twenty hours of continuous, nerve-twisting battle."[16] During the pandemonium, Zvika attached himself to the 679th Armored Brigade and with them forced the Syrians out of the ruined camp and back onto the Tapline Road.

The Syrian advance had been stopped at Nafakh and the blackened, smoking wreckage of their tanks, personnel carriers, and trucks lay everywhere, in the camp and on the dun-colored hills. "When the battle around Zvika ceased, he found himself standing in the turret of his fifth or sixth Centurion, suddenly unable to make a decision as to what to do next. The Barak Brigade intelligence officer — now the nominal brigade commander — rushed up to greet the lieutenant. As he fought an overwhelming lethargy, Zvika painfully climbed from the turret and carefully dropped to the ground, where he leveled his eyes on the intelligence officer and apologetically murmured, 'I can't anymore.' The intelligence officer said not a word; he hugged Zvika close and led him to the medical evacuation center. There is no way to calculate the damage that that iron-willed redheaded youth inflicted upon the best plan with which Syria has ever entered a conflict."[17]

To say that the actions of Lieutenant Zvika Greengold directly affected the outcome of the Yom Kippur war would be an overstatement. But it goes without saying that his actions greatly aided the successful defense of the Golan Heights.

"For his incredible 24 hours on the Golan, Lieutenant Greengold was awarded the Ot Hagvura (Order of Bravery), the IDF's medal for supreme valor."[18]

Notes

[1]Jerry Asher with Eric Hammel, *Duel for the Golan: The 100 Hour Battle that Saved Israel* (New York: William Morrow and Company, Inc., 1987), p. 123.

[2]Edgar O'Ballance, *No Victor No Vanquished: The Arab-Israeli War 1973* (Novato: Presidio Press, 1978), p. 132.

[3]Samuel Katz, *Israeli Tank Battles: Yom Kippur to Lebanon* (London: Arms and Armour Press, 1988), p. 18.

[4]Ibid., p. 18.

[5]David Eshel, *Chariots of the Desert: The Story of the Israeli Armoured Corps* (New York: Brassey's Defence Publishers, 1989), p. 101.

[6]Asher and Hammel, p. 96.

[7]Ibid., p. 96.

[8]Anthony Cordesman and Abraham R. Wagner, *The Lessons of Modern War Volume I: The Arab-Israeli Conflicts, 1973-1989* (Boulder: Westview Press, 1990), p. 72.

[9]Asher and Hammel, p. 97.

[10] Ibid., p.97

[11]Samuel Katz, *Israeli Tank Battles: Yom Kippur to Lebanon* (London: Arms and Armour Press, 1988), p. 20.

[12]Asher and Hammel, p. 105.

[13]Peter Allen, *The Yom Kippur War: The Politics, Tactics and Individual Actions By Which Israel Repelled the Arab Invasions of 1973* (New York: Charles Scribner's Sons, 1982), p. 31.

[14]Katz, p. 21.

[15]Asher and Hammel, p. 137.

[16]Allen, p. 91.

[17]Asher and Hammel, p. 146.

[18] Katz, p. 25.

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The Field Problem Review Board:

Finding Solutions to the Problems That Soldiers Experience

Ever since there have been tanks, tankers in the field have been finding things wrong with their design and functionality. Over 14 years ago, Team Abrams was formed, drawing together the efforts of the TRADOC System Manager, Abrams (TSM, Abrams); Project Manager, Abrams, (PM, Abrams); the Tank Automotive and Armaments Command (TACOM); and General Dynamics Land Systems (GDLS). This unique program identifies and attempts to solve tank-related and Heavy Assault Bridge (HAB) concerns coming from the field.

The Field Problem Review Board (FPRB) has the mission of continuously monitoring reports from the field and from test sites to identify any problems affecting the safety, reliability, availability, maintainability, and performance of the Abrams and Wolverine HAB.

The FPRB meets in Warren, Mich. every second month. It is composed of design and safety engineers, reliability and maintainability (R&M) specialists, Quality Assurance (QA) engineers, logisticians, managers, and military representatives from Team Abrams. Field Service Representatives (FSRs) from GDLS, Logistic Assistance Officers (LAOs) at all posts, test officers from the Army's Proving Grounds, Team Abrams engineers and logisticians, and soldiers from the field all provide data on problems the Abrams fleet is experiencing.

You may wonder, after 108 FPRB meetings, what some of the Board's recent successes have been. One of the first problems identified with the Abrams platform was the air induction system on the AGT 1500 engine. The FPRB identified this problem from a number of sources, and then redesigned the pre-cleaner on the air induction system to reduce clogging and the consequent reduction of airflow into the engine. Next, they came up with the PulseJet Air System (PJAS) as a means to constantly clean the V-packs without physically taking them out of the tank. These two fixes reduced the number of airflow or debris-related engine failures to a relatively miniscule level.

Not all fixes involve hardware. Recently, the fleet experienced problems with fires. The three leading causes were engine compartment fuel leaks, hydraulic leaks, and problems with the NBC system. The FPRB set up a mobile training team to educate soldiers on the NBC system and tank fire prevention. That team has gone to every post where there are Abrams tanks, training crews, maintainers, and leaders on how to properly maintain and inspect these areas to prevent fires.

The FPRB is tracking a number of issues and monitoring the effectiveness of the corrective actions being taken to resolve them. One example concerned recent transmission failures seen at Fort Hood. Last year, the FPRB implemented a modification to the transmission valve body and has been closely monitoring the situation to see if any more transmission failures occur. So far, none have occurred related to the valve body, but this continues to be a watch item.

The FPRB is currently tracking over 25 problems with the fleet. It has a database of over 18,000 field problem reports and over 68,000 test problem reports. With only 25 problems being tracked currently, you can see that the majority of design and production deficiencies are corrected before you even see the tank. Remember, though, that if you see a problem, report it! If you believe the problem is not being worked, then document it and report it again! The primary way to report a problem directly to the FPRB is via the Field Problem Management Hotline at 1-800-989-TANK. But you must also keep your chain of command aware of what you see, because they may already know of fixes that may be on the way to solve your problem.

The front line for identifying problems back to the FPRB are the GDLS FSRs. Team Abrams provides FSRs to every newly equipped battalion in the Armor Force for the first year after new equipment fielding. The FSR's first priority is providing both technical expertise and training to organizational maintainers. They also provide a conduit for reporting systemic problems back to the FPRB.

The LAO is another source for information regarding problems. Each post has an LAO staffed with TACOM logistics specialists. As the LAO for TACOM, they have a direct link to Team Abrams and the FPRB.

Team Abrams also actively searches out performance and R&M problems through continuous testing of the tank, primarily at Aberdeen and Yuma Proving Grounds. The test team continuously monitors whether the tank performs in accordance with its performance specifications and user requirements. Also, the conditions leading to field failure can be tested and data captured to solve the problem. The test community also tests the corrective actions to ensure the solution fixes the problem and does not create new problems.

Quality assurance specialists constantly monitor the production of components going into the tank and HAB. These specialists are a key link in the FPRB process. They determine if a production line change may be causing the field problems. They also ensure that the suppliers and sub-contractors are producing parts for the tank in accordance with design and quality specifications.

Logisticians also play a key role in the FPRB process. They constantly monitor supply system demands to determine if items are being requested at rates inconsistent with their expected usage. The logistic fielding branches, with their constant contact with the field, also provide first-hand evidence of systemic problems being experienced in the field.

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ENTER THE GAUNTLET

The Armor School Is Transforming How We Train Our Combat Leaders

by Second Lieutenant Humayun S. Khan

The Armor School is adopting the concept of the scrimmage, one of the most effective training techniques of a good football team, in order to improve the training of lieutenants, captains, and NCOs.

In the past, lieutenants trained with lieutenants, captains with captains, and NCOs with NCOs, but this kind of peer group training has obvious limitations. A captain learning to develop effective orders should ideally be testing his capabilities with lieutenants — like he will in the real world — rather than with other captains, yet this is the system the Armor School has used for years. This method is convenient and easy to schedule training this way, but unrealistic.

Good football teams use another method entirely. After initial conditioning, players learn the plays in blackboard "skull sessions," then crawl and walk through non-contact drills, but the real training comes in scrimmages, where each player gets to perform in his game day role.

The Armor School is working to do the same thing. By synchronizing the course schedules of captains, lieutenants, and NCOs, the Armor School has been able to develop a training event called the Gauntlet that breaks through the limitations of peer group training and allows students at each level to deal with soldiers with the same experience levels that they will encounter in their units. Captains give their orders to lieutenants, not captains role-playing lieutenants.

The earlier method of peer group training, taken from public education, may have worked well when our leaders were in elementary school, but for the complex battlefield environment, a leader needs to know each job and work well with others without hesitation. While peer group training produces knowledgeable leaders, it does not provide the real-world experience of leading soldiers of different ranks and knowledge levels. In so doing, we have limited experience-based learning and de-emphasized the relationship between peer groups.

Under the earlier system, Army leadership schools were focused on the assumption that transmitting and retaining knowledge is more important than gaining experience. Certainly, knowledge is a prerequisite for gaining experience, but experience may be more consequential on a future battlefield, especially a battle-simulated experience dealing with non-peers in a professional relationship.

A football scrimmage provides an analogy. It involves all the players in their respective roles. Quarterbacks do not scrimmage with other quarterbacks. A scrimmage is made realistic by pitting an offense against a defense, and by the pressure created by keeping score. A scrimmage allows the coaches and the quarterbacks to build skills not otherwise developed.

Currently, the school emphasizes problem solving, organization, tactical proficiency, decisiveness, communication, and judgment. While these skills are essential, they are limited with regard to the scope of the battlefield. The new skills students will focus on are: adaptability, innovation, conceptual thinking, intuition, creativity, rapid decision-making, and dealing with pressure. "Scrimmages," can instill these attributes in our soldiers faster. In the 16th Cavalry Regiment, exercises called Gauntlets simulate scrimmages.

These training events are battle-focused, multi-echelon experiences designed to train adaptive leadership skills and build self-confidence. Students in the Armor Officer Basic Course, Armor Captains Career Course, Scout Leader Course, Cavalry Leader Course, and the NCO Academy Advanced NCO Course and Basic NCO courses currently overlap, providing opportunities for joint training.

These multi-echelon training events are organized at three levels — live training, virtual training, and constructive training. Live training is most similar to a scrimmage. It is as close to an actual battle experience as one can get. Live training opportunities are FTXs, gunnery, MOUT (Military Operations in Urban Terrain) paintball, and MOUT TEWT (Tactical Exercises Without Troops). Virtual training involves simulation of the battlefield, as in the CCTT (Close Combat Tactical Trainer), SIMNET, and UCOFT (Unit Conduct of Fire Trainer). Constructive training involves the training of tactics, rather than crew-level skills. Constructive training opportunities include Janus and TACOPS.

The 16th Cavalry Regiment at Fort Knox has conducted multi-echelon training events at all three levels and the results have been good. The first training event, CCTT/SIMNET, trained 64 lieutenants from the AOB Course and 80 captains from the ACC Course on the CCTT and SIMNET facilities concurrently. The captains' course provided the task force operations order, computer scenario, and company-level leadership (students). The lieutenants' course provided platoon leaders (students), and gunners, drivers, and loaders. Small group instructors in each course evaluated students.

The exercise trained troop leading procedures (TLPs) and offensive and defensive operations. Offensive operations for the captains were support by fire, breach, assault, and movement to contact, and the lieutenants executed battle drills, actions on contact, support/attack by fire, and assault. In the defense, captains conducted reconnaissance and security operations, preparation of a battle position, defending a battle position, and defending in sector, while lieutenants conducted direct fire planning, defend a battle position, and call for indirect fire. Through these missions, lieutenants were given the opportunity to learn from captains.

"Nobody's coming in here saying they can't learn anything. Everybody's going to learn something. That's what's important and fun about it!"

Photos by Robert L. Stevenson

Captains provided leadership and mentoring to lieutenants in a working environment. The captains noted that they were able to assess how well they conveyed information and intent to lieutenants, not captains playing the role of lieutenants.

The next multi-echelon training event was a constructive TACOPS which also combined ACCC and AOB students. The intent was to allow a company (one captain and three lieutenants) to conduct a defense in sector in a constructive environment. Eleven captains and 33 lieutenants paired up in companies and conducted a leaders' reconnaissance. Later, each company fought a battle using the TACOPS constructive simulation, and winning companies were released for the remainder of the day, while losing companies transitioned to the OPFOR cell until victorious. Lieutenants found the tactical problem complex, and captains were often frustrated communicating with lieutenants. Both groups found the interaction useful.

An FTX Ten-Day War served as the live training event. Sixty-four lieutenants, 36 captains, and 16 sergeants first class trained to become confident, adaptive, and proficient leaders. The objectives were to maximize leadership opportunities, establish a method of leadership assessment, incorporate SASO (Stability and Support Operations) and OOTW (Operations Other Than War), and explore Force XXI technology. The exercise incorporated various scenarios with increasingly challenging variables and conditions, requiring innovative thinking and testing the adaptability of students. The exercise provided a realistic, fatiguing, stressful, training environment, and assessed new leadership skills of adaptability, innovation, conceptual thinking, intuition, creativity, rapid decision-making, and dealing with pressure. It stressed leadership by combining student sergeants, lieutenants, and captains, leading one captain to comment: "...One of the most valuable pieces was having the NCOs involved, which added a lot of depth and experience... and gave the lieutenants some good insight about what it's going to be like working with their platoon sergeants for the first time."

"The greatest challenge is getting the lieutenants to listen to you," said one sergeant first class who was attending ANCOC. "… to integrate our experience with their training. But everybody's taking something from this. Nobody's coming in here saying they can't learn anything. Everybody's going to learn something. That's what's important and fun about it!"

The MOUT exercise, conducted live at the Zussman Urban Combat Training Site, replicated possible real world urban environments. The intent was to provide approximately 60 lieutenants and 28 captains the opportunity to solve complex problems in a MOUT environment. Platoons, led by captains in leadership positions, rotated through movement to contact, hasty defense, and hasty attack missions. Paintball added needed realism and pressure on leaders to execute well. Paintball also provided a gauge to judge soldiering skill, something not provided by MILES gear or blank ammunition.

Training is changing at Fort Knox. It is evolving from a focus on knowledge to a battle-focused experience generating multi-grade, multi-echelon training. The lessons learned and the methodology established from these training events will be used to improve future events, making each one a progressively better learning environment. Captains, lieutenants, and NCOs for the first time will train with and learn from each other. Learning will come from battle and victory, and evaluations will be based on the battlefield. Students will be allowed to demonstrate the adaptive and innovative decision-making skills essential to deal with our technological future. They will develop into bold, confident, tough, and battlefield-savvy soldiers who can lead from the front and think fast in the heat of combat. They will be trained to handle uncertainty, weigh probabilities, and accept risks. The Armor School will train them as they will fight.

2LT Humayun S. Khan graduated from the University of Virginia in 2000 with a degree in psychology. After graduation, he served on the Land Nav Committee at Advanced Camp 2000, Ft. Lewis, Wash. for two months. After arriving at Fort Knox, he was assigned to the 16th Cav Regiment S3 shop. Currently, he is in AOB Class 01-02, due to graduate March 29th.

ARMOR Magazine to Move Across Post...

...But Memories of Building 4401 Will Linger

by Jon Clemens, Managing Editor

For almost a year, bulldozers were working all around the John Lannen House, the *ARMOR* office building on Vine Grove Road. The two-story brick buildings that used to be the Gaffey Heights Housing Area are now gone, knocked down and trucked away, and a summer crop of weeds covered any evidence that thousands of military families once lived there.

ARMOR Magazine is moving across post to new quarters. Now the bulldozers await, and Building 4401 will be the next to go. It is a building with memories.

The John Lannen House was named for the 3rd Cavalry sergeant who posed for artist Frederic Remington's sketch of a mounted cavalry trooper, circa 1898. The sketch for many years appeared on the cover of the old *Cavalry Journal*, our predecessor. *ARMOR* moved into Building 4401 in 1973, when then-editor, LTC Burt Boudinot, moved the magazine here from makeshift offices in the old Weapons Department near the Armor School. He'd asked MG George S. Patton, then Assistant Commandant, for a better location, and the general's wife suggested then-vacant Building 4401, which had served as a billeting office and a nursery school. Aside from the security grilles added to the windows, it was a homey sort of place, more like a suburban house than a place of business. This impression was reinforced by the kitchen sink and cabinets, the '50s-era pink and black tile motif in the upstairs bath, with its full tub and shower, and the rolling lawn outside.

For more than 25 years, the staff edited the magazine here, from story acceptance to typesetting and page layout. But along with the serious stuff, working at Building 4401 had its lighter moments. The big bathtub, for instance, played a key role in a legendary incident back in the late 1970s, when the Editor-in-Chief stopped in on a Sunday morning to retrieve some papers he'd forgotten to take home. As he came in the front door, he heard rock and roll on the radio and splashing sounds upstairs. It was a member of the staff, frolicking in the tub with his date of the night before. Suffice to say, counseling followed about responsible use of government property.

There was a narrow 50-foot strip of lawn between the *ARMOR* office and the first unit of the adjacent housing area, but this was not enough distance to separate us from an enlisted couple we came to call the "Battling Bickersons." Their marital discussions were always conducted at a scream, and were public information, winter and summer, with windows open or closed. On more than a few occasions, the "Bickersons" took their disagreements out to the front lawn. We'd call the MPs, then go live to the lawn to watch the wrestling as the Bickersons, in their camos, rolled around until the law arrived. Needless to say, it was a different Army then.

Families rotated in and out of the housing area all through the Cold War, leaving us with many memories...and occasionally a pet who missed his DEROS. One of these was a large gray tabby who appeared on *ARMOR's* doorstep one morning, walked in with a customer, and decided to stay. He became our mascot for many years, dubbed "Sherman" for his rolling, determined way of walking, suggesting the WWII battlewagon of the same name.

It was hoped that Sherman might make a contribution by dealing with a particularly industrious gang of squirrels who had infested the building, but Sherman preferred wolfing down Friskies and sleeping on our desks, usually on his back, four paws up.

One morning, he was in this "hull-up" position on Vivian Oertle's desk, in full view of the front door down a long hallway. A tough-looking colonel,

***ARMOR's* new home will be in Building 1109, flanking Brooks Field on Fort Knox's Main Post. The offices will be on the third floor of the northeast wing, at upper left in this photo.** Photos by Robert L. Stevenson

replete with cigar stub and right out of Central Casting, swept in and spotted the inverted, snoozing cat. Before he'd even said hello, the O-6 marched down the hall to Vivian's desk, stopped, and started scratching the cat's belly. Sherman blinked, stretched, purred, then went back to sleep.

"What a *great* cat!" said the colonel.

A great cat perhaps, but a pacifist. He coexisted peacefully with the squirrels and with a squadron of barn swallows that made our front porch home every spring, arriving, nesting, and flight training in the busy weeks before Armor Conference in May. One by one, the young birds would mount the parapet of the nest. The adults would fly nearby, encouraging them to take the leap. Finally, reluctantly, they would. Except for one guy we called "Bolo," who resisted all peer pressure to act like a bird, staying in the nest about a week after the others had graduated. While we were at lunch, he made the leap and apparently didn't take to flying. He was on the sidewalk walking around when we got back. One of the editors picked Bolo up and air-evaced him back to the nest. He must have changed his mind later, because he was gone by closing time, a late bloomer.

In the early '80s, the staff was gathered in the editor-in-chief's office one afternoon when an Ohio Valley thunderboomer began outside. He was on the phone when a lightning bolt hit the phone lines, fried the entry box, and zipped into the phone's ear-piece. The phone flew one way, the lieutenant colonel's office chair the other...with him in it. He jumped up and began hopping on one foot, the zapped ear down, his finger jabbing it as if he were trying to free a water bubble after diving. Although his hearing was pretty dim for the rest of the day, no permanent damage seemed to have been done (although the officer in question did take a public relations job upon retirement).

Although our building is marked for destruction, these memories will survive. We're moving on to Building 1109, where we'll occupy the top floor of the wing on the northeast end. This three-story brick structure, once the home of the 1st Cavalry in the early days of mechanization, has recently been restored. Along with the new fiber optic connections and energy-efficient windows and modern lighting, they've kept the best of the old building, restoring the arched brick porches on the back side, and the gray travertine marble in the rest rooms. The new free-standing elevator shaft at the rear of the building, needed to meet accessibility standards, was constructed of brick in a style that matches the old building.

Inside, the refinished walls and floors are set off by new oak doors and woodwork, and all of the halls in the building will feature Jody Harmon's artwork for *ARMOR*, enlarged and mounted in matching oak frames. The office area, which we'll share with the U.S. Armor Association, will include a reference library and a large production workroom, offices, and a reception area. It will be a big improvement.

As we go to press with this edition, it's unclear exactly when the move will come, but current plans call for early April. Our phone numbers at the new location are not supposed to change. When the move is set, we'll post details on the magazine's web site.

The magazine is also making another move, this one organizational. We have been reassigned to the Office Chief of Armor, which is also located in another wing of our new building.

In Vietnam, a sequential approach at the strategic level was not necessarily the cause of casualties. Not knowing the enemy situation was. The Ia Drang Campaign was the first major employment of the airmobile 1st Cavalry Division against three regiments of North Vietnamese Army (NVA) regulars well prepared on the Chu Pong Massif. While the U.S. earned a tactical victory based on 3,000 NVA KIAs and an estimated 1,000 WIAs, the likely strategic victory belonged to the Communists. Although the cost would be great, they learned they could hold their own against the Americans and our new vertical battlefield mobility. Eventually, strategic victory was theirs. History tells us that American casualties occurred largely for three reasons. First, the enemy expertly concealed his positions and movements. Consequently, he knew more about us than we did about him. Second, he was a master at jungle warfare. Last, we never fully appreciated the enemy's dogged willingness to accept horrendous casualties and keep fighting no matter what the cost. We were willing to operate in lethal contact in order to gain information about the enemy in hopes of developing the situation and then conducting decisive operations.

The attrition approach to war illustrated in these two examples placed a premium on the four traditional elements of combat power: maneuver, firepower, protection, and leadership. Even perfect synchronization of these four factors was not enough to gain prompt victory because they were applied in environments where the commander lacked true situational awareness and understanding (SA/SU). Simply put, commanders need accurate information (especially about the enemy) to escape the attrition that accompanies sequential operations. Thus, information *becomes* the fifth element of combat power, not simply the *goal* of its application. With the true situational understanding that comes with information as a controllable element of combat power, leaders no longer have to accept high casualties and sequential operations in order to gain information about the enemy. The key to truly revolutionizing warfare, to escaping the tyranny of sequential operational attrition, is to leverage information as a full element of combat power, one the commander has enough control over to synchronize his operations. For the first time in history, we are beginning to see that digitization can make accurate friendly and enemy information a powerful element of combat power, instead of an elusive ghost that ultimately exacts high casualties. Our developing Force XXI formations in III Corps and the upcoming division capstone exercises involving the 4th ID (M) will continue to nurture this transformation.

Emerging 21st century warfighting concepts take advantage of information as a key element of combat power. Light, highly deployable, tactically mobile, lethal, and survivable platforms like the Future Combat System (FCS) and the Future Transport Rotor Craft (FTRC) are now recognized as materiel keys to future combat success. While *protection* is still vital, it will no longer be the single preeminent factor it was in the forced attrition style of fighting. With SA and SU on our side, maneuver — especially out of contact — with its attendant flexibility and unpredictability, will dominate 21st century operations. Information superiority (IS) will empower us to mass fires and effects, not units and weapons platforms. We will execute focused, high volume fires from distributed locations. Thus, our doctrine can now begin to transition from a sequential force build-up scenario to simultaneous entry at multiple operational and tactical locations and immediate execution of decisive operations.

This simultaneous, rather than sequential, approach to combat operations will now be possible because IS will yield true SA/SU. Internetted units will be able to distribute formations for protection while being able to quickly concentrate fires for maximum effect. At the strategic level, force build-up will be rapid with the simultaneous multiple entry points afforded by FCS/FTRC. In sum, our doctrine will emphasize overwhelmingly simultaneous operations. (Figure 1) instead of the predictably linear and sequential operations of the past. (Figure 2)

Tactically, we will be able to develop the situation and maneuver the force *out of contact*, drastically reducing casualties and saving combat power for decisive operations. Initial contact will be lethal with decisive fires at the time and place of the commander's choosing. The commander's assessment of the best way to achieve victory will determine what course of action to take,

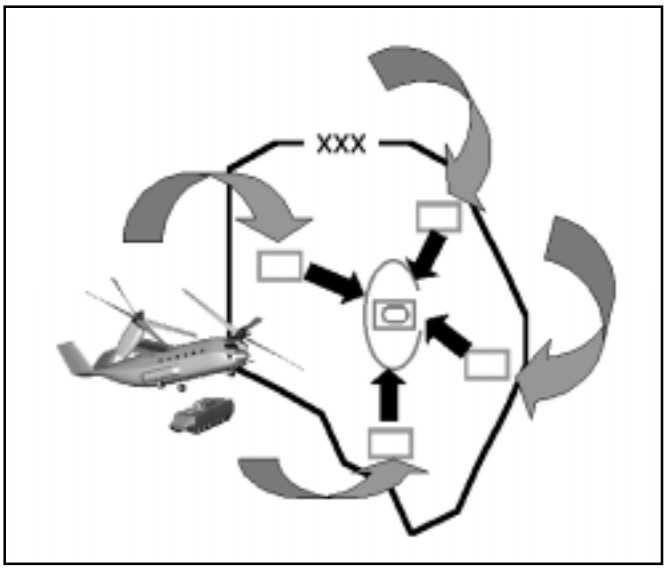

Figure 1.
New Simultaneous Approach

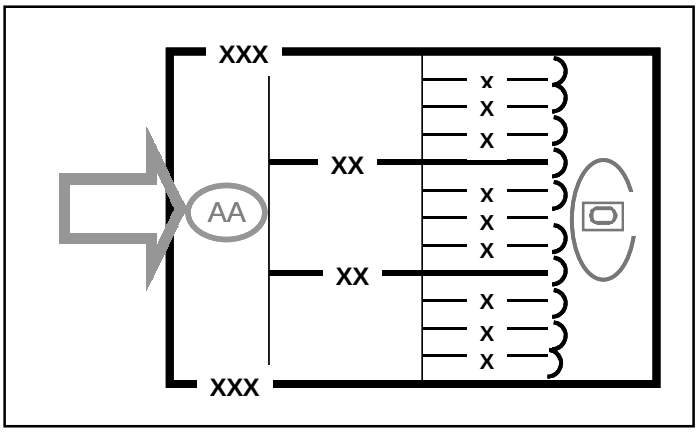

Figure 2. Old Sequential Approach

not the need to gain costly information about the enemy.

Like the wide swath cut by a broad axe, the commander will be empowered to attack simultaneously and decisively in a myriad of ways that the enemy cannot predict. This is a decided improvement over the old approach, which invariably directed all efforts to one sequential, and thus predictable, option — the tip of a very long spear. And let there be no doubt that while all five elements of combat power will be crucial in this new environment, *leadership* will remain the centerpiece and be more important than ever.

For our leader warriors, four leadership characteristics will be critical. *First, our future leaders must be historically grounded.* As information superiority provides greater and greater situational awareness and understanding, we will experience a quantum leap in combat effectiveness against opponents still laboring under the old constraints. Simultaneous operations will demand an intellectual agility best developed by studying military history. It will provide a knowledge base for the profession of arms. Camaraderie and trust are most effectively developed when all understand the common heritage they share. Leaders will also have a true appreciation of the high costs and inflexible options dictated by the old sequential operations. Only by understanding where we've come from can future leaders completely appreciate the increase in combat effectiveness afforded by an army operating simultaneously rather than sequentially. Most importantly, the study of history hones analytical skills to a sharp edge. Future leaders probably won't remember that Lt. Col. Robert B. Tully commanded the 2d Battalion, 5th Cavalry on 16 November 1965, when they landed at Landing Zone Victor in the Ia Drang Valley. They will remember, however, the critical thinking skills they developed while writing a research paper or presenting a battle analysis on the Ia Drang operation.

Despite our best automation and filtering efforts, information and intelligence will bombard leaders on the simultaneous battlefield. Only those well grounded in the study of the history of the profession of arms will have the intellect necessary to separate the essential intelligence from the supporting information.

Second, leaders will be innovative and adaptive, two further keys to success on the simultaneous battlefield. Choices will never be black and white. Despite our best efforts, friction will still be rampant. Information will not be perfect. Only creatively innovative and adaptive leaders will overcome the confusion and be successful.

Third, our future leaders must subscribe to the Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage. Simply put, only those who live by a values-based system will have credibility with their subordinates. Information superiority means our *soldiers* will likely know much of what their *leaders* know. They will have to trust the leader's decision in a knowledge-based environment. How does a leader motivate someone to assault a position when everyone knows, in real time, more or less how strong the enemy position is? Among other things such as tactical competence, I believe it will be by the credibility a leader builds by living his life within a values-based system.

Finally, the future leader must be decisive — now more than ever. Simultaneous warfare promises to be just as violent and chaotic as sequential warfare — perhaps more so. A leader who wavers and loses confidence in his decisions will quickly be overcome by the rapid tempo of simultaneous warfare. Even worse, his subordinates will sense his timidity even more quickly in the IS environment. General Stonewall Jackson's sage advice to "never take counsel of your fears" will be even more critical.

Information superiority promises a true revolution in maneuver warfare. It is a key hedge in our continued quest to ensure our overmatch of potential enemies. Today's lieutenants and captains will lead our Army into this environment. We're at the brink of escaping the tyranny of attrition warfare and the catastrophic risk and suffering it entails. With information superiority in our grasp, a bold shift to simultaneous doctrine coupled with key materiel advances, and applied by adaptive, values-based, leader warriors ensures the future mounted force will continue to be the cutting edge of the Army's ability to prosecute decisive warfare. Information superiority is indeed everything it's cracked up to be — and then some!

FORGE THE THUNDERBOLT
AND STRIKE FIRST!

The Field Problem Review Board

from Page 37

Additionally, the logisticians plan the implementation of any modifications to the fleet resulting from solutions coming out of the FPRB.

The engineers of Team Abrams evaluate and design the fixes for problems coming from the field, and continuously evaluate new technologies to determine if they can improve the safety, reliability, availability, maintainability, and performance of the vehicles and their sub-systems.

The officers and NCOs of TSM Abrams also provide input. They provide a "sanity check" to ensure the fix to a problem passes the common sense test and will withstand use by soldiers in the field. They also act as a conduit, focusing attention on problems in the field based on their visits to units.

A final, but also most important, source of information about problems in the field is the soldier himself. The FPRB has three telephone numbers, 800-989-TANK, 800-989-8265, and 810-825-5259. Any soldier can call and leave a message regarding any problems they are having with either the Abrams or the HAB. When calling these numbers, soldiers should leave a short message describing the problem they are experiencing, their unit, their rank and name, and a number where they can be contacted for follow-up. An alternate solution is to go to the Team Abrams web page at *www.tacom.army.mil/gcss/pmabrams.* You can also email MAJs Carson or Finn, the M1A2 and M1A1 team chiefs for TSM Abrams, at:

craig.carson@knox.army.mil

dennis.finn@knox.army.mil

After each meeting, the FPRB publishes its minutes and sends a copy to every Armor/Cavalry battalion, heavy brigade, and heavy division commander and executive officer in the Army. The minutes are also available on the III Corps LAN in the public folders under "PM Abrams."

Deployable Vs. Survivable

from Page 14

those who do not learn from history are doomed to repeat it. Valuable lessons can always be learned from all combat operations, especially when those combat operations result in the development of new vehicles. All combat operations result in someone having to pay the "butcher's bill," and all soldiers would rather have the bill paid by the opposition.

Notes

[1]"Army Announces Vision for the Future," (Army Public Affairs, 12 Oct 99).

[2]Ibid.

[3]Ibid.

[4]Gary Sheftick and Michele Hammonds, "Army selects GM to make Interim Armored Vehicles," (Army News Service, 20 Nov 00).

[5]*Janes Defense Systems Modernization*, May 99.

[6]Lester W. Grau, "Russian-Manufactured Armored Vehicle Vulnerability in Urban Combat: The Chechnya Experience," (*Red Star Thrust*, Jan 97).

[7]Timothy Thomas, "The Caucasus Conflict and Russian Security: The Russian Armed Forces Confront Chechnya III. The Battle for Grozny, 1-26 January 1995," (*Journal of Slavic Military Studies*, Vol. 10, No. 1, Mar 97), pp.50-108.

[8]MAJ Gregory J. Celestan, *Wounded Bear: The Ongoing Russian Military Operation in Chechnya*, (Foreign Military Studies Office, Aug 97).

[9]Thomas, pp.50-108.

[10]Grau.

[11]Ibid.

[12]Eugene Yanko, "The Tank Becomes an Armored Personnel Carrier," (Russian Weapons Catalog, *www.weapons-catalog.com*).

[13]Russian Weapons and Military Technologies CD-ROM, BTR-T on the base of the T-55 tank/Exhibits, H-APC (BTR-T)/Exhibits, Scout-patrol vehicle/Exhibits, (VTTV-Omsk-99, Nov 99).

[14]Anatoly Ilyin, "Tank Support Combat Vehicle," (*Military Parade*, Sep 00).

SFC Ira L. Partridge received his initial Armor training at Fort Knox, Ky., in 1985. He graduated the Master Gunner Course in 1993 with an A8 ASI. His assignments as a master gunner include one year as a company master gunner and three years as battalion master gunner for 5-77 AR, 1st AD, Mannheim, Germany, moving with the unit in 1994 and re-designating to 1-32 AR, 2nd ID, Fort Lewis, Wash. He is currently serving as the newsletter editor, webmaster, and operations sergeant for the Master Gunner School at Fort Knox, Ky.

CSM Role

continued from Page 26

This is easily accomplished with existing CSMs who go to the NTC for periodic rotations. They operate with an existing team sergeant major or independently after completing the Observer Controller (OC) Academy. This is accomplished in conjunction with their unit's Leader Training Program (LTP). Everyone benefits from this initiative and the cost is minimal.

The Army has the ability to begin to better set up CSMs for success by immediately restructuring the CSM Course from one to two weeks and training the leader tasks discussed here. They should provide an exportable leader teaching program for major commands (MACOM) and begin the close examination of the program of instruction at the United States Army Sergeants Major Academy. Training and Doctrine Command (TRADOC) has the unique ability to incorporate the training observations from the NTC, the course developers at the USASMA, and service school doctrinal writers. We have the ability to utilize the NTC OC Academy and the FORSCOM LTP to place trained, experienced coaches, teachers, and mentors in the world's best training environment.

We are in a period of great changes in the Army. These changes cannot be limited to equipment and information technology. They must include changes in the Army's most important resource — soldiers — and specifically the CSM. These changes, in consonance with the Army's process of rebuilding itself, will better leverage the abilities of unit CSMs and more effectively enable units to train, deploy, stabilize a situation, enforce peace, or win in decisive combat.

CSM Jim DePriest is a graduate of Class 36, USASMA. He has served at the battalion, squadron, and brigade level as a CSM. He has five rotations to the National Training Center as a CSM. He holds a B.S.L.A. from the University of the State of New York. He is currently the CSM for 1st Brigade, 4th Infantry Division.

COL Randy Anderson is a 1975 Distinguished Military Graduate from Stephen F. Austin State University. While in command of 2-68 Armor, Baumholder, Germany, he deployed to Kuwait for Intrinsic Action 95-03 and to Bosnia-Herzegovina as IFOR of Operation Joint Endeavor. He is currently the commander of 1st Brigade, 4th Infantry Division.

The Readers Respond

"An Infantryman's Thoughts on Armor"

Dear Sir:

Interesting article by MAJ Bateman ("An Infantryman's Thoughts on Armor"). I find it interesting that with such a strong opinion he of all people seems to miss the mark on the addition of the medium weight vehicle to the force. Notice that I did not say transition from M1A1. MAJ Bateman's points on logistics and force projection are quite valid. We are heavy and require a lot to sustain. This is nothing that the heads of the armor community haven't said repeatedly in this very publication. There is a plan for addressing these things and it is called the Future Combat System, not an interim weight vehicle.

I would rather focus on the role that MAJ Bateman thinks Armor has on the battlefield. First and foremost, I think that most soldiers place a high priority on survival. I certainly do. The idea that survival is some sort of an afterthought just doesn't register here. Let's win the fight and come back home. Just a thought. There is something that you get that accompanies that rather substantial amount of steel that you have wrapped around you in a tank. That is the knowledge that although you are not invincible, it does take a lot to destroy you. This translates to confidence and aggressive actions on the battlefield that are critical to success. I wasn't in the Army when Desert Storm began, but I think the number of casualties would have been a little bit higher without the M1A1 in the fight. Protection does matter. There is a reason that we have different branches/MOSs in the Army. To attempt to place the role of Armor into the same category and apply the same criteria to Armor as Infantry would be a big mistake. I applaud you for stepping into battle with your "BDU Armor" but you are not asked to accomplish the same mission with your BDUs and Javelin as I am. The protection that means jack **** to you means something totally different to me. It means that if needed, to help you in a time of need, I can raise risk and lessen caution as I close with and destroy the enemy that threatens you because I know the capabilities of the armor around me will allow me to act a lot more aggressively than I would if I were in a Bradley or an LAV.

For the record I'll summarize this whole heavy/medium/light thing. The Army identified a need to get more firepower on the ground quicker than we can with the M1 tank. The interim weight vehicle bridges a gap that was clearly there and addresses rapid deployment issues and should help in places where maneuvering a tank would be impractical. The next generation of tank will continue to do most of what the M1 does. It will have the lethality of an M1A1, more protection than a LAV, and be lighter and more deployable. Ideally, it will allow us to maintain the boldness and audacity that is inherent in Armor and Cavalry right now. No need to feel sorry for tankers. We're pretty happy with where we are and where we're going. We'll be there when you call.

ROBERT P. ASHE
CPT, AR
USMA AR Branch Rep

Armoring the Infantry Recalls Success of WWII

Dear Sir:

I wish to comment on the diatribe against heavy armor by Major Bateman, "An Infantryman's Thoughts on Armor," that appeared on pages 11-12, *ARMOR*, Jan-Feb 2001.

The only part of the article that I agree with is his conclusion's opening sentence, "To make a weak historical point…" I concur that it is weak. It is also out of context and flat wrong. MAJ Bateman's argument that the Germans were winning when they had lighter tanks (Mark II, III, and IV) and losing when they had heavy Panthers and Tigers is obnoxious, and he should know better. He ignores the doctrinal and operational concepts under which the opposing forces fought. He also ignores the fact that Allied tanks improved and were vastly superior to earlier models.

But let me hit the real issue concerning "Transformation," which has nothing to do with gun tube elevation, vehicle maintenance, fuel consumption, or anything else concerning the Abrams MBT. The real issue is that light infantry is too light.

Look back to Reorganization Objective Army Divisions (ROAD) that served us since the mid-60s. It was a direct carryover from WWII experience (disregarding the failed Pentomic Division, the Army's "Transformation" of the early '60s). The general purpose Infantry Division (Light) had organic tank and mechanized battalions, the exact number of each to be tailored based on METT-T. The division could be readily beefed up into an Infantry Division (Mechanized) by simply increasing the proportion of mechanized infantry battalions.

Two decades ago, the Army ignored all those lessons of WWII, scrapped this balanced organization, and created the Light Infantry Division (LID). This was a 10,000-man unit that regularly demonstrated an inability to even feed itself in deployments and exercises, much like its WWII predecessor. But it could deploy rapidly, so we made more of them.

Further confounding the effort to lighten the force, the Army repeatedly refused to procure a light tank to replace the Vietnam-era M551 Sheridan. I'd like to remind younger readers that the M8 Armored Gun System (AGS) that was type classified but then canceled in 1995 is essentially the same vehicle that was tested in the mid '80s but was never procured then, either. The AGS was the linchpin of the 9th Infantry Division's experimental and revolutionary 1980's High Technology Light Division (HTLD), sometimes derisively called the "Dune Buggy Division." Without AGS, the concept could not succeed, so the 9th ID was reorganized conventionally and subsequently deactivated before the deployment to Desert Shield and Storm.

So, in 1999, the new Chief of Staff of the Army recognizes that the light forces are too light, and determines to use new technology to develop a lightweight equivalent of the heavy force. His objective is a 20-ton tank with the survivability and lethality of today's 70-ton Abrams. Great idea! But now, it seems as though every "light fighter" who slept through the logistics planning portions of C&GSC wants to twist this into saying that we need to eliminate the heavy force TODAY and replace the MBT with a an APC with a cannon. That is utter nonsense.

The other point that has been totally obfuscated in "Transformation" debates is that the IBCT is essentially a mechanized infantry brigade equipped with a newer family of light armored vehicles. There are variants for infantry, engineers, mortars, antitank, air defense, command, maintenance, medical, etc., etc., just like the M113 family of APCs; like the family of halftracks of WWII, even!! In other words, discounting the mindlessly distracting debate of wheel versus track, the Army enters the 21st century having finally stumbled into the secret we mastered so well in WWII: "Mechanized (or Armored) Infantry." All that is missing is a suitable AGS, but this time, we might actually get one in the form of

the 105mm cannon-armed Mobile Gun System (MGS).

So I wish "Light Fighters" all the best in their quest to mechanize themselves so that they can bring more than backbreaking manpacked loads to the fight, and move faster than plodding at a foot marching pace. And with keen focused insight, hopefully they will design the vehicles of those mechanized battalions so that they can elevate against high targets and deliver precise, lethal fire in support of the accompanying dismounted and mounted infantry. And with that accomplished, I am fully confident that they will be able to deploy rapidly and bring a sufficiently lethal capability to meet most contingencies. And if need be, they will have sufficient combat power to defend and buy time for the heavy legacy force to deploy and enter the theater, where it can utterly destroy the threat that was impertinent enough to challenge the Armed Forces of the United States of America.

But so long as there remain thousands of modern MBTs, IFVs, APCs, and armored SP artillery in the hands of potential opponents world wide, I suggest that the rush to eliminate the Abrams, the best MBT on the planet, and castrate the U.S. Army's Armor is plainly misguided.

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

Survivability Looms as a Question In Army's Shift to Light Armor

Dear Sir:

I read MAJ Bateman's article in the Jan-Feb 2001 issue of *ARMOR*, and while I agreed with several of his points, I also disagreed with a couple... As I am a tanker, I guess that won't surprise you. As I understand it, the senior Army leadership intends to field some light "armored" brigades now and eventually mothball the M1 series of tanks (I'm still not clear if they intend to totally do away with all the heavy armor). First of all, the LAV III is more deployable, cheaper, and probably less maintenance-intensive; we'll soon find out. However, without the extra applique armor package, it can only stop a 14.5mm round. Now, I agree that we should be able to deploy quickly, and rapid deployment infantry units should be able to utilize armor, light or heavy, as soon as they're on the ground. LAV IIIs are clearly much more rapidly deployable than the M1 series. But I do think we need to use caution here. It seems we're so concerned with getting there fast that we're not thinking about what we'll face when we get there. Will China, Iraq, or North Korea sweat when they see LAV IIIs; probably not. It'll still be a speed bump, just a little bigger. The concern I have is that the threat will outgun us in the fight. A T-90, or T-62 for that matter, can chew through LAV IIIs, at most armed with a 105mm, just as easily as it can chew up crunchies.

I think it is good that the LAV IIIs will be able to go with infantry in a hurry. I do not think we should look to the LAVs to do any decisive fighting unless we know for sure that they will face no enemy medium to heavy armor. The problem is, sooner or later they will face enemy armor, and then what? We keep looking at the M1 and saying, well, it's not deployable. Have we taken a closer look at our means of moving it. Yes, aircraft wise, the Galaxy can take only one, but what about the naval mode?... What new ships are under development, specifically in the cargo transportation area? I think we need to consider this because, in my opinion, we will still need heavy armor for some time. Eventually, who knows what will transpire with the electrical rounds or lasers they're developing, but for now we need heavy armor and will for some time.

This leads me to another point, survivability. He says mission accomplishment is ranked ahead of survivability. He also says our armor protection doesn't mean anything to him. Come on, that's a good one! How many times does that armor provide cover for dismounts? Many. Also, I haven't read of too many dead soldiers accomplishing the mission. If tankers had to leave their tanks to join infantryman in a fight, we wouldn't need tanks, just more infantry.

There will always be situations or places where only infantry can go. That is what infantryman get paid for. I will tell you that tankers are entitled to more armor protection; that is the point. Our mission statement is to close with and destroy the enemy using firepower, maneuver, and shock effect. I love infantrymen, but they really don't shock that much. You get shock effect when you hear a 120mm go off and see that SABOT or HEAT utterly destroy something. I would venture that you get more shock effect when an enemy sees its main battle tank fire at and hit an M1 and watch in horror as their main tank killing munition sticks out of the front slope, the M1 turret turns and sends a 120mm greeting card into and through the other side of the enemy MBT. That is exactly when the enemy's will starts to falter, and when that happens, victory is not far behind.

That same will can only be strengthened at the sight of countless burning U.S. LAV IIIs and scattering U.S. infantry. In Somalia, the relief column was made up of HMMWVs and was decisively defeated. Senior Army leadership publicly regretted the fact that there was no U.S. heavy armor available to send to the Rangers. There have been incredible advances in anti-armor capability, specifically armor penetration and ease of use for the aggressor. That is a big problem for the LAV.

Finally, his historical example of Germany losing with the Tiger and King Tiger was very poor. The reason the Germans lost is not because their heavy tanks were not better. They were, although the 85mm T-34 was very good. They lost because they were being totally out-manufactured. The Russians and Americans were producing more that 10 tanks for every one the Germans were producing. The Germans also had too many models and so maintenance parts weren't universal at all. If the Germans had as many tanks as the Russians, we'd probably be speaking German now.

I can see why MAJ Bateman generates so much mail. The BLUF is, we're all on the same side and, though few will admit it, tankers need infantrymen as much as infantrymen need tankers. I guess we just disagree a little on what systems we use in our mutually supporting relationships. Again, maybe one day heavy armor will be a thing of the past, but for the next 10 years, I think we'll need it.

CPT MATT EICHBURG
HHC/2-8 CAV
1st Cavalry Division

Can Armor Guys Take Note, And Not Offense?

Dear Sir:

I am a tank battalion commander and I enjoyed MAJ Bateman's article in the Jan-Feb 2001 *ARMOR.* He has a great gift for prose and I do agree with his assessment. As an Armor officer for over 15 years, I have seen the day of the M1 come and go. My biggest issue with the M1 is the main gun storage capacity. As has been proven in many wars, but especially wars between Israel and Arab countries, the number of main gun rounds carried on tanks made huge differences in the outcome of small unit combat. I also agree with his assessment of mobility from a operational point of view. The M1 is horrible. As for fuel, I wish my checking account looked like my fuel account! I applaud him for his far-thinking article, I can only hope my fellow armor officers will take note versus taking offense.

KEITH D. LOCHNER
MAJ(P), AR, CAARNG
Cdr, 1st Battalion, 185th Armor

To "Complete the Mission," You're Gonna Need Tanks

Dear Sir:

On MAJ Bateman's article, I disagree with most all of it. The one smart thing in his article is that he knows that he will need armor....

Those light (armored vehicles) will not survive, and then who are you going to call? There is no such thing as too much firepower, accuracy, or protection, and I don't care how much fuel or support it takes; get it there, an infantryman's life depends on it. MAJ Bateman has fallen prey to the political correctness of not bullying these Third World countries into line. They are not worth one American life. He sounds like he wants to die for our country. I want to complete the mission and go home. (Remember GEN Patton, history teacher?) It takes survival to make that happen. It takes survival to complete the mission. Go ahead and get some sort of light gun system to keep your head above water 'til we get there... Bottom line is, it will still

take real tanks to complete the mission, no matter where or when it occurs.

TOD L. VANN
MAJ, AR, ALARNG
AO/S3 152d Armor

"An Infantryman's Thoughts..." Brings Praise and a Clarification

Dear Sir:

I just read MAJ Bateman's article in the Jan-Feb 2001 issue of *ARMOR*..... As an infantryman (light, airborne, heavy) of 18½ years experience, it was a refreshing viewpoint. Keep up the good work.

One minor point, and I do mean minor: my observation on why the Germans went with the Panther was because the T-34 was cleaning the clocks of the PzKpw IIIs and IVs. But I agree with MAJ Bateman; the Tiger wasn't the answer, they should have built a better medium tank to deal with the T-34 series. Anyway, great article!

LTC NEIL C. REINWALD, JR.
Commander and Professor
of Military Science
University of Alabama

LAV III's Armor Barely Exceeds Protection of Early WWI Tanks

Dear Sir:

"An Infantryman's Thoughts on Armor" is an interesting article. I want to address MAJ Bateman's points on armor, firepower, and maneuver. His basic point seems to revolve around strategic mobility and discarding enough armor to achieve it. My point is that without sufficient armor, a tank will fall out quickly after the battle starts or not be available at all. It will be a burning wreck. Armor allows the vehicle to move under fire on the battlefield and protects the crew.

The armor protection being discussed (on the LAV III) is about the same as on the British 1917 Mk IV tank. Artillery, the number one casualty producer, is far deadlier today and the firepower density higher than ever. The Sherman could survive 105mm artillery near misses and a hit any place but the engine deck. The thin armor now being looked at cannot survive a near miss by anything heavier than an 82mm mortar. A hit anywhere will destroy the vehicle. Every nation uses 105mm or heavier artillery. Look at the loss rate in infantry platoons. Operating in the same environment, light armor units will suffer very high vehicle and crew loss rates. Can the U.S. Army afford to replace vehicles and crewmen at the same rate as infantry? Can the U.S. Army deploy light armor units with as many vehicles as there are infantry to allow for the losses?

In discussing firepower, his basic point seems to revolve around terminal effects against buildings. My point is it must be specified what targets a tank is to destroy. If killing a tank with a frontal shot is required, you will need a gun (very heavy, huge recoil forces, low-cost, high-speed, small projectile, large variety of munitions, high rate of fire, large heavy vehicle), missile (light weight, no recoil, extremely high-cost, low-speed, large heavy projectile, single purpose warhead, single purpose launcher, low rate of fire, small light vehicle) or rocket (still in development, light weight, no recoil, medium-cost high-speed large medium-weight projectile, large variety of warheads, high rate of fire, small light vehicle). The gun is the best current answer to the firepower demand....

MAJ Bateman's basic point about maneuver seems to revolve around strategic mobility, minimal logistic needs, and bridge-crossing capability. My point is that strategic mobility is a matter of transport capability. Buy enough heavy lift aircraft and or preloaded high-speed ships with brigade sets and there is no problem. The only way to speed up current strategic transport, ease maintenance needs, supply consumption and bridge requirements is to lighten the tank. This limits the tank's armor (is it available?) and firepower (can it destroy the required enemy?). There is no light tank or armored car mounting sufficient firepower in the weight class of a loaded Hummer.

His historical points are very weak. The tanks being used by the Germans had nothing to do with why they won early in the war or ended up losing.... Between the wars, the Germans figured out what a tank had to do on the battlefield and how it had to operate internally. The British hobbled their tank development with railroad size limits and taxes on high horsepower engines. The U.S. Army Infantry Branch did no useful R&D up to 1936 because it had what it considered adequate tanks for a future war. If it had not been for General MacArthur authorizing the Cavalry Branch to develop combat cars in 1932, the U.S. Army would not have had a modern medium tank chassis at the start of the war. The U.S. Army did not get internal tank operation correct until the M1.

Until after WWII, a U.S. Army tank unit's purpose was to support infantry (a recurring point in the Bateman article). A German tank unit's missions were (and still are): attacking enemy armor, destroying heavy infantry weapons deep in the main fighting field, and destroying artillery, leader means, and supply.

The light armor of the Sherman resulted in over 900 having to be replaced between 6 June and 14 August in Normandy. Can the U.S. Army currently replace such tank and crew losses? With greater vulnerability, how can it be avoided?...

Major General William R. Desobry's 1972 Main Battle Tank Task Force established 19 design factors in a specific priority, based on historical data. I have yet to see any evidence the findings should change. The Bundeswehr's Keiler Study in the late 1960s found tanks that could not survive direct armor piercing fire would on average kill one enemy tank for each friendly tank lost. Being able to survive a hit altered the exchange ratio to 4 to 1 in favor of the heavier armored tank....

Only twice have U.S. Army tank crews gone into combat with state-of-the-art vehicles: the FT17 (a foreign design) and the M1. Look at what was achieved, and how low our losses were both times. Heavy armor forces are a deterrent to aggressor nations. Thus the aggressors turn to other less costly means against us. There are at least two nations with the manpower and money to develop a significant armor heavy threat in the next 20 years....

Is it possible for a light armored vehicle to be as effective as the M1A2SEP? Yes, but the technology is not currently available nor does the will to spend the money necessary to develop the hardware exist. To continue on the current road, the U.S. Army and the nation must accept the risk of not just defeat of the light mechanized force, but total destruction.

CHRIS SCHNEIDER
U.S. Army (Armor), Retired

* * *

Command List Corrections

The command list that ran with the Nov-Dec 2000 issue included several errors:

The commander of 38th ID's 37th Bde. is COL Matt Kambic.

The commander of 1-185 AR, 81st AR Bn. is MAJ (P) Keith D. Lochner and the CSM is R. Reynolds.

Some Road Wheels Defective; Most Failed from Wear, Neglect

An investigation into a series of road wheel failures at Fort Hood, Texas has determined that some failed due to material defects in the wheels, but the majority of failures were caused by normal wear or poor maintenance. The probe, by TEAM Abrams and personnel from the Red River Army Depot, blamed the majority of the failures on improper track tension and failure to keep mud from building up around the road wheels, which restricts their movement and causes uneven wear. Many of the failures occurred during the muddy rainy season at Fort Hood.

TACOM is publishing a Maintenance Advisory Message reemphasizing the need for proper track maintenance, and a booklet detailing track maintenance do's and don'ts will follow. Red River has also offered to provide special training on inspection procedures for tracked systems. At the Armor School, the subject is being reemphasized during preventive maintenance training.

Air-Mech Strike Force Proposal: Big Questions Persist

Air-Mech-Strike: 3-Dimensional Phalanx by the Air-Mech-Strike Study Group (Airborne)*, Turner Publishing Company, Paducah, Ky., 2000, 312 pages, $24.97 hard bound.

Flip this book over to the back cover and you will see that some real heavyweights have contributed glowing blurbs. They exhort the unsuspecting to "Read this book… a must read… a monumental work… the authors are worthy successors to [Gavin and Howze]." I can only conclude that these distinguished gentlemen either did not actually read the book, or are far less discerning than I previously had thought.

This study does, in fact, contain the kernel of an intriguing notion: that we have the technology and resources now to create an airmobile mechanized force capable of tactical, operational, and even strategic maneuver. Moreover, we could and should begin developing a future force that exploits mechanized airmobility, using advanced helicopter and wing-in-ground technology to deliver future combat systems tailored to their airborne carriers. The ultimate vision is of huge aircraft deploying across oceans with an armor task force of 20-ton future combat vehicles, crews, and infantrymen in its belly. As these are discharged, a fleet of full-tilt-rotor 'speed cranes,' self-deployed from continental bases, picks up tanks, IFVs, crews, et al, and flies them directly onto the objective. At the LZ, the task force deftly disengages from its carriers and rolls across plains/mountains/jungles/towns to tear into a stunned and reeling enemy.

In the nearer term, the authors argue, the Army should forget all this IBCT nonsense. For considerably less cost, we could equip Air-Mech-Strike (AMS) battalions with a mix of off-the-shelf M113A3 and German Wiesels that could be airlifted by the current helicopter fleet. Suitably equipped with a mixture of weaponry and sensors, these would provide a third dimension of maneuver for every brigade — a proposed heavy division would have three brigades, each with an airmobile cavalry squadron and AMS battalion, alongside 'legacy' BFV and M1 battalions.

Neat stuff, to be sure, and … maybe… feasible. But if the authors are to be complimented on forwarding an imaginative solution to the perceived problem of an Army grown too heavy for its own good, they must also be condemned for a poor argument shoddily presented.

While the book is chock-a-block with tables of organization, vehicular vital statistics, and quotes from Sun Tzu, there is precious little discussion of logistics or tactics. Yes, it may be possible to airlift a battalion of four-ton 'armored' vehicles armed with machine guns, Javelins, and grenade launchers deep into the enemy's rear, with scouts mounted on ATVs or motorbikes. In some situations, it might even be desirable, but the authors do not make a convincing case for it. In the handful of pages dedicated to tactics, they state that an AMS commander requires "an expanded over-match in tactical awareness" to "defeat 80 percent or better of his opposing force through over-the-horizon indirect fires from precision munitions." Of course, if we could do that, the need for maneuver, airmobile or otherwise, would be virtually eliminated. The enemy, needless to say, is conveniently blundering about in massed formations or crouching passively in buildings and trench lines.

Logistics is treated even more cavalierly. The effort to refuel, rearm, man, and maintain a mechanized battalion by air in all weather, while that battalion is fighting and maneuvering through the enemy's rear, is simply not addressed beyond the vaguest generalities.

The authors are also enamored with a wide variety of toys to supplement AMS mobility. Some have real value — like the mechanized mules described to help move the infantryman's ever-expanding load. Others have been considered and discarded by the Army in the past, for very good reasons. The Flyer 21, for example, is basically a dune buggy with weapons appended. It, along with scout motorbikes and ATVs, are neither survivable nor reliable enough for combat service, a fact determined during the mid-80's flirtation with the high-tech motorized division. One suggested weapon even caused me to flash back — the Elevated TOW System, mast-mounted, electrically-driven, and carried atop a light armored vehicle for crew protection. Remembering my service with the late, unlamented ITV, I had to take smelling salts and lay down for an hour.

Finally, the authors would like to compare their efforts to the Howze Board, which formulated plans for the air-mobilization of infantry, and to draw upon history to show that AMS is the inevitable next step in future warfare. As Bernard Brodie said, "The phrase 'history teaches,' when encountered in argument, usually portends bad history and worse logic." That is certainly true here.

And it is history that the authors must overcome in their efforts to convince the Army that their vision is correct. No air-delivered land force, with one exception, has ever scored an operational success (and there are damn few tactical successes to note, for that matter). The one exception was the German capture of Crete in 1941, an operation, by the way, that so gutted the elite Nazi Airborne that it was never employed operationally again. The AMS Study Group may have the germ of a great concept, and they have certainly outlined 'what' can be done, but this book will leave skeptics unconvinced as to 'why' it should be.

LTC STEVE EDEN
16th Cavalry Regiment
Ft. Knox, Ky.

**Turner Publishing lists the following as authors of the study: David L. Grange, Huba Wass DeCzege, Richard D. Liebert, John Richards, Michael L. Sparks, and Charles Jarnot.*

Triumphant Fox: Erwin Rommel and the Rise of the Afrika Korps by Samuel W. Mitcham, Cooper Square Press, New York, New York, 2000, 224 pages, 8 maps, $17.95.

The Desert Fox continues to cast his long shadow over the military history field with Samuel W. Mitcham's new book about Field Marshal Erwin Rommel, the latest in a continuing historical controversy. David Fraser's recent best-selling book lauded Rommel's life and military exploits, but numerous military historians have countered this view with serious — sometimes scathing — criticism of Rommel's military abilities. They cite his inability to grasp the operational and strategic realms of warfare as fatal flaws, rendering his tactical prowess as nothing more than good feed for the Nazi propaganda machine.

The attacks leveled against Rommel, Mitcham contends, stem from a recent trend in the history field to "cast stones at the individual who stands head and shoulders above the crowd." In short, Mitcham believes that Rommel deserves the hero status heaped upon him by Hitler and Churchill alike.

The Triumphant Fox begins with a brief chapter detailing the events leading up to Germany's involvement in North Africa. Then Mitcham retraces Rommel's career, beginning in the WWI Italian campaign, then his years at the Infantry School during the interwar years, his observations as Hitler's aide about the 1939 campaign in Poland, and his command of the famous 7th Panzer "Ghost" division in France in 1940.

Rommel, who relied on experience rather than intellectual theory, had been extraordinarily successful as a junior infantry commander in WWI. Mitcham astutely points out that those experiences showed him that if he trained his units hard enough, he could push them relentlessly and count on the fact that

his enemy would break before his troops collapsed from exhaustion. This thinking shaped his tactical and operational decisions as a panzer commander in the invasion of France and had a great deal to do with his command philosophy in the African theater. This might account for Rommel's lack of concern with logistics and fuel supplies during that campaign.

Coverage of the African campaign is relatively narrow in scope, extending from early 1941 until the New Year of 1942. In the introduction, the author explains that this is his third volume in an ongoing study of Rommel's campaigns. He sets out to depict Rommel's opening campaign in Africa fairly, emphasizing his achievements and prowess while acknowledging his shortcomings. Rommel's initiative upon arrival paid huge dividends and far exceeded Hitler's expectations as he drove the English all the way to Egypt and surrounded the fortress of Tobruk. He skillfully depicts Operation "Battleaxe," and illustrates that Rommel not only could master the attack, but deftly defend and counterattack with devastating results. Mitcham does level criticism at Rommel for his tactical decisions at the final battle of Sidi Rezegh, which ultimately forced Rommel to withdraw his siege of Tobruk. Sidi Rezegh ended Rommel's first campaign in Africa, and Mitcham closes his book with Rommel's well-orchestrated retreat.

Mitcham's prose is concise, yet descriptive. This compact book probes deeply into Rommel as a commander, soldier, leader, husband, and citizen, providing a good picture of Rommel's personality, rather than giving us only a drab rundown of his battlefield exploits. By getting to know the man, Mitcham allows us to better understand his military decisions. While his analysis of Rommel's temperament as a commander is good, it could have gone further. Sometimes Rommel's initiative, had it not been successful, could have been considered insubordination, and could have cost him dearly. His unrelenting pressure on his direct subordinates sometimes crossed the dangerous line of stifling the very initiative he prized. Mitcham could have explored the duality of these traits more fully. While Mitcham does not praise these characteristics, he could have explored them further, including their negative impact. The author uses a wide variety of primary sources, sprinkled with sufficient secondary sources to provide him with a wide range of perspectives on his subject.

In a final analysis, Mitcham achieves his objective of rebutting Rommel's critics: his tactical genius more than made up for his operational and strategic deficiencies. Without falling in love with his subject, Mitcham portrays Rommel for what he really was: perhaps the greatest tactical military mind of this century, though not without his shortcomings.

2LT SAM COOK
Ft. Knox, Ky.

A Hundred Miles of Bad Road – An Armored Cavalryman in Vietnam 1967-68 by Dwight W. Birdwell and Keith William Nolan, Presidio Books, Inc., Novato, Calif., 2000, 218 pages, soft cover, $17.95.

The "bad road" is Highway 1, the main supply route from Saigon to the Cambodian border. The experiences are those of the co-author, Dwight W. Birdwell, who is a tanker in Troop C, 3/4th Cavalry, 25th Infantry Division. The mission is convoy security, "running the road," and the unit uses M48A3s and M113 APCs. The enemy, the VC, relies on guerrilla tactics and roadblocks, only once attacking in force before Tet.

Birdwell is a Specialist 4th Class who started out in a tank crew as a gunner. But in Vietnam, the targets are so close that no gunner is regularly needed: the tank commander just points the tube and fires it himself, and the gunner sits on top of the turret with an M16 or M79 grenade launcher to help return fire while the loader keeps the rounds coming.

Tankers used sandbags for protection from fire and hung runway matting on the sides of the tanks to take the first hit from any RPGs. The rules of engagement allow for return fire only when fired upon, and breaking the rules of engagement, like firing without permission, is a constant worry, especially for career people.

On January 31st, 1968, word comes over the radio that there's a squad of VC breaking into the wire at Tan Son Nhut Air Base. Two platoons, including Birdwell's, are dispatched. This was no routine incursion, but the beginning of the Tet Offensive. What those tankers really faced was the 271st Regiment, 9th VC Division.

A ferocious battle begins, the point platoon is knocked out, and Birdwell's platoon is badly hit. When his tank commander is severely wounded, Birdwell takes over the tank and, after a short time, his is the only tank returning fire. This is a heart-pounding battle account.

Birdwell fires the main gun himself from the cupola using an improvised lanyard so he doesn't have to drop down into the turret to fire, and fires everything available from HEAT to anti-personnel canister rounds, as well as firing the .50 caliber cupola-mounted machine gun. At one point in the course of the battle, Birdwell can't understand why his driver won't respond to his commands, only to find out later that his own microphone has been shot off the side of his helmet by the intense enemy. After Birdwell exhausts all 90mm rounds and has burnt out the barrel of the .50 caliber, he continues firing with his M16 and finally orders his crew to abandon the tank when reinforcements arrive.

After Tet, everything deteriorates. Discipline and morale fail, and the platoon no longer functions as a unit. Birdwell attributes this to the depletion of the professional NCO corps, and the turnover of personnel from casualties.

Birdwell also says that, by that point, everyone had realized that we weren't trying to win the war anymore and the enemy wasn't quitting, so survival became the main effort after Tet. Drug use and racial tension develop, as they were developing in the States at the time. Morale suffers from reports of anti-war protests and troopers felt abandoned. Some begin abusing citizens. At one point, Birdwell tries to intervene when an old man is being interrogated and beaten, and tries to stop the beating of some other prisoners, but instead gets beat up by our own people. As well as showing great courage, Birdwell seems a very decent man who comes through the war with his integrity and beliefs intact.

Birdwell finds it hard to believe how disconnected some senior officers are from the troops in the field and what they face. A new division commander actually orders the troopers to remove sandbags and runway matting from their tanks and wants the turrets shined with diesel fuel!

Finally, Birdwell has had enough. While he had been thinking of staying in the Army, he now wants out. He experiences an incredible number of close calls, and not just in combat. When he leaves a barracks building, a rocket comes through the roof moments later with devastating results. One night, after he has a premonition to get out of the shack he is in, and just after he does, a driverless M48 runs over it. He knows his luck has run out.

For his action at Tan Son Nhut, Birdwell is a potential candidate for the Congressional Medal of Honor or the Distinguished Service Cross, but receives a Silver Star instead, and he hears later that two disgruntled crew members interfered with the write-up for his award. Birdwell receives a second Silver Star for his combat action at An Duc. He has been promoted to Spec 5 and tank commander, but in spite of all his success as a soldier, Birdwell never gets converted to sergeant or makes E-6.

This book is well-written by Birdwell and Nolan, and I liked what it had to say. It offers a firsthand account of armor combat in Vietnam with continuity and coherence, which allows the reader to see the change in operations and troop morale before and after Tet. It kept me engaged, and even with taking notes for this review, it was a three-night read. The book has an appendix with a listing of troopers who are KIA or who later died of wounds, and a glossary. There are also black and white photos.

PAUL S. MEYER
Former USAARMS Information Officer
and Armor School Historian
Cincinnati, Ohio

Nine Battles to Stanley by Nicholas van der Bijl, Pen and Sword Books, 1999, 208 pages plus 16 pages of photographs, glossary, appendices, and 18 maps), $36.95 online, IBSN: 0850526191.

This is a book about the land battles conducted during British recapture of the Falkland Islands in 1982. The author was 3 Commando Brigade's military intelligence officer for the campaign.

The first five chapters set the stage for the nine battles. The author starts with a good description of the politics and actions that lead up to the Argentine invasion of the Malvinas (their name for the Falkland Islands) and then describes the invasion itself. He then provides a good description of the forces that will fight the battles. In Chapter 4, he tells of the recapture of the outlying South Georgia Island by the Special Air Service (SAS), Special Boat Service (SBS) and the Royal Marines. He then describes how SAS and SBS elements conducted advance forces operations before the main British landings.

The next six chapters are the meat of the book and describe the ground fight to recapture the Falklands. It walks the reader through the amphibious landings at San Carlos, the advance and capture of Goose Green, the advance and capture of the outer and inner defenses of Stanley and culminates in the final battle for Stanley itself and the surrender. Eighteen maps, which are scattered throughout the book, are well designed and allow the reader to visualize the ground during the various portions of the campaign.

The author offers an honest look at the campaign and discusses the bad as well as the good. During Special Forces' operations, there were planning and other problems that resulted in unnecessary loss of life. In the author's opinion, this was at least partly caused by the elitism of the SAS. During the capture of Goose Green by the 2nd Parachute Battalion, he describes leadership and impatience problems that may have been a partial cause for the death of the commanding officer. He also keeps reminding the reader of the effects caused by a lack of military intelligence personnel.

Bottom line: A well-written and interesting book that is worth reading. I was fortunate enough to have read a number of the British after-action reports soon after the Falkland Islands were recaptured. The events and concerns described in them seem to match what is in the book, so I think it is generally accurate. However, I offer one warning to the reader. In Chapter Three, Mr. van der Bijl makes a glaring error (at least to an armor officer) by mixing up the main armaments of the Scorpion AFV and the Scimitar AFV. This would seem to indicate that either there was a lapse in proofreading or he got his facts wrong. It left me with some doubt as to the accuracy of some of his other details.

MAJOR G.R. HALL
Director Army Training 3-2 (Armour)
Kingston, Ontario, Canada

Agincourt by Christopher Hibbert, Cooper Square Press, June 2000, maps and illustrations, 176 pages, $16.95.

This story shall the good man teach
his son;
And Crispin Crispian shall ne'er go by,
From this day to the ending of the world,
But we in it shall be remembered.

-King Henry V, IV, iii.

Nine thousand men and a young monarch sailed from the port of Solent, England, on August 11, 1415; three days later they began an invasion of France. This invasion would lead to the greatest battle of the Hundred Years War and an epic moment in English history — the battle of Agincourt.

Historian Christopher Hibbert, author of *Agincourt,* has created a splendid and readable account of the historic battle. Hibbert details the events which led to the invasion, explores the strategies invoked by the two armies, and examines the armor and armament of the different classes of fighters involved in the struggle.

What sets Hibbert's account apart from previously published accounts? Quite simply, the book is much more than an account of tactics employed during the battle; it is a great read. Readers will find a wealth of information tucked inside a compelling tale. Ten chapters describe Henry V's actions prior to Harfleur, the siege and fall of Harfleur, the march to Calais, the battle of Agincourt, and the young king's triumphant homecoming.

Hibbert's prologue reviews Henry V's (HV) justification for launching the invasion and provides insight into the effort and expense expended to secure an "army by contract." The author also outlines the army's organization and describes the various classes of fighters and their weapons in the book's prologue.

The inclusion of Harfleur and the march to Calais were welcome additions. Many texts give short shrift to these events, focusing more on the final battle. Hibbert's detailed accounts of both armies and how they come to arrive at Agincourt gave me a new appreciation for the fight. The author documents HV's determination to enforce discipline in his army, a determination that results not so much from a wish to protect the French from looting, etc., but rather from a need to unify an army which is essentially a mix of armies and forces. This strict discipline is made famous in Shakespeare's play *Henry V,* when the young monarch hangs a co-conspirator from his rebellious youth for looting.

Hibbert explains the forces which motivate HV to ignore the advice of his staff and march his ever-shrinking force (now 6,000 more or less fit men — less than 1,000 men-at-arms and scarcely more than 5,000 archers) to Calais. The depleted English force departs Harfleur with eight day's worth of rations and begins a cat-and-mouse chase with the formidable French force (approximately 60,000) on the northern bank of the Somme. Eventually, the English cross the Somme, but the French force moves to block the road to Calais and force the battle.

Hibbert sets the stage for the battle well, guiding readers through both camps and vividly describing the condition and mood of the combatants. He does a fine job of dissecting the three-hour fray in a blow-by-blow fashion, weaving analysis throughout and describing the terrain in detail, noting its significance in this particular battle. The author also sheds light on Henry V's butchering of French prisoners, an event that has been variously interpreted over the years.

In summary, this is a well-written account and a must for those interested in gaining a better understanding of this great battle and the events and armies that shaped it. I found the author's illustrations helpful, especially the map of the battlefield and its depiction of how the forces were arrayed. I enjoyed the passages taken from Shakespeare's *Henry V,* but found the French passages minus translations distracting. (I cursed myself for my failure to recall more of my high school French).

MAJ DAVE DAIGLE
ARMOR Staff

Guide to Military Operations Other Than War: Tactics, Techniques & Procedures for Stability & Support Operations: Domestic & International by LTC Keith E. Bonn, USA (Ret.) and MSG Anthony E. Baker, USAR (Ret.), Stackpole Books, Mechanicsburg, Pa., 2000, 448 pages, $19.95, paperback.

Keith E. Bonn and Anthony E. Baker are both retired Army soldiers who have created a book with the intent of helping prepare military professionals and civilian agencies for the complex and often highly politicized Military Operations Other Than War (MOOTW). Both authors have served in a variety of positions and locations that give them excellent qualifications to write a book about this complicated topic.

The book begins with an overview of MOOTW and its characteristics. Right from the beginning, it is obvious that this book is written like a textbook. If you were teaching a course on MOOTW, this would be an ideal text. The parts and chapters follow a very logical pattern and lead from the general and theoretical to the practical and specific.

The textbook nature of this book is both its strength and weakness. I received this book to review in January and began to read it immediately. By July, I was skimming through the chapters. It is *that* dry. While the information contained is useful and very informative, it is not very engaging. I read this while in the safety of Fort Irwin, Calif., with no expectation of deploying to a MOOTW anytime soon.

Therefore, there was no personal urgency. If I were to foresee a deployment to a security and stability operation on the horizon, this book would be of use and I expect would take on a greater interest.

The best and most interesting parts of the book were in Part III: Tactics, Techniques, and Procedures (TTPs) for MOOTW. This section describes tasks, conditions, and standards for training a force in developing MOOTW skills, describing, for example, techniques of searching a building, reacting to a civil disturbance, or conducting a show of force. Numerous aids accompany the text, for example a diagram of a prisoner exchange point and a convoy operations order.

The other useful section, and in a day-to-day environment of professional reading the most useful, was Part IV: An Encyclopedia of Prominent NGOs and Federal Agencies Involved in MOOTW and the Acronym and Glossary Appendices. These provide some of the most comprehensive lists of acronyms and the most succinct and concise discussion of different agencies and their role in MOOTW.

The information presented in this book has importance to both civilian scholars and military professionals. I think it would be of use in preparation for a MOOTW deployment, but is not designed as "light reading." I only recommend this book to dedicated professionals who read for information's sake. The higher level, the more useful it will be. The average platoon leader would probably not be spending his time well to read this, but a brigade plans officer or a member of a division staff will probably find the information and TTPs invaluable.

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Software

Panzer General III: Scorched Earth by Mattel Interactive (developed by SSI), est. $29.95.

Extra information at www.ssionline.com or www.panzergeneral3.com.

Requires Windows 95/98, 266 MHz Pentium II or faster, 32 MB of RAM minimum, 4X CD-ROM, 3D card recommended. Supports internet, modem, and LAN play.

Reviewed on IBM PC with Pentium Celeron 300A, Windows 98, 64 MB RAM, and 16 MB 3D graphics card.

Panzer General III: Scorched Earth is the fourth release in the venerable Panzer General series, sporting the new 3-D engine first introduced in the Western Front-based *Panzer General II: Assault. Panzer General III* is a heavily abstracted, turn-based simulation of operational combat on the Eastern Front. Like its predecessors, it uses an I-go, You-go turn format built around a straightforward interface and simple game mechanics. Despite this simplicity in design, combined arms and effective maneuver are integral to successful game play. Victory is determined by how efficiently the missions are completed, with time taken, kill ratios, and victory locations being important factors.

Coverage is broad, with several famous confrontations, such as the Korsun Pocket and Operation Barbarossa's assault on Smolensk, included amongst the 24 standalone scenarios — oddly, Stalingrad and Kursk are not included. The game also contains four campaigns, each loosely linked to a prominent general of the Eastern Front (Zhukov or Konev for the Soviet Union, Manstein or Guderian for Germany). Picking one of these four generals determines the direction and difficulty rating of the campaign, but the scenarios played are only thematically related to a particular general's history.

To its credit, *Panzer General III* manages to capture the feel of a war game considerably more accurate in scope. All the familiar historical units are included, each presented in the correct historical context. As the war goes on, new units become available. Early on in campaigns, the Soviet Union is limited by obsolete equipment and poor leadership, reflecting the Stalinist purges. As the war goes on, the boot is shifted to the other foot, with the Germans outnumbered and outgunned. Units, such as tanks, bombers, infantry and artillery, are rated according to a range of attributes — anti-personnel strength, anti-armor strength, defensive-strength, range and movement, for example. The ratings are abstracted, approximating relative effectiveness, and similar license is taken with the ideas of scale and time. Units are not sized historically. There are no armored divisions, for example, just tank units that embody an amount of combat power. In the same vein, hexes and turns are arbitrary in size and length, as are the maps themselves.

To ease newcomers into the game, a tutorial comprised of four short scenarios is included that explains how to assemble and deploy a force, the rudiments of movement and fire, and notions of supply and morale. While statistical accuracy might be lacking, much effort has been put into getting the feel of the tactical game right: infantry are most effective in closed terrain (cities, towns and woods), where they can close with opposing units; artillery will suppress enemy forces prior to a ground attack; careful use of reconnaissance will not only prevent friendly forces from being ambushed, but will also reveal optimum avenues of approach to the objective.

Perhaps the most refreshing element of *Panzer General III* is the focus on leaders and leadership. Every unit is assigned a leader, with the leader rated for his promotion level (experience) and his class (tank leader, infantry leader and so on). Leaders determine the number of actions available to their units, and also provide units with a range of action types, such as dig-in, resupply, and refit. As a leader's promotion level rises, he gains access to veteran orders that are unique to his class — an armor unit led by a veteran armor leader can adopt a hull-down position to increase its defensive value; a veteran air leader can call on his bombers to bunker-bust their way through enemy positions — and also has a chance to receive special or enhanced units. Leaders can also develop special talents as they gain experience. The consequence of all this is that careful use of one's leaders is an important path to victory. Few other war games have given the brass such status.

Visually, *Panzer General III* is quite stunning (with 3-D terrain depiction and dynamic weather). Honestly, I tend to prefer war games where graphics are simple enough to represent the game succinctly but without fuss. Fortunately, while it is fetching, the 3-D landscape isn't so garish as to distract from analysis and planning.

Minor flaws in the game are the rather rudimentary supply model and a tendency for the maps to be too large for the given number of units employed. But these can be overlooked, given the intended audience. Not so easy to dismiss is the poor quality of the AI opponent. Although the multi-player facility makes playing against a human possible, I still find that most of my games are versus the computer. Unfortunately, the AI provided a passable challenge at best, its attacks tending towards the piecemeal and its defense predictable.

Nevertheless, *Panzer General III* is perfectly suitable as a quick diversion for experienced wargamers, and a challenge for those newer to the genre. It achieves exactly what it sets out to: providing a simple, easy, enjoyable introduction to computer wargaming. The focus on leadership is a welcome change, and the intuitive interface and authentic feel will provide novices with a rich sense of atmosphere and history. In addition, careful design ensures that, to win, beginners need to learn the importance of combined arms and maneuver, valuable lessons if they are to graduate to more accurate and challenging arenas.

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2001 Armor Conference and Armor Trainer Update

19 – 24 May 2001

"The Armor/Mechanized Legacy Force:
Dominating Maneuver Warfare Through 2015"

DATE	TIME	EVENT	HOST/SPEAKER	LOCATION
Saturday	0900-1600	Contractor Displays Setup	DFD	Skidgel Hall
19 May	1500-1900	Registration for ATU/Armor Conference	DAS	Gaffey Hall
Sunday	0700-0930	Registration for ATU/Armor Conference	DAS	Gaffey Hall
20 May	0900-1500	Contractor Displays Setup/Registration	DFD	Skidgel Hall
	0900-1700	ATU/Welcome Presentations	SACG	Haszard Auditorium
	1900-2200	No-Host Social for ATU (Induction of ARNG colors - TBD)	SACG	Leaders Club
Monday	0700-1600	Registration	DAS	Leaders Club
21 May	0800-UTC	External Unit Scheduling Conference	G3/DPTM	Armor Inn
	0800-1200	Master Gunner Forum	Chief, MG	Richardson Hall
	0830-1645	USAARMC Sergeant Major Update	CSM	Leaders Club
	0900-1600	ATU TASS Battalion Updates	DAS/TID	Haszard Auditorium
	0900-1630	Brigade and Regimental Commanders Meeting	OCOA	HQ Conf Room
	0900-1700	Subject Matter Expert Briefings	Varied *	
	0900-1700	Contractor Displays	DFD	Skidgel Hall
	1030-1400	Honorary Colonels of the Regiment	OCOA	Rivers Auditorium
	1800-UTC	Pre-Golf Classic/Skeet Shoot Social	DCFA	Gallota's
Tuesday	0700-1600	Registration	DAS	Leaders Club
22 May	0800-1200	Master Gunner Forum	Chief, MG	Richardson Hall
	0830-1400	6th Annual Golf Classic (0830-Lindsey/0915-Anderson)	DCFA	Golf Courses
	0900-1700	Subject Matter Expert Briefings	Varied *	
	0900-1700	Contractor Displays	DFD	Skidgel Hall
	1030-1600	2nd Annual Skeet Shoot (weapons available at range)	DCFA/G-3	French Range
	1630-1830	CG's Garden Party	MG Bell	Quarters One
	1900-2100	Regimental Buffet and Assemblies - Induction of 14th Cav colors	OCOA	Leaders Cub
Wednesday	0700-1200	Late Registration	DAS	Gaffey Hall
23 May	0800-1700	Contractor Displays (0800-1000 dedicated period for Sr. Leaders/VIPs to view displays)	DFD	Skidgel Hall
	0915-0945	Armor Association Meeting	Armor Association	Haszard Auditorium
	1000-1055	Chief of Armor Update	MG Bell	Haszard Auditorium
	1105-1200	CENTCOM Warfighting Requirements	LTG DeLong	Haszard Auditorium
	1215-1315	Lunch		Leaders Club
	1330-1345	Presentation of 7th Annual Franks Award	GEN Abrams/MG Bell	Haszard Auditorium
	1345-1440	Institutional Transformation	GEN Abrams	Haszard Auditorium
	1450-1545	Digitized Div/DCX Update	MG Griffin	Haszard Auditorium
	1600-1730	Cavalry Transformation and Modernization	COL Nunn/COL Hughes/ COL Weaver	Haszard Auditorium
	1815-1845	Armor Leader Dedication (Unveiling of MG Peled portrait)	Mr. Purdy	Patton Museum
	1830-1930	Cocktails	Armor Association	Armor Inn
	1930-UTC	Armor Association Banquet	GEN (R) Saint	Armor Inn
Thursday	0830-0925	USAREUR Update	TBA	Haszard Auditorium
24 May	0900-1300	Contractor Displays	DFD	Skidgel Hall
	0935-1030	FORSCOM Update	GEN Hendrix	Haszard Auditorium
	1045-1145	Army Transformation	GEN Shinseki	Haszard Auditorium
	1200-1330	Chief of Armor Luncheon	GEN(R) McCaffrey	Leaders Club
	1330-1345	Closing Remarks	MG Bell	Leaders Club
	1345-1400	Impact Awards	MG Bell	Leaders Club

* An expanded schedule will be available at registration or you can get up-to-date information at the Armor Conference website: *www.knox.army.mil/arconf*

2001 Armor Conference:

The Armor/Mechanized Legacy Force: Dominating Maneuver Warfare Through 2015

The Armor Center and Fort Knox are gearing up for the 2001 Armor Conference, scheduled for 19-24 May. As in the past, the Armor Trainer Update and the Armor Conference will present an opportunity for professional development and discussion on a wide variety of topics, as well as many social events. The conference theme, "The Armored/Mechanized Legacy Force: Dominating Maneuver Warfare Through 2015," reflects the Chief of Armor's intent to present a broad review of the Armor community's contributions to and participation in Army Transformation along all three Transformation axes to the Objective Force: the Initial/Interim Force; the science and technology/research and development effort to the Future Combat System; and the recapitalization/upgrade and positioning of the legacy mechanized force. The focus of this conference is the path upon which we bring these three efforts together into a powerful, full-spectrum Objective Force.

Once again, MG Bell has invited Army leaders who are at the forefront of Army Transformation to offer presentations on the plans and expectations for the force. From the requirement to recapitalize, upgrade, and position the current mechanized legacy force to our efforts, under the leadership of TRADOC, to redefine expectations of and approaches to leadership development within the Armor Force — particularly emerging institutional approaches.

The Armor Trainer Update will again precede the Armor Conference on May 20th and 21st and will be focused on the Army Reserve and Army National Guard components. Presentations will include discussions on these component's integration with their active component counterparts, ARNG transformation, and an update on their continued increasing role in meeting the Armor Force's mission requirements.

On May 21st, as the ATU continues, G3/Directorate of Training, Plans, and Mobilization will hold the Annual External Unit Scheduling Conference. This conference is currently scheduled to be held at the Armor Inn and allows Reserve, National Guard, Active Component, and units from other branches to schedule Fort Knox facilities for training. The Armor Center facilities are some of the best the Army has to offer, and this conference affords an opportunity for units to schedule them for training.

Subject matter expert briefings are scheduled for the May 21st and 22nd, in various locations, and are intended to present more detailed updates, overviews, and discussions on the many aspects of Army Transformation.

On the lighter side are the 6th Annual Golf Classic, the 2nd Annual Skeet Shoot, social events held every evening, and the Chief of Armor Luncheon held the final day of the conference. Weapons for the Skeet Shoot will be available at the range.

Many companies will be present with displays of the defense industry's newest military equipment. These displays are always among the most popular attractions.

In continued recognition of contributions made to the Armor Force, MG Bell will present the seventh annual General Frederick M. Franks Jr. Award to an individual who has made a demonstrated long-time contribution to the groundfighting and warfighting capabilities of the Army. Last year, CSM Henry M. Vance III received the award for his numerous contributions to the mechanized force and development of Army leaders and soldiers over a 28-year period. Award nominations are open to any mounted active duty or reserve officer, noncommissioned officer, or Department of the Army civilian. In keeping with this year's theme, heavy consideration will be given to the nominee's contributions towards the recapitalization/upgrade, and leadership required for positioning the Legacy Mechanized Force. Additionally, nominees should possess two or more of the following characteristics of duty performance during the year or years preceding the award: offered a vision for the future of the mounted warfighting force that significantly improved combat survivability, lethality, maneuverability, or mobility; developed an innovation in equipment, material, or doctrine that significantly enhanced the effectiveness of mounted elements of the combat arms; exemplified professional excellence in demeanor, correspondence, and leadership on issues relevant to mounted warfare; displayed a love of soldiering through skills, recognition of the sacrifice and achievements of subordinates; and attention to the intent and directions of higher commanders. In keeping with the example demonstrated by the award's namesake, any soldier in the Army can recommend another soldier or civilian for the award. For more details, visit the Fort Knox web site at *www.knox.army.mil/arconf*.

The Armor Conference is a great opportunity for the Armor community to gather and highlight the greatest mounted combat force ever. These events attract a wide audience annually and this year will be no exception. We hope to welcome you all to Fort Knox.

Event	POC	DSN Number	Commercial
Armor Conference	SFC Douglas Kennedy	464-7364	(502) 624-7364
Armor Trainer Update	COL Randal Milling	464-1315	(502) 624-1315
CSM Update	SGM Gary Lawrence	464-1321	(502) 624-1321
External Scheduling Conference	William Rosacker	464-3555	(502) 624-3555
Contractor Displays	Kim Thompson	464-2708	(502) 624-2708
USAARMC Protocol	Jack Eubanks	464-6615	(502) 624-6615
USAARMC Protocol	Sherry Cart	464-6103	(502) 624-6103
Armor Association	Connie Stiggers	N/A	(502) 942-8624
VIP Billeting	Reservations	464-6180	(502) 624-6180
On-post Housing*	Carolyn Burton	464-3491	(502) 943-1000
Armor Conference Skeet Shoot	Skeet Range Manager	464-2314/7754	(502) 624-2314/7754
Armor Classic Golf Scramble	Golf Manager	464-4218	(502) 624-4218

* Reservations will be accepted up to 60 days prior to conference start date

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