ARMOR

HARMON

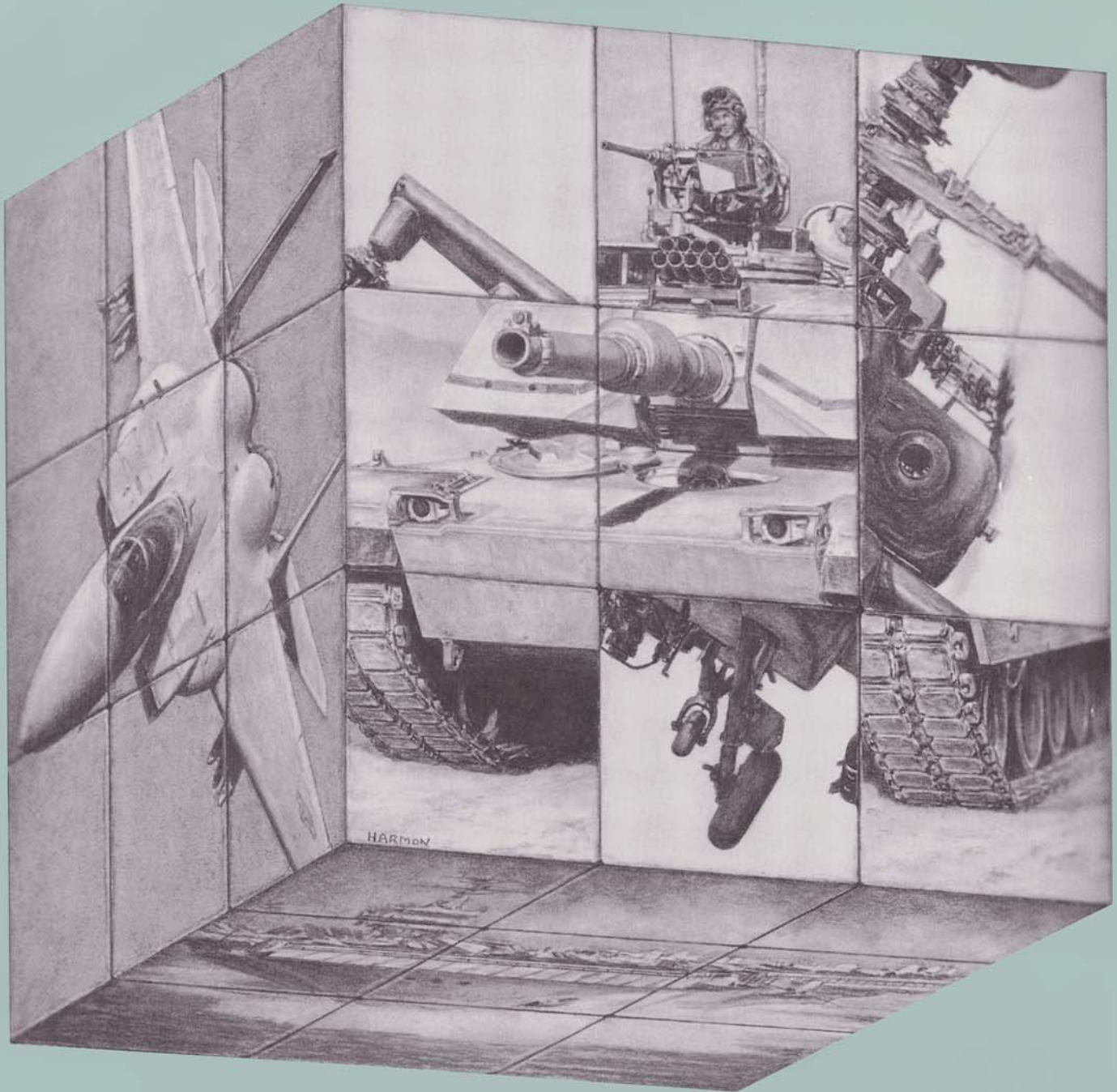## Airpower and Tanks in 2010 See Page 8

Stand To

When we published then-SSG Stephen Krivitsky's brilliant device, this quick-estimating fuel gauge for the M1 tank, we had no idea it would be so popular and so widely reproduced. But that was then, and given normal turnover and the effects of the draw-down, there are probably plenty of platoon sergeants and platoon leaders who have never used this neat idea.

In all operations conducted by M1A1 forces, to include Operations Other Than War (OOTW), logistical reporting must be clear, concise, and accurate. These reports, when tabulated correctly, may save hours wasted in unnecessary resupply or missent fuelers. To aid the tank commander, platoon sergeant, and platoon leader, each vehicle commander can use this simple chart, which allows the tank crew to quickly compute an accurate Class III report.

The tank commander requests fuel status from the driver, who reads fuel levels from his instrument panel in this order: Right Front first, followed by Left Front and finally the Rear tank.

The driver states each tank's level: "Right Front.... 1/2 .... Left Front .... 3/4 ... Rear ....1/2"

The tank commander, following the driver's response, moves down the "RIGHT" column to 1/2. While staying in that block, he moves to the 3/4 mark for the "LEFT" Column. Once there, he moves his finger right to the "REAR" columns where he continues to go to the right until he reaches the 1/2 section.

The fuel remaining is **277** gallons.

RIGHT FRONT	LEFT	REAR E	1/4	1/2	3/4	F
E	EMPTY	0	62	124	186	248
	1/4	26	88	150	212	274
	1/2	52	114	176	238	300
	3/4	78	140	202	264	326
	FULL	107	169	231	293	355
1/4	EMPTY	38	100	162	224	286
	1/4	64	126	188	250	312
	1/2	90	152	214	276	338
	3/4	116	178	240	302	364
	FULL	145	207	269	331	393
1/2	EMPTY	75	137	199	261	323
	1/4	101	163	225	287	349
	1/2	127	189	251	313	375
	3/4	153	215	277	339	401
	FULL	182	244	306	368	430
3/4	EMPTY	112	174	236	298	360
	1/4	138	200	262	324	386
	1/2	164	226	288	350	412
	3/4	190	252	314	376	438
	FULL	219	281	343	405	467
FULL	EMPTY	150	212	274	336	398
	1/4	176	238	300	362	424
	1/2	202	264	326	388	450
	3/4	228	290	352	414	476
	FULL	257	319	381	443	505

GREEN	401-505	RED	201-300
AMBER	301-400	BLACK	0-200

(IAW FM 101-5-1)

ARMOR

The Professional Development Bulletin of the Armor Branch PB-17-98-5

Features

Departments

ON THE COVER:

Helicopters can supplement, augment, and support tanks, but they cannot re-place them. See article on Page 8.

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to a format we can use, the shading gets lost or distorted.) If you have any questions concerning electronic art submissions, call Vivian Oertle at the phone number above.

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LETTERS

At the Mutla Ridge:
The Rest of the Story

Dear Sir:

Periodical distribution to Europe being a bit slow, I have just received the May-June issue of *ARMOR*. A quick comment on LTC John Antal's article, "It's Not the Speed of the Computer That Counts!"

I had hoped John would capture at the end of his piece the anecdotal "so what" of the opening paragraph's lead-in on the Tiger Brigade's oral frag orders episode preceding the attack of the Mutla Ridge on the 26/27 of April 1991, but he didn't, so I will try here to give just a little Paul Harvey(ish) "the rest of the story."

The plan did, indeed, change a number of times as the 2nd Marine Division and the MEF received late and conflicting information on the Iraqi scramble to "get outta Dodge" with all their pillage and loot. Information was also slow, and required various layers of checking on the movements and intentions of the Syrian, Eygptian, Saudi, and Kuwaiti forces allied into Joint Force Coalition North to the Brigade's west. This meant that all commanders in the Tiger Battle Team needed to be as situationally aware as possible on that very smoke-, dust-, and information-obscured battlefield. This necessitated detailed knowledge of the original plan, which included numerous branches and sequels, all of which had been thoroughly rehearsed at every level. They also needed to be well schooled in the SOP battle drills of the brigade, and each of the battalions. These had, of course, been trained and trained in all weather, day and night... repeatedly! Thus, situational awareness based on good battalion and brigade radio and physical crosstalk, net "eavesdropping" SOPs, and timely oral orders combined with simple, standardized battle drills and allowed that particular dynamic battlefield to be a successful one, where fratricide did not occur, and the mission, albeit a multiply changed one, was accomplished!

You might also note that COL (then MAJ) Bobby Williams was the superb S3 of the "Hounds of Hell" (3-67 AR), not the Tiger Brigade. COL (then MAJ) Mike Obermeyer was the guy who "kept me straight" as "Tiger 3"!

J.B. SYLVESTER
MG (then COL), USA
(then) "Tiger 6"!

Single Best Solution May Be
The Enemy of the Good

Dear Sir:

In reference to the article, "It's Not the Speed of the Computer That Counts," by LTC John Antal, which appeared in the May-June issue: First, I wish to commend LTC Antal for his very interesting and instructive article on a very important subject — deci-

sion-making by a commander. Second, I agree that there are two ways for a commander and staff to employ decision-making. There is analytical decision-making, where the commander's staff plays the dominant role, and the staff follows a systematic, step-by-step approach to determine a *single best solution*. It is the concept of a *single best solution* that I disagree with. I would substitute "choosing a *good* solution, rather than single *best* solution." Searching for the *single best solution* implies that there is such an ideal solution to a situation of so many variables that it would defy geniuses. Since it is rare to find staff officers of genius quality, it is more practical and humanly possible to recommend to the commander *a good solution*, rather than the arrogant and pompous *single best solution.* Prussian staffs and commanders should always keep in mind an important principle of operations in the field, the principle of simplicity, wherein "direct, simple plans and clear, concise orders reduce misunderstanding and confusion. Other factors being equal, the simplest plan is preferred." (From 5-11, Principle of Simplicity, *FM 100-5, Operations,* Sept. 1968.)

(The alternative is) *recognitional* decision-making, wherein the commander plays the major role in decision-making while his staff focuses its efforts on implementing his decision, rather than searching for a *single best solution.* The commander uses his knowledge of the combat situation, and the latest reports on the enemy, terrain, and friendly forces, to rapidly decide on one specific (I prefer to state it as "*one good solution*") course of action.

I also believe it would be more appropriate (and less confusing) to call this "Recognition Decision-Making" by its original name, "The Commander's Estimate of the Situation," and not by this high-falutin' name of "Recognitional Decision-Making." Here again, the application of the principle of simplicity should encourage us to use the simplest terms in our lexicon of military terms.

The commander's estimate of the situation and the troop leading procedures have been outlined in various manuals and convenient pocket-sized cards. One which I still carry around is entitled, "Small Unit Leader's Card: Troop Leading Steps," printed as GTA 21-2-5, 15 December 1967.... It was an attempt to instill a systematized, logical way to think when arriving at rapid decision-making in COMBAT; and also served as a checklist when issuing a complete combat order, as well as a checklist for troop leading steps. I should add that such aids for combat leaders served well for assistant squad leaders on up the ranks to regimental (brigade) commanders in WWII, Korea, and Vietnam.

In essence, I agree wholeheartedly with his statement that "It's not the speed of the computer that counts," but rather the lightning speed of the human brain to attain "rapid battlefield decision-making." Indeed, I learned the Commander's Estimate of the Situation as a plebe at West Point, and it served me well as a commander and staff officer in the Korean and Vietnam Wars. I

practiced using the Estimate of the Situation over 30 years, so that as a brigade commander in Vietnam, I could make an estimate in a matter of seconds and, indeed, I made such estimates almost automatically. This, I believe, was the single most important thing that permitted me and my command to attain success in combat.

I wish to thank LTC Antal for his highly professional article on a very, very important subject.

DUQUESNE A. WOLF
COL, Retired
Niceville, Fla.

The Challenge of Protecting
Light Armored Vehicles

Dear Sir:

Back in 1972, under the leadership of Col. Charlie Lehner and Dr. Chuck Church of DARPA, a few of us, including Dick Ogorkiewicz, considered the future for armored vehicles in the post-1995 time frame. In 1974, we considered what would be needed to face the various threats of 1995 and beyond. Believe it or not, even back then one could see from the literature that the primary threat to rapidly deployed airmobile light vehicles was the precision-strike munition.

My series of articles on tanks, armor, and armor penetrators (to include mines) in the early 1980s included many things that still should be considered for a baseline before going off to "revolutionize" the battlefield with "new concepts." In brief, look back to these, to the books by Richard Simpkin, the many articles by Dick Ogorkiewicz, and others before reinventing either the threat, the scenario, or the "new concept." For example, at the end of the series on mines, you will find the mention of anti-helicopter mines. If you search back through books and articles, you will find that the U.K., Germany, and some in the U.S. Army War College were thinking "Vietnam-like" thoughts about "new revolutionary mobile warfare" based on armed, armored helicopters in the early 1980s. (Believe it or not, these people had missed an article in *ARMOR* Magazine, "HIND, A Legacy from Lenin," (January-February 1979, pp. 10-12), which used "the numbers" to show that the HIND was already basically an airborne BMP!) However, the show-stopper was a simple question with which I interrupted General von Senger und Etterlin: "Sir, have you considered anti-helicopter mines." They had not. Everyone now also knows the story of HINDs in Afghanistan... and how they were brought down by Stingers.

We considered many things to make a light armored vehicle for the scenarios that you are now wrestling with in *ARMOR*. One of the things that I mentioned in my article of May-June 1983 is that spaced armors need not always have all their components installed at all times. This can keep the enemy guessing both before and during a conflict, creating the essential element of doubt. (I

would also like to add that, as early as 1980 for Ford Aerospace, we demonstrated missile warheads having capabilites far beyond those which have made it through the R&D cycles around the world. In fact, many of today's anti-armor warheads use some of the things that we created and tested. [Don Kennedy (another old *ARMOR* Magazine contributor) and I did create the warhead section and lethality methodology for Rockwell's 1976 proposal for development of Hellfire. Not all our design niceties have ever yet been used.])

The bottom line is that we can make weapons that can turn anything inside out, and there are more than a few people like us around the world. Thus, you cannot make any armored vehicle invulnerable... you can only have local invulnerability based on the scenario. This, in turn, is the key to light, airmobile, ground-mobile armored vehicles — only insert the armor needed to accomplish the mission. And if that means that you need heavy armor, then insert it after you establish the "beachhead" through massive firepower and speed of arrival. (By the way, if you really think about it, we had to wait until we rolled up the appropriate armor and weapons before starting Desert Storm. Same principle, different time scale.) I am speaking about having spaced armor arrays into which one can place additional armor panels when needed to perform the mission. Obviously, the armored vehicle would be lighter without these panels..... resulting in it being more airmobile... but, the enemy would not especially know whether the panels were in there or not. If heavy armor — i.e. the additional panels are needed, then these panels can be flown in later and inserted in the first vehicles when they rearm... or into the vehicles of the second, third, etc. wave when they land... if the scenario permits.

The other problem that one faces is the "long smoke pole." As much as I like big guns...a much different suite is needed for light mobile armored vehicles. Such options were mentioned in the May-June 1983 issue. However, basically two weapons are needed, a primary weapon for killing people, and a secondary weapon for killing everything (and I mean everything) else.

With today's technology, the primary weapon should be an automatic gun/mortar of 80 to 100-mm caliber. (May sound familiar.) Munitions technologies can easily make this capable of carrying out all antipersonnel activities, even to include the use of nonlethal munitions. Munitions can also be included for both direct and indirect fire kill of buildings and enemy materiel, to include other light armored vehicles.

The secondary weapon system, as also mentioned in 1983, should be a bank or two of vertically launched missiles capable of using their warheads to stop precision-strike munitions, recon aircraft, armed armored gunships, and [by plunging fire] heavily armored tanks. The arrangement might be similar to that in current naval vessels in the form of a single bank in the rear or possibly as rows along the sides of the vehicle. With today's computer technologies and rocket propulsion from ballistic missile interceptors, all the rounds should be "at the ready" — one might need to simultaneously launch all of them to stop three ATGMS, a laser guided projectile, and that pesky "fly-in-the-sky" — and who is the person who really cares how many they shoot so long as they live and finish the mission?

Finally, some references to seek out:

Richard Simpkin, *Race to the Swift: Thoughts on Twenty-First Century Warfare,* Brassey's Defence Publishers, Oxford, England, 1985, ISBN 0-08-031170-9.

Richard E. Simpkin, *Antitank: An Air-mechanized Response to Armored Threats in the 90s,* Brassey's Defence Publishers, Oxford, England, 1982, ISBN 0-08-027036-0.

Richard Simpkin, "Flying Tanks? - a tactical-technical analysis of the 'main battle air vehicle' concept," *Military Technology,* MILTECH 8/84, pp. 62-80.

JOE BACKOFEN
via email

"Keep *ARMOR* Coming In Readable, Paper Form"

Dear Sir:

I'm a civilian who has never been in the service. My lack of real-world military experience does nothing to lessen my excitement each time I see that paper cover arrive in the mail. I have just received the latest issue of *ARMOR* and want to comment on "Stand To." Hooray for you!

I have been an avid reader of *ARMOR* for several years. *ARMOR* was a great source of reference for me when I inked my first novel: *Reasonable Sufficiency.* I say hooray for you and your commitment to keep *ARMOR* coming in readable, paper form.

I work in the data processing industry for the world's largest producer of dry pet food here in St. Louis, and I am very close to the dealings of electronic media vs. paper. As a techno-nerd, I am aware of the benefits of computers, and their pitfalls. As a writer and researcher, I know the value of paper as a media. Most of our vendors no longer supply manuals. Everything comes on CD, and it just isn't the same.

"They had a good idea then. And it may still be." I reiterate your words and add: They had a GREAT idea then, and it is still the best, most helpful way to produce *ARMOR* magazine. Keep up the great work!

DAVE GLUECK
Via email

Let's Keep a Product We Can Touch, Read, and Pass On

Dear Sir:

I have never written to a publication but I feel compelled to stand with you in support of tradition and practicality in the information age. *ARMOR* is one of the most valued written products I receive. I anxiously await each new issue, and along with my comrades discuss latest trends and developments in our profession. I am a National Guard Tanker, 5-112th Armor to be exact, and our publication keeps us all tethered together — active component and reserve component. It fills in our education, when funding or circumstances do not allow formal schooling. Lately, the 3d Bde, 49AD went through the excellent Warfighter training program, which exercised the military decision-making process. This taught us the basics, but imagine my pleasure to pick up *ARMOR* this month and learn about an abbreviated process to enhance what we already learned (thank you, LTC Antal!). Sir, this is only possible through this written product. The Internet is great, but let's keep a product that we can touch, feel, read, and read again. In 20 years, I want to be able to pass along this product to young tankers and cavalrymen, as it has been passed to us.

TERRY WHITLEY
CPT, Armor, TXARNG

We Have a Better System Than Tanks For the Indirect Fire Role

Dear Sir:

This letter is in response to Mr. Loughlin's letter in the May-June 1998 issue, commenting on my letter in the November-December 1997 issue, regarding TERM munitions.

Evidently, Mr. Loughlin completely missed my point. I did not challenge the technical advances or capabilities of artillery-like guided projectiles to successfully attack and destroy tanks and other armored vehicles. What I challenged is the supposed need of turning the main battle tank (MBT) into an indirect fire artillery piece when more suitable systems are already available.

If technology reaches the point where armored self-propelled (SP) mortar carriers, artillery, and missile launchers can destroy enemy tanks long before the latter reach direct fire range, then we will need fewer MBTs and should have more of these SP indirect firing systems instead. This is completely different from the proposed TERM concept of giving tanks a dual-role capability.

Regarding Mr. Loughlin's comment, "the military likes to believe that tactics and strategy drive technology," I have no clue how he developed such an opinion. Tactics and strategy have always had to adjust to new technology (though there is often a lag time during which a lot of troops get slaughtered until the leaders figure out the new rules). Regardless, the solution has almost always been found in closer coordination of combined arms. Attempts to have one system "do it all" or "go it alone" have invariably failed.

COMMANDER'S HATCH

A Progress Report on OPMS XXI

by MG George H. Harmeyer, Commanding General, U.S. Army Armor Center

OPMS XXI implementation is moving along as planned. Just this past May, the Chief of Staff of the Army agreed to a recommendation from the OPMS XXI implementation team to move from Phase I to Phase II. This progression to Phase II translates into success in setting the conditions for OPMS XXI and movement forward toward sustaining the effort. I want to explain how this movement looks from my seat and give you insight into some things you need to understand as we move forward.

Phase I included three key elements – officer corps education, recoding of officer authorizations, and revision of DA Pam 600-3, *Commissioned Officer Development and Career Management.*

The OPMS XXI implementation team has traveled around the world to educate all officers. If you have not received information on OPMS XXI, it is out there. The DCSPER web page at *http://www.army.mil/opms/* contains significant information and briefings about OPMS XXI. The Fort Knox home page at *http://147.238.100.101/center* can also provide significant information about how changes to OPMS XXI will affect us. Chain teaching kits were sent to all brigade and regimental commanders. There is also the "Blue Book" on OPMS XXI, called *The Officers Guide to OPMS XXI,* which was sent to all officers. Hopefully, this article will add to what you have already heard.

DA Pam 600-3 is a crucial part of your education and addresses professional development and career management. It is the road map for implementation of OPMS XXI. This document includes critical information that details promotion boards, the career field designation process, and counseling. It is an individual career guide. To ensure that we have serviced the target in re-writing DA Pam 600-3, it has been staffed with numerous Armor officers, and I think we've hit the mark.

A significant improvement in DA Pam 600-3 is that it contains a section on character and values expected of officers. The values section includes the Seven Army Values: **L**oyalty, **D**uty, **R**espect, **S**elfless-service, **H**onor, **I**ntegrity, and **P**ersonal courage. Most of you have seen this as the acronym LDRSHIP, remembered as LEADERSHIP. An overview of the Armor chapter includes a review of officers' careers by grade, education, assignment and self-development, and branch qualification. It also details joint duty and its value, while the professional development guidance adds truth and reality to branch qualification.

Branch qualification is the key for promotion and continuation for officers at all levels. Being branch-qualified means you are professionally developed in your current grade, and you have demonstrated success in leading soldiers at that grade. For lieutenants, this requires 12 months as a TO&E platoon leader. Captains are considered branch-qualified with at least 12 months as a company-level commander. Branch qualification for majors includes at least 12 months as a battalion/squadron S3 or XO, or brigade/regimental S3 or XO. The OPMS XXI goal is that a major's branch qualification time is 24 months. We are close to achieving this goal. For lieutenant colonel and colonel, branch qualification is successful completion of command. This chapter also includes additional information on command, joint assignments, and functional area assignments. Currently, DA Pam 600-3 is undergoing review by the Army MACOMs and Army senior leaders. As soon as it is released, it will be published on the Internet. Get a copy and read it; this is your guide for your future.

What follows is a brief rundown of the professional development goals for each rank. As a new lieutenant, we want you to develop the requisite basic Armor branch skills, knowledge, and attributes necessary to be a successful company grade officer. As a captain, your goal should be to develop proficiency as a combat commander and staff officer. Entering the field grade ranks, a major's main goal should be to develop the warfighting skills, technical proficiency, and staff competency in preparation for battalion command. Lieutenant colonels should be able to demonstrate excellence in tactical skills, technical proficiency, and the ability to lead, train, motivate and care for soldiers in both battalion level command and staff environments. Sustainment of warfighting, training and staff skills, along with utilization of leader, managerial, and executive talents, are goals that a colonel should be looking toward. These are all in DA Pam 600-3 and focus on the branch qualifying jobs mentioned in Table 1.

We are still working with the OPMS XXI team to iron out the recoding of Armor positions. The goal of this process was to properly code each position by branch as to the type of officer it required, whether that be an Armor officer or a Functional Area Officer. Our job is to ensure that Armor has the right number of authorizations in all ranks to maintain a healthy branch. If we have too many or

RANK	EDUCATION	BRANCH QUAL. ASSIGNMENT
LT	OBC	Platoon Leader
CPT	OAC/CAS3	Company/Troop Command
MAJ	CGSC	Bn/Sqdn S3/XO Bde/Regt S3/XO
LTC	PCC/SSC	LTC level command
COL	SSC	COL level command

TABLE 1

too few officers at a given rank, we produce either an overabundance of officers, where too few get promoted, or a shortage of officers, where everyone gets promoted. Neither of these two situations results in a healthy branch.

The main focus of our recoding effort is to meet the Army's warfighting requirements. In coordination with the OPMS team, we came up with some very specific rules to determine the recoding of Armor positions. Unless a position fell under a specific rule, the recommendation was to code it combat arms branch immaterial. Obvious positions, such as commander of the Operations Group and senior live fire trainer at the NTC, will be coded Armor. Colonel-level directors here at Fort Knox will also stay coded Armor, along with a few critical joint positions and some chief of staff positions in our heavy divisions. We are still working with the OPMS team to determine other positions that require the unique talents of our Armor officers and that will also produce the natural progression for qualified Armor officers to get promoted.

Phase II consists of initiating the career field designation process and beginning promotion boards.

The realignment of career fields and the way we professionally develop our officers is moving toward a requirements-based management system. This means that we have finally figured out our officers must be developed the way we train. Instead of bouncing officers between operational assignments and functional area assignments, we have begun a program to organize officers who are specialized in what they do. We are focused on having different fields of officers that fill specific requirements needed throughout the Army.

Career field designation has a huge impact on Armor officers. Sixty-six percent of Armor officers will remain in the Operations career field. Basically, that means you will remain an Armor officer and have Armor-related assignments. The other 34 percent will be designated into the other three career fields — Operational Support, Institutional Support, and Information Operations. Only those that

select, desire to, and are qualified will go to another career field.

Career field designation will affect all officers. Beginning with YG89, six months prior to consideration by the majors promotion board, you must submit a Field Preference Statement. This will only be seen by the Designation Board and is not routed through the chain of command. The actual designation board occurs after selection for major. Year Group 89 officers must have their preferences in by 1 May 1999, with the designation board meeting 1-11 June 1999. Officers already in the grade of major or above will also go before the designation board in accordance with Table 2 below. Year Groups 80 and 86 must submit preferences by 1 February 1999 with the Designation Board meeting 16 March through 2 April 1999. Details of the way preferences will be entered are still being worked out. You will probably receive a notice in the mail with a userid and a password allowing you to log onto the Internet at a designated site and enter your career field preferences. The results will be given to the Career Field Designation Board for use. The year groups that will be designated in 2000 include 81, 87 and 90. The point is — career field designation is here now and affecting Armor officers. Make sure that you take the time and decide into which career field you would like to be designated, and submit your preferences on time.

Rater and senior rater portions of the new OER will influence Designation Boards in selecting officers for both branch specific and functional area assignments. Raters and senior raters must counsel their officers about the career field in which the rated officer would like to be designated. Whether you are a rated officer, rater, or a senior rater, your preferences will play a big part in the Designation Board process. The four things the board will look at are Officer Preference Statements, rater/senior rater recommendations on the OER, education and abilities, and the needs of the Army. Therefore, raters and senior raters make sure you talk to your officers about what they want to do while they are in the Army. Also make your educated recommendation on their OER. This affects not only

the officer, but also the Army. You owe it to both.

Promotion boards will undergo a change also. Officers will compete for promotion to requirements in their designated career fields and only against officers from the same career fields. This prevents any single career field from having an advantage in promotion rates, and precludes officers in the other career fields from having a reduced chance of promotion. The promotion system will still remain a fair and impartial system, promoting the most qualified officers in their respective career fields. It will not favor one field over another. So the choice is yours. Select the career field that most suits what you want to do in the Army. The intent has been to make it fair to everyone in every career field.

We do have some concerns. Right now, we feel Armor branch has an insufficient amount of officers to meet combat arms, combat arms-immaterial requirements, and have sufficient officers available to meet Armor-specific requirements. We also do not know the breakdown of combat arms and combat arms-immaterial positions that Armor will have to fill. These positions are normally found in joint, DA staff, USMA staff, AC/RC and CTC assignments. Filling these positions is a higher priority than filling our divisions. Therefore, with the number of officers that we are currently programmed to have in the future, the higher priority units will be filled to their authorized level while our divisional units will not. We are working to ensure that we have an adequate number of officers to fill our required positions. These are issues that I am currently working on as the Chief of Armor.

I cannot emphasize enough the importance of this transition period. We are headed in the right direction. We feel we have the right information out there in DA Pam 600-3, the right positions for our Armor officers at all levels to remain competitive for promotion, and that the right officers will be designated to the appropriate career fields to maintain the warfighting requirement. Forge the Thunderbolt!

CFD Board Schedule by Year Group

Year	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
CFD	*	99	00	01	01	02	02	99	00	01	99	00	01	02	03	04	05	06	07	08

*Year group 79 and earlier will be redesignated based on individual preference and ability...not by a board.

TABLE 2

DRIVER'S SEAT

The Conservative Heavy Division: Enlisted Impact

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

The heavy division reorganization has now been made public by the Chief of Staff of the Army. Supporting articles have been published in both professional and civilian publications. Briefings and interviews have been presented. A web site has been brought on line. I hope that you have read and accessed these media, and are familiar with the changes to the heavy brigade and the tank battalion. I will quickly review the changes to unit structure and then detail the armor and cavalry enlisted authorizations gained and lost, with likely impact on professional development and promotion.

There will still be six heavy divisions. All will have three brigades and a division cavalry squadron. Five divisions will contain five armored and four mechanized battalions. One division will contain four armored and five mechanized battalions.

Each heavy brigade will contain a brigade reconnaissance troop (BRT) of two scout platoons, each with six HMMWVs. The platoons are organized into a two-vehicle headquarters and two scout sections of two vehicles each.

Each tank battalion will have 45 M1-series tanks, organized into three tank companies and the battalion headquarters tanks. Loss of a tank company is the price of retaining the four-tank platoon. The battalion scout platoon will be reduced to six HMMWVs. The HHC loses the support platoon to the forward support company, which is assigned to the forward support battalion.

The division cavalry squadron retains three ground troops, each with nine M1-series tanks and 13 M3 CFVs (totals are 27 M1s and 41 M3s, including HHT).

So much for the structure; now for the impact on enlisted authorizations. Before I go further, understand that the authorizations coming out of the division's structure are not necessarily coming out of the total armor and cavalry force. We have plans to use the excess authorizations to fill other needs within our branch. These authorizations, if available, will be for use on the TDA side of our force, and could help fill the need for more drill sergeants, recruiters, instructors, etc. While this could increase an NCO's time in the various nominative assignments, armor branch will continue to manage our NCO development in order to give opportunities for leadership certification to every soldier at each grade. My centralized board guidance may change, as the impact of restructuring the total armor and cavalry force is better understood. Nominative assignments may have to be given more credit, as the boards select the best of the fully qualified for promotion.

There is minor impact on cavalry scouts. Taking into account the losses to each existing scout platoon, and the gain of the 18 BRTs, MOS 19D gains a total of 54 authorizations on the TOE side; 18 NCO and 36 Skill Level 1 (SL1). Cavalry scouts gain 36 SFC authorizations and lose 18 SSG authorizations, with no change to SGT authorizations.

There is major impact on armor crewmen. MOS 19K loses 696 NCO authorizations from the TOE side, of which 87 are SFC, 203 are SSG, and 405 are SGT; 870 SL1 authorizations are also lost.

Senior armor crewmen lose 29 1SG authorizations from the TOE side.

In the short term, there will be a promotion slowdown. The fight to avoid any "non-select" boards will have to be fought. There will be a higher level of fill in some units, for the personnel system will need time to catch up with the changes and gradually move soldiers to understrength units, as well as to the increased number of TDA authorizations. The promotion slowdown will not be as bad for scouts, because the selection rate for SSGs will temporarily increase to fill the need for SFCs. There is a possibility for reclassifications or early outs to reduce overages of 19K soldiers. SL1 armor crewmen will certainly face reclassification or early out, for there will be relatively few 19K SL1 authorizations moved to TDA units.

Over the long term, MOS 19K will even out, since the reduction in TOE authorizations occurs proportionally among all grade levels. A healthy pyramid of professional development and promotion will be restored and maintained.

Implementation of CHD structure is beginning in 4ID. The timeline for reorganization of all divisions is still being worked. If done gradually, soldiers can be moved to fill understrength units and excess authorizations can be relocated into TDA units. If done quickly, it will be much harder to take care of our soldiers. In either case, we NCOs must implement the decisions of our leaders to reorganize the division. With new and more lethal weapons, and with improved systems for situational awareness and command and control, our units can be more effective. However, they will be more effective only if filled with well-trained and motivated soldiers at all grades. That is our mission: to understand, explain, motivate, train.

"SERGEANT, TAKE THE LEAD"

Will Airpower, Specifically Helicopters, Replace Tanks in 2010?

by Major John W. Blumentritt, USAF

"Flying tanks" have long been objects of speculation.[1] Some U.S. Department of Defense officials are questioning if, by 2010, joint force commanders should replace conventional tanks by employing "sophisticated attack and supporting helicopters"[2] to dominate force, time, and space. The potential outcome could be that joint force commanders, by employing these helicopters decisively, would cause tanks to become obsolete memories.

Are tanks going to be memories in 2010? This study proposes that yes, tanks may be memories in 2010, but in the form of bad memories to an enemy who confronts them.

Helicopters will not replace tanks in 2010. Tanks are not only compatible, but also unique, integral parts of the dominant maneuver vision as outlined in *Joint Vision 2010*. Instead of attempting to employ helicopters as "flying tanks," Joint force commanders should use helicopters as airpower assets, thus allowing them to operate in their full multidimensional perspective.

Airpower and Landpower Doctrine

Airpower proponents predominately advocate that war has been fundamentally transformed by the advent of the airplane.[3] Air Force Doctrine Document 1 states that given the right circumstances, airpower can dominate the entire range of military operations in the air, on the land, on the sea, and in space.[4] Although this information is more far-reaching than the helicopter-tank issue, it is important to explore because helicopters, regardless of service component, are forms of airpower.

Airpower literature, overwhelmingly dominated by U.S. Air Force fixed-wing professionals, does not frequently espouse the helicopter. In addition, Army helicopters are normally not included in the air apportionment process or air tasking orders.[5] Helicopters, however, are ideally suited for rapid reaction in close, deep, or rear operations.[6] Despite the Army's reluctance to lose control of one of its most important maneuver assets to the Joint Force Air Component Commander (JFACC),[7] helicopters are capable of joining fixed-wing counterparts as airpower assets.

Landpower proponents do not disagree that airpower is important. They are more concerned, however, with sustained presence on the ground. The U.S. Army publishes, "U.S. land forces provide the most visible, sustained foreign presence on the ground, 24 hours a day, person-to-person, cooperating, sharing risks, and representing America."[8] In addition, in his article, "The Future of Armored Warfare," U.S. Army Lieutenant Colonel Ralph Peters argues, "The…dynamics of battle will demand grounded systems for many years to come."[9] Lastly, the U.S. Army and Air Force have developed "flyaway packages" tailored to airlift significant combat power to a theater within a short time. For example, one package consists of 14 M1A1 tanks, 15 Bradley Fighting Vehicles, and 335 soldiers, all ready to move within 48 hours of notification.[10] While the specifics on these packages are not significant, these examples illustrate the commitment the U.S. Army has on quickly placing people and heavy equipment on the ground.

Are helicopters simply support tools for tactical occupational forces, or can they be used as significant airpower assets at the tactical, operational, and strategic levels of war? The literature varies. For example, in the article, "American Armor in the Ground War Against Iraq," a first-hand account of armor operations during the 1991 Gulf War, Gregory Smith does not mention airpower or attack helicopters,[11] despite the fact they supported the armor advance.[12] Perhaps Smith regards their role as support for the offensive forces, similar to the also unmentioned, but equally necessary logistic assets. Further research, however, indicates helicopters have built strong reputations as airpower assets. U.S. Army AH-64 Apache helicopters disabled Iraq's early warning radar during the opening moments of the 1991 Gulf War, allowing coalition airplanes to pour into Iraq undetected.[13] Both airpower and landpower literature supports having helicopters, but confusion exists on whether Joint Force commanders should replace tanks with them, or employ them as airpower assets.

Unfortunately, *Joint Vision 2010* does not clear up this confusion. For example, it states that by 2010, there should be less need to mass forces physically. Later, however, it notes there will still be a need for "boots on the ground" in many operations.[14] With the importance the U.S. Army gives to moving large amounts of armor into theaters, "boots on the ground" logically includes accompanying "treads on the ground."

Officials assigned to the Future Concepts Division of the Joint Warfighting Center, who write supporting concepts for *Joint Vision 2010*, are searching for clarification on this issue. They are concerned tanks may not be consistent with the concept of dominant maneuver as found in *Joint Vision 2010*. Dominant maneuver calls for "decisive speed and tempo" to apply overwhelming force to enemy centers of gravity. They are questioning if the land force of the future should rely on advanced, heavily armed helicopters to replace the relatively slow tank to fulfill the concept of dominant maneuver. An official from this organization writes:

"Transporting tanks to a contingency takes a lot of time, and once there, they don't move very quickly. It seems that specially equipped helicopters, flown by experienced crews, could accomplish this mission. Using information superiority,

sophisticated helicopters armed with advanced weapons may be the attack forces of the future. Supporting helicopters could have infantry inside to land after an attack and do a quick "mop up" and then withdraw. Other helicopter forces could (or would) attack the enemy as vulnerabilities arise."[15]

This study makes the assumption that these "sophisticated helicopters armed with advanced weapons" are current helicopter airframes, and not limited to just U.S. Army attack helicopters. These helicopters, referred to as "flying tanks," could be AH-64 Apaches, enhanced H-60 Black Hawks, or even specially armed CH-47 Chinooks. Helicopter design and type is less important to the joint force commander than techniques of employing these assets at the operational and strategic levels of war.

The Geostrategic Environment

To understand the synergistic relationship between airpower, helicopters, and armor, one must first understand the geostrategic environment land forces of the future will operate in. During the Cold War, the U.S. Army was relatively certain what the threat was and from where it would come. Had the Soviets invaded Western Europe in 1989, the U.S. Army, consisting of 800,000 troops armed with thousands of tanks and helicopters, would have countered them.[16] This massive force, coupled with strong sister-service partners and formidable allies, effectively served as a deterrent.

In addition, the disintegration of the Soviet Union decreased the threat that limited conflicts around the globe could ignite a world war between superpowers. Unfortunately, the end of the Cold War also resulted in a new and expensive security challenge. Rogue nations, now unrestrained by a coercive superpower, tend to be more willing to use force within and across borders.

Between 1950 and 1989, the U.S. Army participated in 10 major deployments, but from 1990 to 1996, the U.S. Army deployed 25 times.[17] Most of these commitments called for soldiers to be on the ground, directly interfacing with the civilians and/or military involved in the crisis.

The full spectrum of Army capabilities may be required to prosecute diverse missions, ranging from disaster relief, through military operations other than war, to perhaps global war within the next decade.

— USAF Photo

Some of these missions will be best suited for airpower and helicopters, while tanks may best accomplish others. Most should be accomplished by a synergistic combination of the two, based on their capabilities and limitations. As the characteristics of helicopters and tanks are explored, the following recurrent theme occurs: *helicopters cannot in some cases, and should not in others, replace tanks.*

Keep Tanks

Tanks do not normally operate directly at the operational and strategic levels of war, however, they are an indirect means to that end. Joint force commanders can exploit the tank's capabilities, many of them not shared with helicopters.

First, tanks are the backbone of ground forces, and ground forces hold ground. Tanks, in mass, can demolish pockets of enemy resistance as they move forward. Many experts feel that airpower, unlike troops and tanks, cannot hold ground.[18]

History documents that control of the land often requires seizing it from opposing ground forces. For example, the October 1993 Battle of Mogadishu was fought under conditions that "begged for armor."[19] The commander, based on operational security concerns, had earlier requested U.S. armor capabilities, but instead, armed helicopters and AC-130 gunships were used, with disastrous results.[20]

Without armor, U.S. forces had no way to rescue the survivors of this battle, and had to organize an ad hoc extraction force using Malaysian and Pakistani tanks.[21]

Many examples of helicopters failing to control the ground occurred during the Vietnam War. The "flying tank" concept is similar to the "search and destroy" tactics employed by Army Aviation in Southeast Asia. Airmobility allowed the swift relocation of forces by leapfrogging them over obstacles on the ground.[22] The problem with this, however, was that once the helicopters left, the Vietcong would reemerge, move back into the villages, and regroup unopposed. Army Colonel Delbert Bristol, a Vietnam veteran, said in an interview, "*I still think that the Army exists to seize and hold terrain. To a certain degree you have to stay on the terrain in order to do that, and I think to that degree we may have erred a little bit in our conduct of the Vietnam War. More than a little bit.*"[23]

Normally, helicopters do not dominate the land or hold ground by flying overhead or firing weapons. Ground forces, supported by armor, are much more suited to these tasks. Helicopters could not replace ground forces and tanks in Vietnam or Somalia. They will not replace tanks in 2010.

Second, tanks are very powerful symbols and useful instruments of war and diplomacy, throughout the spectrum of warfare. Many feel it was the thousands of allied tanks rolling forward that made Saddam Hussein abandon Kuwait in 1991, not the helicopters flying around.[24] Airpower probably killed more Iraqi troops, but the dominant images of the Gulf War were tanks rolling into Kuwait City amid cheering, flag waving, Kuwaiti citizens. On the lower end of the scale, helicopters flying over rioting mobs during the 1992 Rodney King crisis did not effectively control crowds. Forces on the ground, backed by armor units and supported by helicopters, stopped rioters in Las Vegas, Nevada, from encroaching into crowded tourist areas.[25] Although this particular example is a domestic and

tactical police issue, it provides a superb example of how leadership effectively employed powerful symbols to control behavior and hold ground. Tanks have historically carried political messages throughout the levels of war.

A third capability of tanks, unlike helicopters, is their ability to operate in bad weather. High winds, severe turbulence, extremely low clouds, poor visibility, and freezing rain may slow down tanks. These conditions, however, may render hundreds of helicopters throughout the theater completely ineffective. For example, the U.S. Navy prohibits all UH-1N helicopters from flying during any icing conditions.[26] Since icing can occur throughout an entire theater, this common winter event would be significant, since all "flying tanks" with this limitation would be unusable. Bad weather may bog down tanks, but tanks are still less susceptible to adverse weather than helicopters.

A fourth tank capability is that of the crew. Tank operators are less expensive to train, easier to replace, and not as endurance limited as pilots. An after-action report, published after a recent division advanced warfighting experiment, highlighted this endurance issue. In this report, a Cavalry officer writes, "…*need more crews than aircraft. Endurance of the airframe was greater than the crew endurance.*"[27] This is in contrast to the Smith article, where he describes a continuous armor advancement through Iraq over several days, stating, "*There was to be no rest for the battalion.*"[28]

Operational airpower artists understand that airpower cannot be sustained in this way, and must be scheduled properly to ensure continuous operations. Helicopters, limited by both equipment and crew, cannot operate like tanks nor could they have replaced them in the armor assault of Iraq.

Replace Tanks?

Helicopters are oppressive weapons. They can get into the fight quickly, and once there, accomplish a myriad of different missions. Perhaps it is these superb capabilities that, unfortunately, gave birth to the idea of "flying tanks." Critics of tanks could counter-argue many of the previous points, or even create new arguments for replacing tanks with helicopters.

First of all, one could argue that it is simpler and quicker to get helicopters into a theater than tanks. For example, a C-5 transport aircraft can move one M1

tank,[29] or four H-60 helicopters.[30] In addition, many helicopters can self-deploy. Enhanced by air-refueling capabilities, many helicopters can fly to a fight thousands of miles away, then be ready to fly combat missions upon arrival. Tanks normally move via ship, and are not suited to administratively traverse great distances to fight.

Although these facts are true, two issues negate this argument. First, if helicopters will be ineffective in a crisis that requires armor, such as the battle of Mogadishu, it is not logical for a joint force commander to use them just because they arrive first. He should select the proper tools that do the job effectively. As for the speed of arrival issue, "flyaway packages," coupled with numerous pre-positioned ships filled with equipment, change the way the U.S. Army views deployments.[31] If a joint force commander needs tanks, the U.S. logistic system is set up to get them to him in a hurry.

A second argument could be that helicopters are more mobile than tanks. Helicopters can circumvent threats, fly over terrain, and easily transit between ships and the shore. Unlike tanks, helicopters can exploit elevation. Unencumbered by terrain, helicopters can quickly move to different locations within the theater. Tanks are much more geographically challenged than helicopters. Rough terrain, swamps, rivers, and other obstacles, easily circumvented by helicopters, must be negotiated by tanks. Since tanks move slower than helicopters, critics could argue they are not consistent with the concept of dominant maneuver, as found in *Joint Vision 2010.*

There is no argument that helicopters are more mobile than tanks. However, even if traversing ground is difficult, it is still necessary. U.S. Army General Robert R. Williams, on discussing airmobility operations in Vietnam, points out the difficulty of land warfare. He writes, *"You have to fight it down in the muck and the mud at night, and on a day-to-day basis. That's not the American way and you are not going to get the American soldier to fight that way.*"[32]

Although General George Patton understood the difficulties of land warfare, he also realized the importance of holding ground. His resourcefulness, leadership style, and tenacity made the seemingly impossible happen. In the book *Nineteen Stars*, Edgar Puryear writes. "(*General Patton) did everything possible to get his Army to drive, drive, drive. A town that could not be captured swiftly was bypassed, to be strangled to death while his*

troops pressed after the quarry, like hounds baying for a kill."[33]

In both these historical examples, commanders had very mobile airpower assets, but that did not equate to control of the ground. Today, the United States has firm control of the air over Bosnia and Iraq, however, that control is not wholly relevant to actions on the ground.[34] In 2010, helicopters may be moving quickly over contested settlements or terrain, however "boots and treads" will be fighting and holding ground below them.

As for the dominant maneuver issue, operational artists must understand decisive speed and tempo do not equate to miles per hour. Tank commanders must coordinate on the proper speed and tempo to achieve the decisiveness sought by joint force commanders. For example, open desert warfare may require a swift armor assault, while combat in an urban setting may call for a relatively slow, methodical armor advance. Helicopters may move faster than tanks; however, if flying over the enemy is not effective, then it is not decisive, nor does it affect the tempo, and it dominates nothing.

A third argument "flying tank" proponents could make is that tank warfare is synonymous with bloody attrition warfare while airpower is not. For example, helicopters began attacking targets in Iraq and Kuwait on 17 January 1991, while coalition land forces did not cross the Saudi-Iraq border until 24 February.[35] Perhaps this delay was due to the vulnerability of ground forces, the likelihood of attrition warfare, and the theory that U.S. attrition rates would drain the will of the American people. Saddam Hussein felt this way. He told a U.S. Ambassador on 25 July 1990, "*Yours is a society which cannot accept 10,000 dead in one battle.*"[36]

This argument makes three assumptions: tank warfare is synonymous with attrition warfare; the goal of war is to avoid bloodshed; and "flying tanks" will accomplish that goal. If these assumptions were true, Joint force commanders would undoubtedly replace tanks with helicopters.

Reality, however, is not that simple. In *On War*, Clausewitz described the reality of warfare, "*Kind-hearted people might of course think there was some ingenious way to disarm or defeat an enemy without too much bloodshed, and might imagine this is the true goal of the art of war. Pleasant as it sounds, it is a fallacy.*"[37]

First of all, land warfare and tanks do not hold the monopoly on attrition warfare. For example, one could argue strategic bombing in World War II degenerated into attrition warfare, as did helicopter operations in Vietnam. Clausewitz negates the second assumption in this argument by pointing out that avoiding bloodshed is not the goal of war. Lastly, since military objectives make up the goals of war, helicopters are suited well for some, while tanks are suited better for others. This argument, supported by faulty assumptions, does not support replacing tanks with helicopters.

A fourth argument could assert that since helicopters are more flexible than tanks, helicopters should replace them. For example, some helicopters can deliver ordnance behind enemy lines one day, then provide close air support to friendly forces the next. MH-53J *Pave Low* helicopters led AH-64 Apache attack helicopters to targets, flew rescue missions, and searched for mobile Scud launchers.[38] Not all "flying tanks" could do all these missions, but when compared to tanks, helicopters offer many more options.

Taking this argument one step further, one could comment that because of the helicopter's speed and flexibility, Joint force commanders do not have to limit employing them at just the tactical level of war. Since it is argued that airpower is inherently a strategic force,[39] and helicopters are forms of airpower, many helicopters can conduct operations that have operational or strategic effects. For example, helicopters could conduct preparations for a major operation, normally classified as operational fires,[40] in the form of early destruction of enemy airfields and aircraft on the ground. Unlike helicopters, tanks are not suited to instantly operate at the operational and strategic levels of war. Tanks are normally in tactical units, designed to fight through enemy forces in an effort to position themselves for decisive, strategic operations.[41] In this example, helicopters are more capable than tanks.

If "flying tanks" could do all these missions throughout the tactical, operational, and strategic levels of war, in addition to effectively replacing tanks, Joint force commanders would surely select this economically advantageous option. Reality, however, negates this "helicopters can do it all" argument.

The first part of this argument assumes helicopters can effectively replace the mission of tanks, an issue previously

negated. The second part of this argument asserts that "flying tanks" could also be effectively employed as airpower assets. To understand why they cannot requires a discussion on both helicopter aerodynamics and command and control.

First, high performance helicopters, defined by superior maneuverability and agility, fly faster, turn sharper, ascend and descend quicker, and evade threats better than heavier helicopters.[42] In addition, British tank expert R.M. Ogorkiewicz, argues for the development of thicker tank armor to defeat new anti-tank threats, resulting in a weight of approximately four metric tons per square meter.[43] This is too much weight for a helicopter. These details may be immaterial to joint force commanders, but the message they illustrate is critical. Put simply, high performance helicopters, equipped with the armor and modifications to make them "flying tanks," are no longer high

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"First and foremost, this research supports the recommendation that joint force commanders should not replace tanks with helicopters. Helicopters can supplement, augment, and support tanks; however, they are not able to replace them."

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performance helicopters. In this configuration, these sluggish helicopters could not be exploited to their full potential as airpower assets. "Flying tanks" would lose their unique ability to strike operational and strategic targets in threatened areas. Lieutenant Colonel Peters warns: "*A very real danger…is asking any system to do too many things, resulting in a system that does nothing especially well.*"[44]

The second issue that corrupts this "do it all" argument is command and control. "Flying tanks" would most likely be owned or parceled out to armor commanders, thus unavailable for full exploitation as airpower assets. Joint force commanders should use helicopters as forms of airpower, versus tethering them to armor units as "flying tanks."

The importance of unity of command and unity of effort, coupled with the realization that helicopters will not reach their full potential unless allowed to operate in the full multidimensional perspective, are reasons why.

Conclusion

Tanks will remain formidable weapons until at least 2010. Tanks are consistent with dominant maneuver, specifically decisive speed and tempo, as directed by *Joint Vision 2010*. Their symbolic presence, ability to demolish enemy resistance, and hold ground effectively, makes them decisive. Miles-per-hour does not equate to decisiveness.

Joint force commanders should not use helicopters to replace tanks. Tanks provide "boots on the ground" presence throughout the spectrum of warfare. To best support ground forces, agile and maneuverable helicopters should be used in synchronization with other airpower assets to provide close air support, air interdiction, or any other missions more suitable to their capabilities. It would be dangerous to parcel out helicopters to armor commanders, thus making them unavailable for exploitation as powerful airpower assets.

Recommendations

First, this research supports the recommendation that joint force commanders should not replace tanks with helicopters. Helicopters can supplement, augment, and support tanks; however, they are not able to replace them. The geostrategic environment of 2010 will call for soldiers to be on the ground, directly interfacing with people involved in the crisis. Unlike helicopters, tanks will provide a "boots on the ground" presence throughout the spectrum of warfare. As U.S. Air Force Colonel Richard Szafranski highlights in his article "Twelve Principles Emerging From Ten Propositions," "*Airpower can blow a door off of its hinges, but, unlike a simple soldier or marine, airpower cannot see what is behind the door.*"[45]

Secondly, since tanks are necessary, armor units must receive the support they require to get into the fight. For example, staffs must work out the logistics of moving ample numbers of tanks into the theater, then establish and protect healthy logistics trails. "Flyaway packages" and prepositioned ships are invalidating the paradigm that it takes too long to get tanks into a theater. Joint force commanders must understand that if they need tanks, they should request them, and then let the logistics system go to work.

Third, operational artists must understand that decisive speed and tempo is not defined in miles per hour, but instead as the appropriate speed and tempo required to be decisive. The concept of "flying

tanks" is similar to what the military used in Vietnam. In Vietnam, helicopters had greater speed than ground forces, but this speed did not affect the tempo or the decisiveness of those operations. This is a complex concept, and one that should be articulated, published, then disseminated by the Joint Warfighting Center in a future *Joint Vision 2010* supporting concept publication.

Will tanks be memories in 2010? Perhaps a potential adversary will understand and remember these powerful symbols can be deployed within hours anywhere in the world. Perhaps he will ascertain they will dominate his land, despite the weather or terrain. If this rogue leader understands tanks will be used against him, in combination with fixed-wing and helicopter assets, perhaps he will be dissuaded from even initiating hostilities. If deterrence fails, Joint force commanders can unleash an overwhelming force of tanks upon this enemy. Following the conflict, tanks will indeed become fresh and impregnable memories in the minds of the international community.

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Training Rules of Engagement: Beyond the Briefings

Soldiers Need Clear Standards and Good Examples

by Captain Daniel M. Froehlich

Posavina Corridor, Bosnia-Herzegovina: Private First Class Thompson, a 19-year-old M1A1 driver, occupies a checkpoint along a major thoroughfare. Elsewhere in the zone of separation, other members of the heavy task force conduct dismounted patrols along back roads. The unit is tasked with monitoring and enforcing the peace accord. Prior to his[1] deployment, PFC Thompson received several weeks of training in Germany on Stability and Support Operations (SASO). During the training, he was instructed that "if attacked or facing a clearly imminent attack," he was to use "necessary force" to defend himself. In addition, his leaders educated him on the importance of avoiding excessive force in his dealings with the native population, and his liability under the Uniformed Code of Military Justice (UCMJ) if he overstepped the boundary of "excessive force." During his week-long stay in Bosnia, Thompson has received daily Rules of Engagement (ROE) briefings that constantly adjusted the conditions under which he was expected to accomplish his somewhat ambiguous mission. The briefings issued changes on the control and arming status of his weapon and ammunition, added or removed prohibitions on the use of the weapon systems on his M1A1 tank, and dictated various measures to be taken to detain "criminals," among other instructions. The pocket of his flak jacket contained the waterproofed ROE "Blue Card,"[2] at right.

With his supervisor temporarily absent, PFC Thompson notices a van approaching the checkpoint at about 40 miles per hour. As it comes within 75 meters of the wire barrier at the front of his position, he realizes that the van has not begun to decelerate. Thompson has less than five seconds to choose and execute a course of action, under high-stress conditions. Further muddling his decision process, the ROE have fluctuated daily, and, his platoon leader admits, "have a lot of gray area."[3]

Despite the best of intentions and herculean efforts by commanders and their staffs at all levels, the current approach most U.S. Army armored units[4] use to translate ROE into applicable knowledge is inadequate. It is critical for armored force commanders to find an effective method to convey rules of engagement to soldiers. Without clear standards and good examples, two dangers will con-

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OPERATION CONSTANT GUARD
COMMANDER'S GUIDE ON USE OF FORCE

MISSION

Your mission is to implement the Peace Plan.

SELF DEFENSE

1. You have the right to use force (including authorized weapons as necessary) in self-defense.

2. Use only the minimum force necessary to defend yourself.

GENERAL RULES

1. Use the minimum force necessary to accomplish your mission.

2. Hostile forces/belligerents who want to surrender will not be harmed. Disarm them and turn them over to your superiors.

3. Treat everyone, including civilians and detained hostile forces/belligerents, humanely.

4. Collect and care for the wounded, whether friend or foe.

5. Respect private property. Do not steal. Do not take "war trophies."

6. Prevent and report all suspected violations of the law of armed conflict to superiors.

CHALLENGE AND WARNING SHOTS

1. If the situation permits, issue a challenge:

IN ENGLISH	"SFOR, STOP OR I WILL FIRE!"
OR IN SERBO-CROAT:	"SFOR, STANI ILI PUCAM!"
Pronounced as:	"SFOR, STANI ILI PUT SAM!"

2. If the person fails to halt, you may be authorized by the senior soldier present or by standing orders to fire a warning shot.

OPENING FIRE

1. You may open fire only if you, friendly forces, persons or property under your protection are threatened with deadly force. This means:

   A. You may open fire against an individual who fires or aims his weapon at you, friendly forces or persons under your protection.

   B. You may open fire against an individual who plants, throws, or prepares to throw an explosive or incendiary device at you, friendly forces, or persons or property under your protection.

   C. You may open fire against an individual who deliberately drives a vehicle at you, friendly forces, persons with designated special status, or property designated special status.

2. You may also fire against an individual who attempts to take possession of friendly force weapons, ammunition, or protected property, and there is no other way of avoiding it.

3. You may use minimum force, including opening fire, against an individual who unlawfully commits, or is about to commit, an act which endangers life or is likely to cause serious bodily harm, in circumstances where there is no other way to prevent the act.

MINIMUM FORCE

1. If you have to open fire, you must: fire only aimed shots, and fire no more rounds than necessary, and take all reasonable efforts not to unnecessarily destroy property and stop firing as soon as the situation PERMITS.

2. You may not intentionally attack civilians or property that is exclusively civilian or religious in character, except if the property is being used for military purposes and engagement is authorized by your commander.

NATO UNCLASSIFIED

tinue to threaten mission success. The first danger is that soldiers will not respond to a threat aggressively enough, endangering themselves, other soldiers, or critical facilities. The second danger is that soldiers will respond too aggressively, needlessly harming noncombatants, and possibly jeopardizing strategic or political goals.

Before exploring the characteristics of the current ROE model, it is necessary to discuss the definition and function of ROE. Rules of Engagement are the "directives issued by a competent military authority which delineate the circumstances and limitations under which U.S. forces will initiate and/or continue combat engagement with other forces encountered."[5] ROE are created to serve a variety of political, diplomatic, legal, and military purposes. They are based on two core rules: necessity and proportionality. In order for U.S. forces to use force, a hostile act or hostile intent must be present (necessity), and the force must be scaled in magnitude, duration, and intensity to the threat (proportionality). Specific ROE are dictated by commanders using a formula of restrictions, situational guidance, and readiness postures. For example, a unit may have its ROE defined by weapons control status, alert conditions, challenging procedures, or territorial restraints.[6]

What constitutes a "good" set of ROE? In general, successful ROE must be internalized by the soldier, and must:

> *guide the soldier to wary but restrained actions, both in combat when facing civilians or prisoners, and in operations other than war when facing any individual or force that the command has not declared hostile. Just as important, these "baseline" ROE must guide the soldier to initiate aggressive action, regardless of the environment, against those who either fit the description of a previously identified hostile force or display hostile acts or intentions toward American forces.*[7]

The current process most U.S. armored forces use to convey ROE to soldiers relies on a legislative paradigm to influence soldier conduct. In other words, ROE are written as a series of "laws" that authorities issue and that soldiers are required to interpret and obey.[8] Examples of these legislative expressions can be found in operations orders, annexes, and on laminated note cards throughout U.S. and other land forces. U.S. Army doctrine sanctions the current model.[9]

The legislative model relies on the individual soldier to translate and make rapid decisions based on a dynamic list of rules that he may not have memorized and almost certainly has not internalized. This can unnecessarily jeopardize mission accomplishment and soldier well-being. To begin with, it is virtually impossible for commanders to control concrete situations using abstract rules. For example, the ROE card the soldier in the above scenario carried in his flak jacket is far from clear on exactly what he should do if he spots a man with an RPG in a crowd of civilians. Under the legislative paradigm, developers of ROE have two options: Either attempt to foresee every possible scenario, and address them with specific rules, or rely on the soldier who is on the ground to make a decision based on a more generic list of rules. The former tends to generate a long, complex tangle of rules, requirements, and explanations that may begin to contradict each other and require the soldier to sift through lists to find the appropriate response. Sifting through lists is fine for attorneys and accountants; unfortunately, soldiers rarely have that kind of time in a threat situation. Attempts to address all contingencies are doomed to fail due to the sheer complexity of the real world.

Trusting soldiers to react appropriately using a short rule list as a guide seems preferable, given the U.S. Army's justifiable pride in the individual initiative of its personnel. Unfortunately, the legislative model tends to have a negative effect on soldier initiative. Ground troops, reluctant to use force out of fear they will be punished for responding excessively, have a tendency to respond tentatively to threats. Reports from U.S. operations in Lebanon in 1983, Panama in 1989, Somalia in 1993, and, most recently Bosnia, indicate that soldiers and Marines tend to be very nervous about invoking ROE to defend themselves. This problem partially contributed to the devastating suicide bombing of the Marine Corps barracks in Beirut in 1983.[10] It is simply a matter of time before another U.S. service member fails to react aggressively enough.

The opposite hazard, that of a soldier or unit acting too aggressively, is also increased by the legislative model. Both dangers are due to soldiers' inability (or lack of confidence in their ability) to interpret and apply the ROE. Like any other military skill, the key to successful implementation of ROE lies in effective, result-oriented training; the more the better. Unfortunately, the legislative ap-

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STANDING RULES OF FORCE
FOR THE INDIVIDUAL SOLDIER

"R-A-M-P"

Return fire with aimed fire. Return force with force. You always have the right to repel hostile acts with necessary force.

Anticipate attack. Use force first if, but only if, you see clear indicators of hostile intent. **(Hand SALUTE)**

> **Hand:** What is in his hands?
>
> **S**ize: How many?
>
> **A**ctivity: What are they doing?
>
> **L**ocation: Within range?
>
> **U**niform: Are they in uniform?
>
> **T**ime: How soon before they are upon you?
>
> **E**quipment: If armed, with what?

Measure the amount of force that you use, if time and circumstances permit. Use only the amount of force necessary to protect lives and accomplish the mission. **(VEWPRIK)**[14]

> **V**erbal warning
>
> **E**xhibit weapon
>
> **W**arning shot
>
> **P**epper spray
>
> **R**ifle buttstroke
>
> **I**njure with bayonet
>
> **K**ill with fire

Protect with deadly force only human life, and property designated by your commander. Stop short of deadly force when protecting other property.

proach makes it extremely difficult to train soldiers before a crisis occurs. Under the current system, after authorities have decided to commit U.S. heavy forces into a theater, the ROE for the current situation is disseminated to the deploying units. The units then begin their initial training on the ROE. There are two problems with this approach. First, it minimizes the amount of time available for ROE training. As the U.S. Army moves to a force projection force, the time gap between the decision to commit heavy forces and their actual deployment is shrinking. While most heavy units now in Bosnia received extensive theater-specific ROE training, that may not always be the case. Second, the training is focused on one particular crisis scenario. The only portion of the legislative model ROE that remains constant is some type of self-defense clause, and even that is interpreted differently throughout the Army. Standardized, thorough training on ROE within the armored force is virtually non-existent.

U.S. heavy forces need a standardized, flexible, training-based model that can impart an ROE foundation in a fashion that allows soldiers to internalize key principles, rather than attempting to memorize unique lists of rules during specific operational deployments. Fortunately, such a model already exists. It has been used successfully for several years by the XVIIIth Airborne Corps, including the then-24th ID (Mech), as the basis for ROE training and execution. The model is based on the acronym R-A-M-P.[11] RAMP is to ROE what METT-T[12] is to tactical decision making, or SPORTS[13] is to correcting a malfunction of an M-16 rifle. It is a mnemonic device that captures standing rules of force for the individual soldier.

The RAMP system has several advantages over the legislative model currently in use by most U.S. heavy forces. First and foremost, it is a system, not just a collection of rules. While RAMP can never replace specific ROE for a given situation, it allows leaders to conduct standardized ROE training far enough in advance to be effective, not just when a deployment into a crisis is approaching. Instead of trying to communicate appropriate responses to an unlimited number of contingencies using daily briefings and laminated cards, RAMP provides leaders with a foundation on which they can base objective training. Training should focus on the individual's ability to apply the RAMP rules in his decision making. This process allows soldiers to develop their analytical skills and mentally organize the

feedback they receive using the RAMP framework. This is preferable to training with a set of ROE that changes from mission to mission. Because soldiers can easily memorize the RAMP principles, they are able to focus on the situation, rather than trying to remember what the laminated card in their pocket says. While conditions affecting their interpretation of the principles may change, the principles themselves do not. By training with RAMP, soldiers can internalize principles through rehearsals and situational training, increasing their ability to make good decisions during an actual event. In the same way that the mnemonic device "METT-T" helps a leader correctly analyze a tactical situation, or that "SPORTS" enables a rifleman to rapidly clear a deformed cartridge from a muddy rifle at night, RAMP assists soldiers by organizing their experiences gained through training. Under stress, a soldier will instinctively refer to familiar principles. These principles, reinforced by the associated experiences gained by the soldier over time, will guide his responses to crisis situations across the entire range of conflict.

As alluded to above, RAMP provides a flexible framework that can be tailored for specific missions. This allows units to conduct general ROE training on a basic model, while allowing for a complex set of contingencies. Each component of RAMP can be supplemented based on the mission criteria. For example, soldiers can be instructed to consider anyone wearing the uniform of the North Korean People's Army to be demonstrating "hostile intent," thereby subject to a preemptive strike under the principle of "Anticipate attack." Another example: when conducting stability operations, a commander could stipulate engagement criteria for a tank main gun by adding specific instructions to the "Measure the amount of force" rule. These adjustments can be pre-planned and standardized by division staffs using ROE annexes and ROE Alert Conditions (ROECONs).[15] This allows commanders to supplement the core RAMP rules with additional controls while providing the basis for training scenarios and unit Tactics, Techniques, and Procedures (TTPs). The result is a model that is training-based and that is applicable in operations from disaster relief to high-intensity conflict.

Armored forces will continue to be called upon to perform an increasingly complex set of missions. These missions carry with them an equally complex set of ROE. The current legislative model of ROE development and dissemination is

not equal to the challenge. An effective system to train the armored force on ROE prior to deployment is badly needed. The new model would need to give the individual soldier a chance to make decisions based on internalized principles, reinforced by experiences collected in training. An additional challenge to leaders is to prepare their soldiers for non-traditional operations efficiently, maintaining as much focus as possible on the business of war. The RAMP model of standing rules of force provides a highly effective, training-based method of imparting a working knowledge of ROE to soldiers. It is a highly flexible system, providing a foundation of understanding that can be readily expanded to support the full spectrum of conflict. As such, training on ROE using RAMP supports the non-traditional roles of an armored force without detracting from its warfighting focus.

How might the RAMP model help PFC Thompson resolve his dilemma? With the van rapidly approaching his position, his adrenaline begins to flow. Thompson quickly glances around to see if any of his supervisors are noticing the threatening scenario unfolding. Unsure of the magnitude of the threat, realizing that he is on his own, he takes action.

Anticipating attack, he chambers a round, and moves the selector switch on his M-16A2 rifle off "safe." Measuring the amount of force against a possible but uncertain threat, he fires several rounds at one of the van's front tires, causing it to burst. Soldiers and civilians in the area dive to the ground at the sound of the gunshots. The van swerves, and comes to a skidding halt to the side of the road, thirty meters from the checkpoint's first barrier.

The driver and his passengers, a group of young adolescents, climb out of the vehicle, visibly shaken. After a discussion with the U.S. forces' translator, it becomes apparent that the driver, momentarily distracted by some teenage horseplay in the back of his van, had taken his eyes off the road ahead of him. After gathering his wits, the driver begins to demand reimbursement for the damage done to his van.

Given 20/20 hindsight, the private made an adequate, if imperfect decision. That, however, is irrelevant. In an imperfect world, he must make his choices based on incomplete information and under severe time constraints. What is relevant is that the RAMP training he received gave him an accessible, logical framework on which he based his decision.

Heavy Traffic: Troops in Bosnia Deal with Problem Drivers

by Master Sergeant Mark A. Schulz

When a Bradley Fighting Vehicle comes upon a irate Bosnian on a bicycle, who wins? The executive officer of Company C, 2nd Infantry Regiment produced his own answer in a recent incident.

"The man came up and stopped in front of my Bradley and was telling me, in English, 'Why are you in my country?' and 'You need to get out of my country'," said 1LT William Jacobs. "I told him to get out of my way." The man refused.

Jacobs eased the Bradley forward. When he did, it pushed the man back, and caused the bicycle to fall.

Jacobs then moved forward, and the vehicle track folded the bicycle up and kicked it out the back tossing it up into the air.

"The man wasn't hurt, but he sure was mad."

This was only one of the incidents encountered by Jacobs and other members of Company C when they were ordered to secure the municipal building in Bijeljina. They made three trips to the city that day. They were met the first time by large groups of citizens on almost every block.

"We got hung up at the main intersection," said Jacobs. "They had trucks pulled in front of us, trucks pulled be-hind us, and they threw rocks at us for a while, cussed at us and spit at us."

"But they really didn't seem committed to the cause, because when we showed any kind of aggression they would move on to the next vehicle," said Jacobs. The vehicle that sustained the most damage was an unarmed medical truck.

"When we got ready to leave," he said, "I think they understood that we were capable of doing it if we wanted to. We ran over probably a dozen cars, ran over fences and through their yards. People were jumping into their cars to move them before I got there."

"I took out a fence and a couple of street signs to avoid cars with people in them," said Jacobs.

A similar situation was echoed by PFC William Hubbard. "We came up on an 18-wheeler at a bridge. The driver started to back it up and I was only about two or three feet behind the truck. I just went forward and pushed him out of the way," said Hubbard.

"After that all the cars that were blocking the way proceeded to move out of the way," he added.

Actually, Hubbard said, "I was just trying to get out of there."

RAMP is not a universal remedy. Adoption of a RAMP-based training model, reinforced with mission-specific ROE, will not guarantee the optimal outcome in every situation. Some trigger-pullers will inevitably misread situations, freeze under pressure, or make errors in judgment. It is, however, an excellent means to improve the chance of favorable outcomes for U.S. forces. The sooner U.S. armored forces implement the RAMP model, the better for the soldier at the checkpoint.[16]

Notes

[1] Unless otherwise specified, masculine pronouns in this article should be read as referring to either gender.

[2] Sample ROE Card from JA 422 (Operational Law Handbook). Used by NATO ground forces in Operation CONSTANT GUARD.

[3] Fictional scenario based on information obtained from interview with 1LT Jim Pugh, 27 APR 98, at Fort Knox, Ky. 1LT Pugh served as a tank platoon and mortar platoon leader with 4-67 AR (Later 1-37 AR) in Bosnia from Feb 96 to Sep 96. The scenario does not describe actual actions taken by that unit.

[4] The following argument also applies to USMC armored forces. Throughout this article, "soldier" can also be read "marine."

[5] *FM 101-5-1.*

[6] Major Mark S. Martins, Rules of Engagement for Land Forces: A Matter of Training, Not Law-yering in *Military Law Review*, Vol. 143, 1994, pp 25-33. Major Martins, a onetime infantry officer, now a JAG officer, played a critical role in the development of the RAMP model, discussed later in this paper. Many of the arguments presented here are presented and further expounded in Maj. Martins' *Military Law Review* article. Further references to this article will be referred to as "Martins, *MLR*."

[7] Martins, *MLR*, p. 82.

[8] Martins, *MLR*, p. 55.

[9] *FM 100-23 (Peace Operations),* Chp 3 and App. D.

[10] Martins, *MLR*, p. 5-6.

[11] Martins, *MLR*, p. 86.

[12] METT-T is an acronym representing five factors that must be considered in the analysis of a tactical situation. These factors are: Mission, Enemy, Terrain, Troops, Time available.

[13] SPORTS is a mnemonic device representing the actions a rifleman immediately performs when his M-16 rifle does not fire. These actions are: Slap up on the magazine; Pull the charging handle to the rear; Observe the round in the chamber; Release the charging handle; Tap the forward assist; Squeeze the trigger. Performing SPORTS is a reflex action to a well-trained infantry soldier.

[14] *The Battle for Hunger Hill*, LTC Daniel P. Bolger, p. 99. The Hand SALUTE and VEWPRIK devices were developed by LTC Bolger and MAJ Martins, and were successfully used by soldiers of LTC Bolger's 1st Battalion, 327th Infantry Regiment at the Joint Readiness Training Center and on a peacekeeping deployment to Haiti.

[15] Martins, *MLR*, pp. 93-102.

[16] The author wishes to thank COL John E. Baker (SJA, Ft. Knox) and MAJ Mark Martins for their patient and helpful support; and MAJ (USMC) Scott Williams and CPT Joe Topinka for their proofreading assistance.

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Battle Command Insights

by Lieutenant Colonel James E. Zanol

Battle Command means action. It means accomplishing the mission at least cost to your troops in land operations — the tough, unforgiving arena that is land combat. It requires of battle commanders a lifetime of practice and study to prepare for those minutes, hours, days, or years of execution in actual operations. Actual battle is the great auditor of how well-prepared the battle commander really is. That arena is no place for amateurs.[1]

-GEN Frederick M. Franks

This paper is a collection of thoughts on what I've learned about battle command as one of the OPFOR motorized rifle regiment commanders. As the commander of 1st Squadron, 11th Armored Cavalry Regiment, I led the 125th Guards Tank Regiment during force-on-force battles at the National Training Center (NTC). In two years of command, I led the regiment through 11 rotations as the MRR commander, including the Advanced Warfighting Experiment, encompassing 24 regimental missions and over 30 MRB defense missions. Along the way, I have made observations that I believe are relevant to effective battle command and the orchestration of all battlefield operating systems. I have had the privilege to lead trained and motivated soldiers through repetitive, realistic, and challenging training. Only this kind of experience, which I enjoyed as an OPFOR commander, builds in a leader battle command skills. My experience has helped me develop and refine my ability to visualize the battle as a commander and increased my appreciation of the art of the possible.

Prior to my experience in the 11th Armored Cavalry, I could more readily discern potential difficulties associated with courses of action than I could identify the advantages gained through bold maneuver. Repetitive training, standard procedures, battle drills, and a clear, universally understood concept of the operation are what permits the NTC OPFOR to take advantage of fleeting, unpredictable battlefield opportunities. Identifying, de-

A successful OPFOR consolidates on the objective.

ciding to act on those opportunities, then leading, is the essence of battle command at the tactical level.

The purpose of this article is to share my observations on battle command. At the brigade and battalion level, battle command is inextricably linked to the effective integration of battlefield operating systems. In order to see himself, the enemy and terrain, identify possibilities, and issue orders to defeat the enemy, the commander must understand the systems at his disposal. This is done while always being mindful of his tactical purpose. Although, I've organized this article by battlefield operating systems, the emphasis must be on integrating those systems into a coherent concept of operation.

The OPFOR Regiment

The leadership and responsibility of the small unit leaders at the squad and platoon, the perfection of the training of these units must be given greater emphasis and less emphasis placed on the operation of the larger units such as battalion, regiment, and division. The division will succeed only as the platoon succeeds.[2]

-MG Ernest N. Harmon

The OPFOR regiment has a distinct way of fighting. When a new soldier, NCO, or officer joins the OPFOR regiment, he learns the SOPs, battle drills, TTPs, field craft, and, most importantly, the warrior ethos of the regiment. Battlefield skill is paramount. Excellence, aggressiveness, and success are expected. The effect is extremely powerful. Every soldier in the regiment shares a common understanding on how the unit fights, what actions must happen, what is possible given the mission, enemy, terrain, troops, and time available. That common understanding comes from monthly tough and challenging training on the NTC battlefield. The result is — as you would expect — trained, confident and aggressive soldiers, crews, platoons, and companies. Soldiers in the regiment know, understand, follow, and train to stable and tested SOPs. Trained soldiers and leaders, a stable SOP, commonly understood doctrine and tactics, and tough, challenging, repetitive training are the foundations for effective maneuver.

The end state is a unit capable of responding immediately to orders in a fluid environment. Our level of training permits leaders to focus on execution rather than the development of detailed plans and orders.

Battle Command

Battle command is the art of battle decision-making, leading, and motivating soldiers and their organizations into action to accomplish missions. It includes visualizing the current state and future states, formulating concepts of operations to get from one to the other, and doing so at least cost. It also includes assigning missions, prioritizing and allocating resources, selecting the critical time and place to act, and knowing how and when to make adjustments during the fight.[3]

FM 100-5

Leave it to Army doctrine writers to make such a passionless definition of the art of command, an otherwise extremely personal, cognitive, emotional, and professional act. Battle command is best described by terms like *coup d'oeil* or *fingerspitzengefuhl*. It is insight into the right action to take immediately and in the near future based on the commander's personal estimate of the situation. The estimate is based on the lifetime of practice and study as described by GEN Franks in the introduction. Extensive maneuver experience is the essential element of battle command. Commanders must have the ability to envision the development of the fight in time and space.

The commander's leadership style must create an environment conducive to effective battle command. The commander must remain calm and confident under pressure. A cool head leads to an accurate commander's estimate and coherent battle orders that are relevant to the situation. A calm demeanor is contagious and permits subordinates to focus on the mission.

Effective communications are equally important. The battle command radio "net" must stay clear and efficient, not cluttered with inaccurate, incomplete reports or over-detailed and specific instructions. Because subordinates understand the commander's concept of the operation, they can separate important information from potential distracters. When the battle commander sets and sustains sharp, succinct communications within his unit, command and control becomes a combat multiplier and is a key factor in allowing the unit to act faster than the enemy can respond.

Yet, effective communication will not remove the inherent uncertainty of battle. Commanders must accept risk and take decisive action. Bold action taken when you are uncertain will most often succeed because the enemy probably doesn't know what's happening either. Often, the commander must act when information is incomplete, the situation confused and uncertain. He must develop a personal tolerance to friction in order to maintain the mental energy and imagination to see tactical opportunities. Let the TAC and S3 fight while you think, make decisions, and issue orders. If you are controlling the movement of individual vehicles, you are not commanding your unit.

Know yourself. Every unit, leader, and soldier has strengths and weaknesses. Know your strengths. Every unit fights most effectively in a particular way. Use them in that way. Also, build a common understanding of how you fight throughout your force. Initiative, aggressiveness, tenacity are possible when every soldier in your unit knows how his actions contribute to the operation as a whole. Further, they each believe that the success of the operation hinges on their own personal or small unit actions. Know how to get every asset into the fight. Make a mental inventory of the assets available to you; special munitions, sorties, attack helicopters, and of course the maneuver units. As you are thinking ahead in time, review this list for assets you still have available. Often, one unit, type of munition, or asset is still available that you can use to drive home your attack, isolate enemy forces in depth, or create new opportunities for action. The TAC should do this, but the commander must think ahead in time and space.

Know your enemy. Consider the capabilities of your opponent's most effective systems and minimize their impact on your forces to protect your combat power. For example, to reduce the effectiveness of attack helicopters with stand-off weapons, use broken terrain that provides cover and concealment for your force. This will prevent the attack helicopters from getting sufficient time to track you and cause them to close within range of your air defense and direct-fire systems.

Consider the impact of weather as well as terrain. High winds can prevent helicopters from taking off. If these conditions exist, select a scheme of maneuver that otherwise might have been risky against attack helicopters. Finally, don't become predictable. Your opponent will learn your operating style and battle rhythm and find ways to minimize your strength and attack your vulnerabilities.

Seek a maneuver option. Isolate strength and attack weakness. If you can envelop your opponent, a deeper envelopment is always better and more effective. Remain flexible in your offensive and defensive plans so you can maneuver with your force to a position of advantage. Take risk. Most often the action that looks risky at first glance is really less risky than you think. Fix the enemy with a small part of your force, and maneuver the mass of your combat power to a position of advantage. Know what actions to take to turn a potential course of action from that of a gamble to one of acceptable risk. Most of the battles I fought without decisive results occurred when I chose a more conventional, safe maneuver option rather than one that was bold and unexpected.

Don't tip your hand. Retain the most flexible position with your force until you absolutely *must* make a decision. Allow more intelligence and combat information to come in and more situation development by units in contact. This is done by aggressive combat reconnaissance. Assume the enemy can see what you are doing unless you are absolutely sure he is blind. If you do conduct repositioning that sets your force in a position to execute one or two schemes of maneuver while eliminating a couple, look for indicators that the enemy saw your move. See if he has repositioned forces or failed to react to your deception measures. Do not, however, wait for "perfect information." Because the course of events will depend, in part, on enemy intentions, the commander, once he has considered the possibilities, must act boldly.

Deception can work. Keep deception plans simple and believable. Reinforce what the enemy is most likely to believe at the outset. In most cases at the tactical level, your deception efforts will get you only a few minutes of opportunity to exploit. Aim the majority of your deception efforts primarily at the individual, squad, and tank crew level. These men are the first to make contact with the enemy and the last to get the intel update or the satellite imagery. Fool them long enough to execute your plan and gain an advantage.

Above all, give credit for success to the fighting man. I have learned that all my battle command skill and expertise comes from the men who are in the fight. Their success, aggressiveness, and tactical skill create the opportunity for decisive action at my level. They, therefore, deserve to be led from the front by a leader who shares the pain of battle as well as the exhilaration of success.

Lessons of Maneuver

…adopting a scheme of maneuver that allows you the widest range of options, then keeping your forces balanced so any of those options are available to you.[4]

All operations must include decisive, bold maneuver. I achieved greater success when the maneuver was more aggressive, deeper into the enemy flank, and violently executed. Your plan and unit must have the flexibility and agility to execute a scheme of maneuver that hits enemy weakness. Always look for the weakness in the enemy, and then concentrate your combat power at that point. Units must maneuver to gain a position of advantage in order to place effective direct fire on the enemy. Use the terrain that provides you the best opportunity to hit the enemy from an unexpected angle. Maneuver along unlikely axes of advance and avoid expected approaches. "Slow-go" terrain is really "go" when the enemy is not there. Force the enemy to fight in an area not of his choosing.

Always have a concept of the operation that includes multiple schemes of maneuver. The option selected depends on the initial disposition of the enemy and your assessment of his intentions. This "course of action" decision is often not made until contact with the enemy is achieved and the enemy commits to his own course of action. Multiple courses of action allow your unit to exploit the enemy's weakness. Rehearse all courses of action and clearly understand the criteria that will help you decide which one to execute. Keep all of your maneuver options available until you absolutely must commit. Then commit with all assets available. If no weakness is seen, then maneuver to the *ground* that offers the best advantage to your force. The best example of this last point is the North Wall of the central corridor, or the Washboard area at the NTC. The OPFOR regiment can fight more effectively in this terrain than the units it faces.

Truly effective defensive concepts include a fully developed scheme of maneuver. A defending unit must maneuver in order to mass its combat power against the enemy's main effort. An attacking force will have to mass, reveal its scheme of maneuver, the main effort, point of penetration, and economy of force sector. When that happens, the defender likewise can use a small force on the nonthreatened flank and concentrate its combat power against the enemy. The repositioning defending forces do not go di-

"...All operations must include decisive bold maneuver..."

rectly to the point of penetration, but build depth in the engagement area to extend the depth and mass of concentrated direct fire and force the attacker to fight in two or more directions simultaneously. Repositioning forces must take up positions that, in addition to building depth, build mutually supporting crossing, direct fires. Units with stabilized weapons systems should be prepared to attack boldly into the enemy flank to exploit the shock effect of their initial volleys. Force the enemy to fight in at least two directions. Many units fighting at the NTC have experienced a kill sack built around repositioning T80, BMP, AT5, 2A45M, AT3, and small arms fire. The combined effect of massed and distributed fires is devastating. Remember that depth extends toward the enemy. A counterattack launched forward of the defense into the enemy's flank builds depth.

Light infantry units most often prepare defensive positions on the flanks of the battle positions, tying into terrain. Again, like the combat vehicles, if the infantry position is out of the fight, they must be prepared to remount and move to a position to contribute to the defense. Most defensive battles last long enough for this repositioning to occur in time for light infantry to rejoin the fight. Maneuver of dismounted infantry must always be a part of any plan and its branches or sequels.
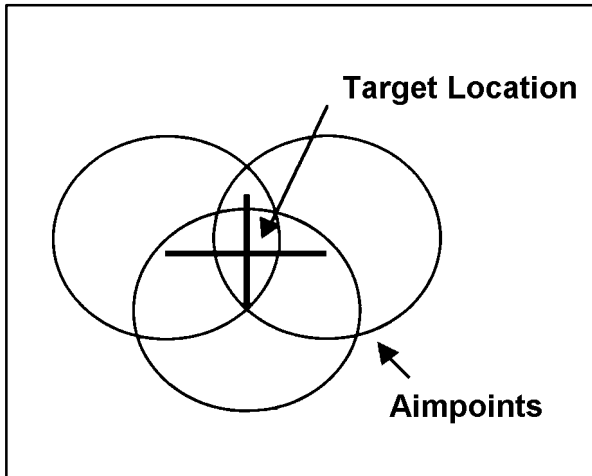
All systems in the unit must maneuver. Tanks and IFVs attack to seek a flank or advantageous position. However, artillery, air defense, engineers, IEW, reconnaissance, and logistics must also move to concentrate their effects on the enemy. Everything masses. The standing order for every element in any maneuver-oriented formation is to go find and attack the enemy. All combat and combat support leaders must understand the concept

of operation and take action to support the main effort. Do not sit on your objective or support by fire line if the enemy is not there and you are not contributing to the fight.

Lessons of Fires

Fires are effective when the concept of the operation and the scheme of maneuver are not described by the movement of units alone. Rather, fires and maneuver must be explained together in order to have a fully integrated concept. In addition, fires seem more effective when very top-driven. In the OPFOR, the concept of fires is developed to specifically support the scheme of maneuver of the regiment. The MRB commander gets little input into the scheme of fires. However, when the concept of fires is integrated into and strongly supports the regimental scheme of maneuver, the MRB commander will get the fires he needs, when he needs them, to accomplish his mission. The fires concept begins with the commander's guidance to ensure that fires and maneuver are mutually supporting. My criteria for fires is that the missions that get fired support the regimental scheme of maneuver, the main effort, that the target is massed, stationary, and in targetable terrain. If the call for fire does not meet these criteria, it probably will not be shot. The commander and FSO must really understand each other in the use of this criterion. The commander must clearly state where he wants the effects of fires. When the best massed, stationary target is not at the point of main effort, the commander may still want the suppressive effects of fire at that point to isolate enemy strength while maneuver forces attack weakness.

The concept of fires must be extremely simple and flexible. Having a small number of essential fire support tasks does this. This helps focus all of the fires

Target Location

Aimpoints

available to the unit on the most important part of the battlefield at the required time. Too many fire support tasks causes a smattering of fires all over the battlefield, rather than concentrated, massed effects at the decisive point. Someone in the formation will not get fires in his area. That is a fact. Commander's guidance must provide this focus. My guidance to my Armor lieutenant fire support officer included task and purpose for field artillery, CAS, and special munitions, generally by phase of fires or operation. This allowed him flexibility to maneuver field artillery assets as needed to support each phase and task to achieve the desired purpose. Commander's guidance and intent for fires should be very simple: fires are massed on large enemy formations on targetable terrain to support the maneuver of the regiment. Like the maneuver plan, fires must be flexible. Detailed targeting matrices based on an assumed, scripted-out enemy course of action are guaranteed not to survive contact with the enemy and often preclude effective integration of fire support into the overall concept.

Techniques of fire, however, add to the effectiveness, flexibility, and survivability of indirect fire assets. Understand the capabilities of the indirect fire weapons systems and use techniques of fire to increase their effectiveness. These techniques will also increase the effects of fires in support of the scheme of maneuver.

The multiple aimpoint technique of fire makes missions more effective. This technique uses three grid aimpoints to surround the target with fire, increasing the effects on the target. No matter how sophisticated targeting, ballistic computing, delivery systems, and smart munitions get, target location error will always be present. Using multiple aimpoints reduces the effect of target location error and maximizes the fire effects on the

target. The technique is very simple: each firing battery fires at a grid 50 meters from the target, the effects of all three batteries overlap at the target grid. This technique of fire exists in the AFTADS and BCS systems as a "BCS Special." The figure at left shows how this looks.

Volume of fire is another technique of fire that is critically important. Fires must be massed; battalions must fire at targets. Very often at the NTC, we see units fire inadequate volumes of fire, failing to achieve the effects desired by the commander. Massed fires used with multiple aimpoints are very effective. Most often units will fire a target with multiple aimpoints with only one platoon of the firing battery. At a minimum use a battalion to fire this mission, one battery firing at one aimpoint. This ensures that killing effects are placed on the target. This may seem an inefficient use of assets, using battalions instead of platoons. However, if the commander's guidance and targeting criteria is being strictly followed, then battalions should be fired.

Volley fire is another very powerful technique. Volley firing all assets available to your unit puts massive effects on the enemy simultaneously. Volley fire is especially effective against high-payoff targets. Then integration of reconnaissance, intelligence, and electronic warfare are vital in this connection. These assets can, over time, report on the location of command posts, attack helicopter assembly areas, UAV ground-based control nodes, artillery observers, or any other high-payoff target. The fire support officer builds this target list and simultaneously strikes these targets at the right time for greatest effect on the enemy. Volley fire also protects the artillery systems by overloading the enemy's target acquisition system with too many targets, slowing or completely shutting down his counter-fire system.

Offensive fires incorporate the principles described above: massed fires, at a massed target, on known, targetable terrain. Fire employed any other way diffuses its effect for the unit. The key for the battle commander is to monitor the current execution of fires while anticipating where fires must focus for the next action. Anticipation is key. For effective fire to be available at the right place and

in time, the commander must give the order, explain his intent and effects desired in time so that the staff can get to work. Also, with this lead time before execution, the XO and battle staff can orchestrate other combat power resources, CAS, EW, air defense, to further reinforce the maneuver action. Again, envisioning the development of the operation in time and space is vital.

Defensive fires are employed in much the same way with commander's guidance and target criteria. The subordinate units must provide the 10-digit, GPS grids to the target reference points in their defense. Additional TRPs — in deadspace, on avenues of approach, or at breach points — are also valuable. Unit observers can better call for fires when shifting from these known points. Very often, the enemy will unknowingly stop right next to a TRP. The TRP grids must be widely disseminated; the FSO must have them; all leaders down to TC level must post these TRPs on their maps. The MRB commander must ensure that he has an observation plan within his unit that covers all the TRPs. These known points dramatically increase the effectiveness of fires employed using the criteria described above.

Anticipating enemy action is slightly easier when you are defending. Once the enemy is fully committed and has revealed his concept, the commander again issues orders and intent for fire effects in order to mass effects in support of the defensive maneuver.

These techniques are not new or different. All exist in our doctrine. The fire support system must be very streamlined, flexible, focused on a small number of truly essential tasks, and closely monitored in execution. The desired effect is massed fires at the decisive point.

Lessons of Intelligence

The higher echelons are primarily concerned with the larger view; to them the problems that confront the battalion and the company are microscopic. But even when they do receive information of vital interest to the smaller front-line units, it seldom reaches those units in time to be of value.[5]

Intelligence, of course, plays an essential role in battle command. The commander must be able to see and understand the enemy. Only when you can see the enemy, understand how he intends to fight, can a proper decision be made on your scheme of maneuver. Anticipating

and planning for multiple enemy courses of action and layered reconnaissance are the key components of battlefield intelligence. The OPFOR *fights* the *enemy* as we see him; we do not rigidly expect a single enemy course of action. Developing multiple enemy COAs builds flexibility into our plans. Seeing the enemy, reconnaissance, is vital.

Layered reconnaissance is a powerful part of OPFOR tactics, and it makes a lot of sense. Every level of command in the OPFOR has reconnaissance. Divisional and regimental reconnaissance assets see the entire enemy force, providing the regimental commander the information he needs for the COA decision. The MRBs employ combat reconnaissance patrols, usually 45 minutes ahead of their main body, that answer their combat information requirements. Forward patrols are often used at the MRC level to see the enemy before making physical contact, and allow the MRC commander to develop the situation and maneuver to a position of advantage. Therefore, each level of command sees the enemy in time to make maneuver decisions, rather than blindly executing a specific plan. Each reconnaissance unit is a "connecting file" with the unit forward of it and is capable of developing the situation forward to effect battle handover. The OPFOR desert lore says "don't go anywhere for the first time."

Knowing how the enemy fights, as well as how you fight, helps you see patterns of operations. By understanding the effects of time, distance, terrain, and the doctrine and capabilities of your enemy, you can anticipate his actions. This knowledge reduces uncertainty and allows for more aggressive offensive action against him.

Scouting is the key to effective reconnaissance. Scouts and all other reconnaissance and intelligence collecting assets must position themselves on the battlefield and survive to give real-time information on the enemy. Scouts, GSR teams, engineer reconnaissance, and ADA scouts must all be expert in infiltration techniques to get into sector and to their assigned "sets."

Scouts must be expert in reconnaissance techniques: single vehicle infiltration, use of terrain, low illumination, waiting until late at night when vigilance is low, modifying routes based on intelligence already gathered. Basic tactical procedures such as PCI for no light sources, radio listening silence, reporting on a time schedule, secure communications, alternating patterns of operations, and reporting are all truly important to reconnaissance success.

Though this is heresy, I forbade my S2 from briefing NAIs and TAIs. We did not use a single situation template per se, but multiple enemy courses of action. We concentrated on what enemy actions we needed to see, rather than focusing recon assets on seemingly arbitrary pieces of terrain. The number and composition, location, direction of movement of every company team was what I needed to see. I limited the S2 to a very small number of reconnaissance objectives that answered my needs to make the scheme of maneuver and fires decision. The danger is that a commander will assume an enemy course of action and try to see too many things. For successful battle command, I learned to sharply focus all intelligence assets on the specific information I needed to make my decisions.

Radio Electronic Combat or IEW is an extremely powerful tool and is also integrated into the fight in accordance with the commander's concept of the operation. The work of collectors and jammers can contribute to the effectiveness of all operating systems. Maneuver is facilitated through deception traffic passed over both friendly and enemy radio nets that supports the actual course of action. Fires are enhanced through ICD measures that expose enemy forces to fire, and jamming that disrupts voice and digital fire support transmissions or air defense warning nets. Command and control is aided by collecting on the enemy jammers hitting friendly nets, and providing targetable data to our artillery to kill those jammers. Further, ICD keeps enemy jamming off of friendly nets by sustaining traffic on the net being jammed while the MRB jumps to its next clear frequency.

Deception works. Army doctrine is very good in that all the things you must do to make deception work are correct. The deception effort has to be integrated with the scheme of maneuver, a story for each scheme. The commander must dedicate resources to make the deception realistic. Expect that the deception effect will be brief and must be effective against crews, platoons, and companies.

Lessons of Air Defense

An aggressive posture ensures more effective air defense. When attacking, moving to positions that offer air defense protection expands and enhances the protection more than simply orienting on the friendly main body. Air IPB is critical in air attack tactics. Understanding the capabilities of the air platform, the method of employment, and the terrain that supports their employment identifies the sets for the SHORAD systems. As the main body advances, these teams must bound ahead to maintain their coverage. All-arms air defense means every direct fire system can kill aircraft. Because of the devastating effect attack helicopters can have, every weapon must engage when it encounters aircraft within its range. Very often attack helicopters will come too close to their target due to terrain, making them vulnerable. The OPFOR has repeatedly destroyed AH-64s with small arms, VIPER, and Dragon fire. The ADA commander must understand the commander's concept of the operations, track the battle, and take initiative to shift assets based on the situation.

Passive measures are critically important to any force, particularly when stationary. Dispersion and the use of terrain to enhance camouflage are mandatory when facing a sophisticated air threat. These hides, in addition to passive air defense, can also sell the deception story. Moving to several hide sites over time increases protection and will support the deception story. Maneuver can increase air attack effectiveness by using terrain that provides protection, and draws aviation, particularly attack helicopters, into the range of our air defense systems. Unit commanders and the ADA commander must conduct a joint air IPB in order to coordinate hides with ADA protection and positioning. This ensures mutual support from both units' capabilities, establishing proper air attack coverage. Additionally, this coordination can assist the air attack commander in developing his air defense engagement areas. Again, battle drills are vital. Units must be capable of moving dispersed, then rapidly concentrating in time for the close fight.

Mobility/Countermobility Lessons

Use of all time available is the most important battle command factor of this operating system. Unit commanders must never allow engineer assets to sit idle. SOPs, rapid planning, recon, decisions, and siting must happen in order to maximize engineer assets. The engineer effort must support the commander's concept of the operation so it is integrated into the scheme of fire and maneuver. Engineer commander status must be one of a peer commander with the maneuver unit commanders. His input on routes of march, situational obstacle emplacement, EA development, obstacle composition and siting is crucial. This is best done by

early integration in the planning process, and treating this commander as a peer.

Combat Service Support Lessons

Lessons of Combat Service Support are few and far between in the OPFOR. Generally, our logistics functions are not competitive during the rotation. Consequently, we have not learned the hard lessons of building and rebuilding combat power, casualty evacuation, rear area protection, and the myriad of other actions required to logistically sustain operations.

Lessons of Command and Control

Commander's intent is really only effective when the unit is trained, has effective SOPs and uses them, and has a common understanding on how the unit as a whole fights. The common understanding is really the key. This understanding and the empowerment of commander's intent comes with repetitive "combat" experiences. When facing a developing situation on the battlefield, a junior leader can only act within the commander's intent when he knows what his decision and actions mean to the regiment. He has an understanding of what is possible and can answer the "if-then" question; if I do this, then I can accomplish my task and purpose and meet the commander's intent. He can then confidently act within commander's intent and retain or seize the initiative.

Our doctrine for commander's intent is really very good. The intent statement in the order must be a very concise statement of purpose, method, and end state. It cannot include specific information by BOS more applicable to commander's planning guidance. Again, the foundation for making intent effective is a fully trained unit with a common understanding of how the unit fights. Then purpose, method, and end state becomes a useful expression of the commander's vision of the battle, how he sees it unfolding, and the effects he is trying to achieve.

Commander's intent must operate during the battle, not just in the planning stage. As the situation develops, the commander's estimate of the situation and actions required will change. The commander must inform his subordinates of changes to his intent during the fight *in time* for them to execute. Warning orders and FRAGOs are a good way to do this. This requires commanders to focus on their responsibilities: see the enemy, see yourself, and see the terrain. Clausewitz observed that war is a "continuous interaction of opposites." Think about what is

happening to the enemy, his action or inaction, what your force is doing, its combat power, and look ahead in time for actions to impose your will on the enemy. The commander must think at this level in order to see opportunities, issue FRAGOs that begin to set conditions for the next major action of his force, and then execute the FRAGO.

How the tactical operations center is organized and functions will determine how effective synchronization of all BOS will be. My gut feeling is that the current TOC/TAC organization in our doctrine really does not help synchronization. The brigade or battalion executive officer should be in charge of the TAC. With him is the FSCOORD, S2, S3 Air, ALO, MI CO/TM commander, ABE. They move to a position that provides effective communications and, if possible, a view of the battlefield. The executive officer controls the actions of all these players to synchronize battlefield effects. They are all face to face, using a common map to track friendly and enemy forces. The brigade or battalion commander and S3 are forward on the battlefield where they can see the critical points. The battle captains in all sections man the TOC. They battle track, work coordination issues identified by the TAC, maintain communications with higher headquarters, continue planning future operations, and prepare to pick up the battle if the TAC is destroyed or moving. The role of the commander, XO, and S3 support this arrangement. The commander is forward at the decisive point where he can make a relevant decision and executes with the help of the S3. The XO is at the TAC monitoring the whole zone and orchestrating all of the units' combat systems, integrating them under the commander's concept.

This organization of the TAC makes synchronization happen. Leaving the XO in the TOC to battle track and conduct the "deep battle" is ineffective. He and the battle staff must coordinate battlefield activities to support the integrated close and "deep" battle. The best place to do that is forward where they can see and talk.

Crosstalk among subordinate commanders is an extremely powerful battlefield action. To encourage your commanders to crosstalk on your net, you must discipline yourself to be quiet. Issue your orders, convey your intent, then monitor and talk only when necessary. That way the men in contact with the enemy, who know what is possible, can talk to each other to the benefit of the

whole unit. The leader in contact with the enemy must be encouraged to make a recommendation on the course of action. Commanders who direct the movements of individual vehicles crush initiative and the willingness of commanders to crosstalk.

The commander's role, as alluded to above, is to command a lot and control just enough. He must be forward where he can see the action, to make his judgment as to what is possible. Monitor the current execution while thinking ahead in time for the next action you want to take. You can't do this if you are directing B22 into a firing position. Therefore, learn how to position yourself forward to see, survive, and command. The old maxims here are generally true. Move with a unit so it can provide you security. When you go to a position, know where the closest tank or IFV is that offers you protection. Stay away from prominent, targetable terrain, get just high enough. A single vehicle in a good set in the flats is more survivable than sitting on top of a hill. Reposition often to stay with the action and to avoid being targeted. Above all, be forward, far forward where your main effort is fighting, where you can make immediate assessments and issue orders to take advantage of fleeting windows of opportunity.

Summary

We have identified danger, physical exertion, intelligence, and friction as the elements that coalesce to form the atmosphere of war, and turn it into a medium that impedes activity. In their restrictive effects, they can be grouped into a single concept of general friction. Is there any lubricant that will reduce this abrasion? Only one, and a commander and his army will not always have it readily available: combat experience.[6]

These comments are provided for what they are worth. I was fortunate enough to command at the NTC for two years, enjoying the chance to lead or participate in tactical operations conducted in the most realistic training environment available every month. Experience is the best teacher, the most efficient lubricant to overcome the friction of war, as noted by Clausewitz. The NTC is a simulation and one could question the value of my experience on those grounds. However, the Army is training more and more through

WAITING FOR THE METEOR
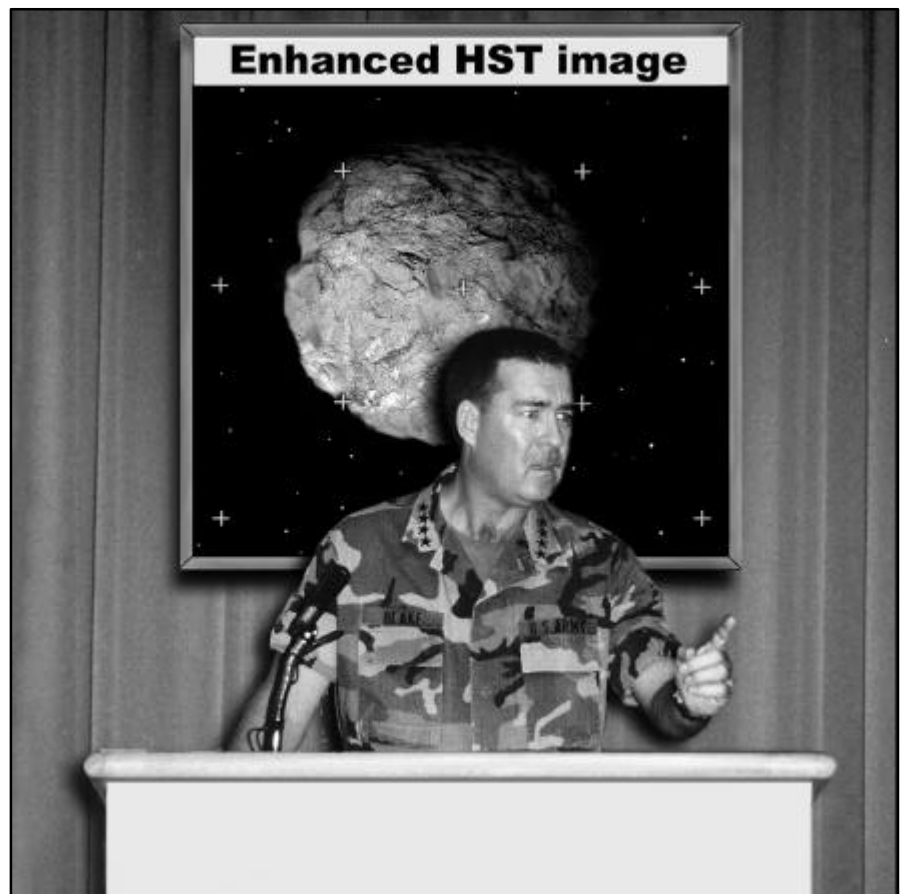
Thoughts on Personal Leadership

by Lieutenant Colonel Kevin C.M. Benson

"It is probably the right time for a little reflection on just what it is we are supposed to do for the American republic."

Enhanced HST image

A recent *Atlanta Journal Constitution* article concerned a Harvard University astronomer's sighting of a mile-wide meteor projected to pass near the Earth in the year 2028. Asked to speculate on the nation's reaction if it was likely to hit the Earth, he said, "A space mission would have to go out to it and find some way to deflect it. The *military types* would come in and do their thing." (emphasis added).[1] On the same day, the same newspaper ran another article, on how Atlanta-based Third U.S. Army troopers were doing in the Persian Gulf. Asked about how our troops spend their days of 12-hour shifts and constant vigilance, SPC Mark Gunnell said, "No one knows for sure how long the tour will last. We thwarted a war, and we're all proud of what we did."[2]

These vignettes, strangely enough in the same paper on the same day, reflect the American attitude toward the military. We are living in an age of wonder and danger, and very few of our fellow Americans know what it is we soldiers do. In a democracy, that is probably a good thing. The people do not know about us until we are needed, and then expect us "military types" to come in and do our thing, whatever that thing is or whatever it requires of us. They don't ask, "Are they ready?" or "How many days will they need to get ready?" The Harvard astronomer had it right on the nose: we will be expected to come in and do our thing.

In the midst of the confusion over Force XXI, Army After Next, 45 tanks in a battalion with no CSS, a half-full glass, OPMS XXI, and the new OER, it is probably the right time for a little reflection on just what it is we are supposed to do for the American republic. This is at the heart of success for our Army and, indeed, for our brothers and sisters in the Navy, Air Force, and Marine Corps as well.

Think of the high standard that Harvard astronomer just set for all of us in uniform! Talk about take a message to Garcia! He expects that soldiers, sailors, airmen, and marines would go out on a mission, determine what needed to be done, and do it. This is what our fellow Americans expect of us. Indeed, in the absence of personal knowledge, our fellow Americans probably think that all we do is get ready to do impossible tasks to standard. When the bugle sounds or when the meteor's impact is imminent, the American people expect us to be ready to

go into the breach. The people will not care at all for our consideration of others, how we manage diversity, or if we use polite speech; they will expect us to be ready. At that awful moment, we must be tough, trained, hardened, united, and ready to sell our lives dearly if that is what is required. This ought to make us all really proud of what we do, and it also ought to make us really think.

What we do is get ready for war, or fight wars. Wars are now rather more loosely defined, as I'll bet the 2d Cavalry Regiment in Bosnia or the 2d Brigade of the 3d Infantry Division in Kuwait would second. Let us say then that what we do is go places, ready to fight if needed, when the American people want us to. In getting ready for war, and fighting war, we must set conditions for success. Call that what you will — consideration of others, managing diversity, etc. — but one of the conditions required of us as soldiers is the ability to deal with people.

There are many points of view about dealing with people, both civilians and the soldiers who make up our Army. It is chic now to speak in terms of managing diversity and showing consideration for others' points of view. Fehrenbach reminds us, though, that on the battlefield, the sergeant's word must be obeyed as if it came from a four-star general.[3] Discipline is not a four-letter word. It is not negative. Discipline is the soul of the force; it shows we all look out for each other, even in the absence of orders. This does not require special consideration of others, it requires what our Army should solely call personal leadership.

American military history is replete with examples of this form of leadership. In that awful, shrieking moment when death is staring men in the face and panic means dishonor, leadership — personal leadership — stands to the fore. The "Lost Battalion" of World War I is a prime example. The battalion was a part of the American offensive in Saint Mihiel, in 1918. Ernest Hemingway cited this action in *Men at War,* "All through October 6, the battalion held its position. Commanders and commanded were discovering the secret of the siege — that the human capacity for endurance exceeds all belief, as long as there is a leader to say, 'Don't give up, we're not licked yet.' And this battalion had such a leader, a man who held his men steady by his own unshaken presence."[4] This man

was MAJ Charles Whittlesey, the battalion commander.

Another great leader of Armor and Cavalry, GEN (then MAJ) G.S. Patton, Jr., also had a flair for personal leadership. In an essay written for the *Cavalry Association Journal,* he wrote, "Our means of studying war have increased as much as have our tools for waging it, but it is an open question whether this increase in our means has not perhaps obscured or obliterated one essential detail; namely the necessity for personal leadership."[5] This essay sounds as if it was discussing what we face today. We are on the verge of developing means of greater situational awareness on and off the battlefield. War may not ever again be a circle of serious soldiers around a map; it is more likely that we will be huddled around a liquid crystal display screen or a large screen, high-definition television. Patton wrote of this, reminding his peers then that war is an intensely personal thing, indeed it must be, because we still require our soldiers to go out and face death and cause death. This requirement, so horrible that we do not talk about it in the crush of meeting the requirements of training, demands that there be personal leadership at all levels.

In his master work, *Citizen Soldiers,* Stephen E. Ambrose wrote of 1LT Lyle Bouck, "Lt. Lyle Bouck commanded the intelligence and reconnaissance (I&R) platoon of the 394th Regiment, 99th Division. He was commissioned as a second lieutenant at age 18. Informal in manner, he was sharp, incisive, determined, a leader."[6] In a roaring moment of decision, this 18-year-old platoon leader changed the course of the Battle of the Bulge. Short of Elsenborn Ridge is a little crossroad village called Lanzerath. At this cross road, the I&R platoon under the leadership of 1LT Bouck held up the advance of the lead elements of the entire Fifth Panzer Army for 18 hours. Every member of the platoon was wounded, but they held their ground and accomplished their mission. Then as now, scouts are required to find the enemy and report, but in this instance, the platoon had to fight. 1LT Bouck held his men at their posts in one incident which helped turn the tide of battle and gave us a real example of personal leadership.

Personal leadership requires all of us who call ourselves leaders to get away from the computer screens and know the

men and women we have the honor to lead. We must do this despite the pressure of other requirements generated by well-meaning staffs at PERSCOM, Department of the Army, and the Defense Department. Our friends at these levels do their best for the rest of the force. The demand of personal leadership, though, is to know when to say no to these well-meaning requirements, or ignore them when faced with the requirement of preparing for war. Truly, anything we do in the Army can and is justified in the name of assisting readiness. The measure of the leader is to know just what is important when. This ability must be developed in peacetime because it is far too late, and can lead to great tragedies, in war. Ambrose points this out in *Citizen Soldiers.*

The pressure for constant advancing of the front lines was remarkable in the European Theater of Operations. Ambrose writes, "SHAEF put the pressure on Twelfth Army Group; Bradley passed it on to First, Third, and Ninth Armies; Hodges, Patton, and Simpson told their corps commander to get results; by the time the pressure reached the battalion COs, it was intense. The trouble with all this pressure was that the senior officers and their staffs didn't know what they were ordering the rifle companies to do. They had neither seen the terrain nor the enemy. They did their work from maps and over radios and telephones... When the chase across France was on, senior commanders (although seldom their staffs) were often at the front, urging the men forward. But when the line became stationary, headquarters personnel from battalion on up to corps and army found themselves good billets and seldom strayed. Of course there were notable exceptions, but in general, the American officers handing down the orders to attack and assigning the objective had no idea what it was like at the front."[7] The great danger of ignoring the requirements for personal leadership rapidly become a form of hubris, the feeling that all the accomplishment of a mission needs is the right kind of push from an unattached, dispassionate point of view.

What kind of leader can live the requirement of personal leadership? Col. Michael D. Wyly, USMC (Ret.), writes of two theories of war, Technological Superiority Theory and Mental Agility Theory. Technological Superiority The-

> *"Those old enough to remember the backlash against MacNamarian management recall the slogan, "No one can be managed up a hill; you lead men up the hill." It is time to recall those days. We lead by example, a truism since Caesar."*

ory's essence is that secure digital communications, information dominance, brilliant munitions, and long-range weapons will deter any foe less sophisticated than our forces. Mental Agility Theory's essence is that any system or system of systems can be overcome by a determined enemy.[8]

Wyly writes that the leaders of the force that defends American culture, the wars of the future, must possess that mental agility to understand that American soldiers defend American culture, and also understand the people among whom they fight. The enemy will immerse himself in the local populace, thus we must also either win the sympathy of the local people or neutralize their support of the enemy. Of course all of this must be done under the glare of the intrusive eye of the media, because that is also what sustains the support of the American people.[9]

The leaders of the 21st century Army must be able to use the technological systems to determine the decisive point, use the systems as an electronic Napoleonic hill, then go to the point on the ground, sharing the danger with his troopers and refining his understanding of the war his men are fighting and which must be won. Truly, the path of virtue lies between the extremes of the leader who disdains his headquarters and the "chateau" leader who remains at his electronic vantage point without going forward at all. Finding this path of virtue will require all of us to constantly study warfare; it is a life work. The demand of personal leadership is one which requires all of us to remain prepared for war our entire careers, and whether the war comes as a junior officer or as a senior officer on the day of retirement, we must be ready to fight and lead. This duty is a harsh taskmaster.

I return then to the original thought of personal leadership. We confuse ourselves in an already confusing time by allowing ourselves to follow the dictates of the times calling personal leadership by other names, like "consideration of others," or "managing diversity." Those old enough to remember the backlash against MacNamarian management recall the slogan, "No one can be managed up a hill; you lead men up the hill." It is time

to recall those days. We lead by example, a truism since Caesar. Leaders of the 21st century, as those of the preceding centuries, must use personal leadership and all it demands. We must know our systems and our troopers. We must deeply give a damn about our troopers and treat them like adults. We must also know that sometimes this requires us to use impolite speech to get the attention of those who do not respond to adult treatment. Using trite phrases confuses the issue. Do we lead, or do we have rap sessions and then hold hands and sing "Kumbaya?" Clearly, we lead, and leadership is and always will be a personal interaction with those we want to lead, namely our troopers.

The American people, because they do not understand what we do, nor really want to, I suspect, set high standards for those of us in uniform. We have the privilege of bearing arms in the defense of the Republic. When the Republic calls, we must be ready to fight in that instant. Any less is failure, any less could lead to the defeat of the Republic. As the Harvard astronomer said, "The military types come in and do their thing."

The defense of the Republic demands straightforward terms and an understanding of our history as an Army and as a Republic. We are soldiers; let us use a soldier's terms and call leadership what it is, leadership. The requirements of leadership are timeless: technical and tactical competence, and knowing the men and women, like the SPC Mark Gunnels of the force, we have the honor of leading and serving. Change is a constant, but in times of change, there is the need for a fixed point, something on which to focus. Leadership is the constant, and personal leadership is required of all of us.

The wars we will face at the dawn of the 21st century will not be high tech and clean. Our dominance in those realms will make our opponents, who deeply hate us and our American culture, fight us in different ways. The leaders of the 21st century must be able to convince the policymakers that wars cannot be quick and clean. These leaders will also have to keep the Republic out of the globe-spanning techno-conflicts which could destroy it. The leaders' path of virtue will

require understanding the technological systems, using them in the best possible manner, while remaining in touch with the troopers doing the fighting. The unchanging requirement of leaders from any age remains, personal leadership and sharing the danger with the soldiers. Our Harvard astronomer placed quite a burden on us "military types" when he said we would "come in and do our thing." We must be willing and able to meet this challenge. Think about it; are you willing?

Notes

[1]*Atlanta Journal Constitution,* p. A-1, 12 March 1998. Hereafter cited as *AJC.*

[2]*AJC*, p. B-2.

[3]T.R. Fehrenbach, *This Kind of War, A Study in Unpreparedness,* New York: Bantam Books, 1991, p. 415.

[4]Ernest Hemingway, ed., *Men at War,* New York: Bramhall House, 1979, p. 735.

[5]G.S. Patton, Jr., "Success in War," as cited in the *Cavalry and Armor Heritage Series, Vol. 1, Leadership,* Ft. Knox, Ky., U.S. Armor Association, 1986, p. 53.

[6]Stephen E. Ambrose, *Citizen Soldiers,* New York: Simon & Schuster, 1997, p. 192. The I&R platoon received a Presidential Unit Citation, four DSCs, five Silver Stars, and ten Bronze Stars for Valor.

[7]Ambrose, p. 166.

[8]Michael D. Wyly, "Combat in the 21st Century," *U.S. New & World Report,* 16 March 1998, p. 1, e-mail version.

[9]Wyly, p. 4.

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The Brigade Reconnaissance Troop

Profiling a New Kind of Unit

by Captain Thomas M. Feltey

Brigade Scouts? The answer to this for many years was simply task force scouts performing reconnaissance and security for the brigade commander, leaving the task force commander with limited recon and security capabilities. Well, thanks to one of the many Force XXI initiatives, brigade scouts now exist in the form of the Brigade Reconnaissance Troop (BRT). The first BRT was activated on 15 May 1996 at Fort Hood, Texas, as part of the 1st Brigade, 4th Infantry Division, and participated in the year-long Advanced Warfighter Experiment (AWE). The purpose of this article is to introduce the armored force at large to the BRT's missions, organization, capabilities and limitations. It will also share tactics, techniques, and procedures developed during the year-long Advanced Warfighter Experiment, and discuss the future direction of the BRT.

The fundamental role of the BRT is to perform reconnaissance/surveillance and provide security for the brigade in close and deep operations. The digitized BRT consists of four officers (12C) and 81 enlisted soldiers. It is organized into a headquarters platoon and two scout platoons. The BRT's primary mission is to provide battlefield information directly to the brigade commander. The brigade commander and his staff determine the role of the BRT in all brigade missions and, by virtue of their digitized capabilities, provide the brigade commander near-real-time information regarding the enemy's disposition and direction of movement. The troop can man up to eight long-duration observation positions (OPs) and 16 short-duration OPs. The troop's frontage is typically 6-10 kilometers, but the troop is capable of up to 15-20 kilometers in a desert environment.

The Headquarters Platoon. The headquarters platoon is organized and equipped to perform command and control and logistical support functions for the troop. The platoon consists of the commander, executive officer, first sergeant, supply sergeant, motor sergeant, mess sergeant, communications sergeant and 16 enlisted soldiers. The platoon's major features include the HMMWV-mounted TOC, a 1,000-gallon tank and pump unit, a mess section, and a maintenance/recovery section with a 1¼-ton wrecker. The maintenance and commu-

nications sections are organized and equipped to diagnose and repair most equipment faults at the troop level.

The Scout Platoons. The BRT scout platoons are organized and equipped to conduct reconnaissance and security operations in support of the parent troop. The platoon consists of the platoon leader, platoon sergeant, and 29 scouts. It is equipped with nine HMMWVs (four with Mk-19 and five with the M2 .50 Cal.) of which one HMMWV is a long-range surveillance system, either the Hunter Sensor Surrogate Suite (HS3) or the Long-Range Advanced Scout Surveillance System (LRAS3). Although not organic, the scout platoons usually operate with an attached COLT, an engineer recon squad, an MI ground-based sensor (GBS) squad, and a medic. The platoons can organize into various configurations, but normally operate with three sections of two HMMWVs (A, B, and C sections) each, a surveillance section with the LRAS3/HS3, and the platoon sergeant, leaving the platoon leader freedom to maneuver. The vehicles of the platoon leader, platoon sergeant, and A and B sections are manned with three scouts each, including the leaders. Charlie section's vehicles are manned with four scouts each and are normally utilized for any specified dismounted missions. The LRAS3/HS3 is manned with four scouts who are trained to operate their specific systems. These platoons are essentially TF scout platoons (-) and behave similarly, with a few exceptions in command and control as well as positioning on the battlefield.

Force XXI Special Equipment

The bedrock of Force XXI lies in the Applique Information System. Every platform in the BRT had applique systems installed during the AWE. The applique is a suite of computing hardware, an installation kit, system software, applications software, and integrated logistics support. The system provides situational awareness and command and control at all echelons. The applique software provides a point-and-click-type menu, similar to Microsoft's Windows environment for operating the applique. The applique supports battle command tactical mission requirements, including:

- Real-time situational awareness for the commander, staff, and soldiers.
- A shared, common picture of the battlefield.
- Graphic displays.
- Friendly and enemy unit locations (enemy unit locations are based on reports).
- Target identification.
- Integrated logistics support.
- Communications-electronic interfaces with host platforms.

Applique enhances battle command by providing a seamless command and control capability through interfaces with other Army C2 systems (ABCS). This allows the user to send or receive C2 information and situational awareness data across and within the battlefield, irrespective of the task organization. Its ability to interface with and use SINCGARS (SIP), EPLRS VHSIC, SDR, and the MSE TPN communications systems results in vertical and horizontal integration of the battlefield. The end result of all these systems is the tactical internet. The tactical internet's main benefit is situational awareness (SA). To Force XXI, SA is defined as sending and receiving individual platform locations and having them graphically displayed on the applique system. These blue icons reflect the real time locations on the battlefield and are continuously updated. Situational awareness for the enemy is based on SPOT reports. When a user clicks on a red icon, the size and type of the unit are listed, as well as the observer and time reported. As time elapses, the icon begins to fade to represent an older report. Generally these reports were digitized at the battalion and brigade level to avoid erroneous reports.

The standard background displayed on the applique monitor is a 1:50,000 map of the current area of operation. Other size maps are available, including satellite imagery. Each platform's location is correctly positioned on the map. Graphics are also present, which are generated at all levels, and can be disseminated digitally from one vehicle to any number of platforms.

The final application of applique is command and control, defined as the ability to digitally send and receive pre-

formatted reports and operations orders as well as free-text messages. Applique possesses numerous formats, to include SPOT reports, contact reports, call for fire formats, OPORDS, FRAGOS, and NBC 1 reports. These formats are either type-in-the-blank or scroll-down windows and are generally user-friendly.

The Dismounted Soldier System Unit (DSSU). Each squad in the BRT was equipped with the DSSU. It is essentially a man-portable applique system that utilizes the same software and is a part of the tactical internet. The DSSU weighs about 20 lbs. and is composed of a notebook-sized, militarized computer with a heads up display that is mounted on the soldier's helmet. The DSSU is linked to the tactical internet by a hand-held SINC-GARS (SIP), which is very similar to the old PRC-126, and a GPS. These items are attached to the rucksack and are powered by a number of lithium batteries. The DSSU possesses the same capabilities as the applique and provides the platoon leader with exceptional situational awareness as to the location of his dismounts. Likewise, the dismount possesses unparalleled situational awareness of the entire BCT which allows them to move faster and safer than ever before. Limitations of this system include the obvious additional weight the soldier must carry, the number of batteries necessary to sustain continuous operations, and the overall fragility of the system.

Surveillance Systems. Each platoon is augmented with a special surveillance system, either the Long Range Advanced Scout Surveillance System (LRAS3) or the Hunter Sensor Suite Surrogate (HS3). These systems have the ability to identify and provide an accurate location of targets between 10 and 15 kilometers.

The LRAS3 is a lightweight, extended range, line-of-sight reconnaissance and surveillance system. The LRAS3 provides all-weather, day and night real-time target acquisition and target detection. The LRAS3 is employed on a HMMWV and consists of a second-generation FLIR, MELIOS laser rangefinder with compass/vertical angle measurement, GPS interface, and a low-light television camera. The LRAS3 is capable of remaining ready to use during mounted cross-country movement. Once an enemy target is located, the data is entered into the applique and transmitted to the troop TOC that disseminates it throughout the brigade. This system will also be capable of dismounted use away from the vehicle. During the AWE, this vehicle operated with the 2nd platoon leader and was mounted with a .50 cal MG.

The HS3 consists of an M1026A1 HMMWV with a sensor package consisting of a second-generation FLIR, two day cameras, and a MELIOS with GPS interface, all mounted on a hydraulically operated 10-foot mast. The vehicle provides the troop with long-range target acquisition and the ability to transmit target range, position, and still imagery to the troop TOC or other designated stations. This system can digitally compress and send digital still imagery using phototelesis software. This sensor package cannot be dismounted from the vehicle. During the AWE, the HS3 operated with the 1st platoon sergeant and was not mounted with any external weapon system.

The Reconnaissance

The BRT conducts reconnaissance for the brigade commander in order to confirm or deny enemy disposition. The brigade S3 and S2 provide the recon objective based on the commander's guidance, SITEMP, and projected friendly course of action. The BRT also aids in the brigade's deep fight through target acquisition. The BRT issues its order following the brigade's "choosing a course of action." Stealth is the primary method the BRT utilizes in recon operations. A stealthy recon is the most time-consuming method that emphasizes avoiding detection and engagement by the enemy. The BRT does this by exploiting the technical advantages of the brigade's robust reconnaissance, intelligence, surveillance, targeting and acquisition (RISTA) capabilities. Prior to the start of the recon, the BRT commander and his platoon leaders gather in the brigade MAIN and collect real-time enemy information from JSTARS and UAV downlinks. This information allows each platoon leader to infiltrate his platoon through the enemy security zone to assigned NAIs. The enemy information is sent to each BRT platform for the vehicle commander to utilize.

Prior to LD, each platoon's long-range surveillance system is positioned to overwatch the LD for security. Each section uses its own infiltration routes and enters the zone using the shuttle method. During certain missions, a squad or an entire platoon may infiltrate by means of an air insertion. The rest of the recon is similar to that of the TF scout platoon. However, TF scout platoons benefit from the BRT's initial reconnaissance. The BRT essentially pulls the TF scout platoon into the zone through FM communication with the TOC or digital communications. As with TF scouts, the BRT's ability to penetrate or fight for reconnais-

sance is limited. In order to assist the troop, the brigade commander may slice a heavy combat force to assist the BRT scout's reconnaissance, at least through the enemy's most forward security elements.

Other assets the BRT scout platoons utilize are the OH-58D and the UAV. When the situation is vague, the troop commander requests, through the brigade, the use of the UAV. The UAV is then directed by the troop TOC to overfly the scout platoon's infiltration routes. This is a great technique that helps prevent scout casualties. The other asset is the OH-58D, which provides critical information to the brigade, as well as overwatching the scout platoon's movement. Since the OH-58D possesses target designation and direct-fire capabilities, the helicopter works extremely well in protecting scouts forward of the LD/LC. As both of these assets identify enemy vehicles, the brigade S2 enters the enemy into the applique, and immediately the entire BCT is aware of the SPOT report.

During the recon, the TOC operates on the troop command, brigade O & I, and brigade command nets. The troop TOC is manned by the XO and is positioned as the critical link between the troop and the brigade main. The troop commander operates on the troop and brigade command nets and is positioned apart from the troop TOC and functions as the critical link between the scout platoons and the troop TOC. The BRT scout platoon leaders are tasked to ensure effective communication is maintained with their scout platoons and either the commander or the TOC.

Habitual attachments travel with the scout platoon to accomplish their missions for brigade. These attachments include two engineer recon squads, two COLTS, and MI GBS teams. A maximum of three vehicles travel together at one time to prevent revealing a large signature entering the zone. The scout platoons also have a medic who rides with one of their vehicles.

Sometimes, when the situation dictates, only one scout platoon conducts the reconnaissance while the other rests and conducts troop-leading procedures for the next mission. This technique allows the BRT to sustain continuous operations. In this case, the scout platoon leader staying behind co-locates with the brigade planner to facilitate parallel planning. At culmination of the previous mission, the second platoon deploys immediately as the other platoon retrogrades.

You Asked, We Listened:
A Software Tool for Predicting Live-Fire Scores from Device-Based Scores

by Dr. Joseph D. Hagman

Back in the 1996 November-December issue of *ARMOR*,[1] Dr. John Morrison and I proposed a strategy that would permit Army National Guard (ARNG) armor unit trainers to complete the device-based portion of their tank gunnery training program in just three Inactive Duty Training (IDT) weekends and afterwards be able to predict which of their crews would be first-run qualifiers on Tank Table VIII (TTVIII). What made this strategy tick was a table that predicted TTVIII gunnery scores on the basis of gunnery scores fired on the Conduct-of-Fire Trainer (COFT).

Since appearance of this article, we've received telephone calls and e-mail messages from ARNG armor unit trainers wanting to know if they could develop their own prediction tables that would extend to other devices (e.g., the Armor Full-Crew Interactive Simulation Trainer [AFIST]) and perhaps better apply to their specific TTVIII range(s). Not only is the answer to this question yes, but the U.S. Army Research Institute's field office in Boise, Idaho, has gone ahead and developed a software tool to support this desired capability.

The Tool

The tool is a floppy-disc-based software program designed to run in a Windows 3.1 or 95 environment. It can calculate predictions for any live-fire evaluation exercise (e.g., TTVIII) that is simulated on a training device (e.g., COFT, AFIST), provided the same scoring procedure is applied to each. You enter the device and live-fire scores and, with the click of a button, the tool automatically performs the statistical analyses needed for calculating the predictions and then saves the results of your work.

How Does It Work

The steps you will need to take to create, view, interpret, and use the tool's predic-
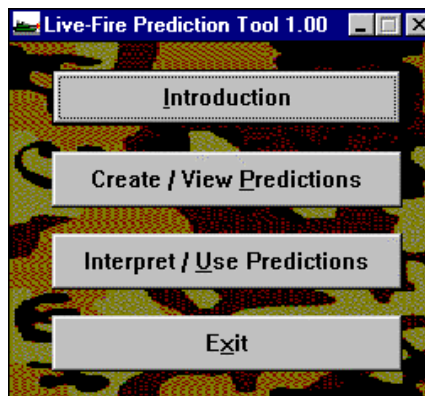

Figure 1. The Prediction Tool main menu

tions are listed under the main menu options shown in Figure 1. You simply click on the desired option to enter, or obtain, the information requested. It's that easy.

Clicking on the "Introduction" button provides you with (a) guidance on what kind of device and live-fire data will need to be collected and then entered, (b) tips on how these data should be collected for best results, and (c) helpful hints on how to navigate successfully through the program.

Clicking on the "Create/View" button will lead you to the "Prediction Log" screen, shown in Figure 2, where the results of your work will eventually be stored for permanent access.

Clicking on the "Prediction Log" screen's "Enter New Data takes you to the "Enter Scores" screen, shown in Figure 3, where the device and live-fire data collected earlier are to be entered, along with information needed to identify your data set. This information includes the category of live-fire to be predicted (e.g., tank gunnery), the specific live-fire exercise scores to be predicted (e.g., TTVIII), the training device to be used for prediction (e.g., COFT), the specific device exercise scores from which predictions will be based (e.g., advanced matrix exercise 131), the cutoff score(s) against which predictions will be calculated (e.g., the minimum TTVIII qualification score of 700), the maximum possible live-fire score (e.g., 1,000 on TTVIII), and specific unit/range information.

Once you've entered the requested information, clicking on the "View Predictions" button sets the program into action and presents you with the resulting predictions. They will be displayed in table

Figure 2. The Prediction Log Screen

Figure 3. The Enter Scores Screen.

format like that shown in Figure 4. Column 1 will contain a specific range of device scores. Column 2 will show the predicted average live-fire score for each device score listed. Column 3 will show the predicted first-run chances of firing at or above the live-fire cutoff score that you entered earlier (e.g., 700). Lastly, clicking on the main menu's "Interpret/Use Predictions" button will provide you with guidance on how to do just that for the predictions provided. Using the sample prediction table shown in Figure 4, for instance, it would be predicted that a tank crew with a COFT score of 763 will on the average fire 700 on TTVIII and have a 50% chance of successful first-run qualification. A tank crew with a COFT score of 856 will on the average fire 764 and have a 70% chance of successful first-run qualification, and so forth.

What's the Payoff

The obtained predictions will allow you to do things now that you haven't been able to do before. For starters, you will be able to predict tank crew, first-run, live-fire performance *on your range* based on performance obtained *on your device(s)*. Second, you will be able to schedule device-based training more efficiently by targeting only those crews in need of remediation (i.e., those not meeting the device-based live-fire expectancy standard [e.g., 70% probability of first-run qualification] set by the unit commander). Third, you will know when your crews have received enough device-based training (i.e., when they have met this expectancy standard). And lastly, you will save ammunition by allowing only those crews ready for successful live-fire evaluation to proceed to the range.

Although the prediction tool software program was developed for use by ARNG armor unit trainers to predict the live-fire tank gunnery performance of their tank crews, it's theoretically possible that Active Component (AC) armor unit trainers can benefit from the program's use as well. I say theoretically because we haven't conducted the preliminary research required to assess the validity of its predictions for AC crews. Despite the need for this research, it might be worthwhile to try the program out to see if its predictions also apply to the AC environment. We'd be interested in hearing about the results.

If you have additional questions or comments about the prediction tool software program, or if you would like a copy, contact Dr. Joseph D. Hagman, U.S. Army Research Institute, Reserve Component Training Research Unit, 1910 University Drive, Boise, ID 83725; commercial 208-334-9390; fax 208-334-9394; e-mail address: hagman@ari.army.mil

Notes

[1]Hagman, J. D. & Morrison, J. E., "Research pays off for the Guard: A device-based strategy *ARMOR*, November-December 1996, pp. 48-50.
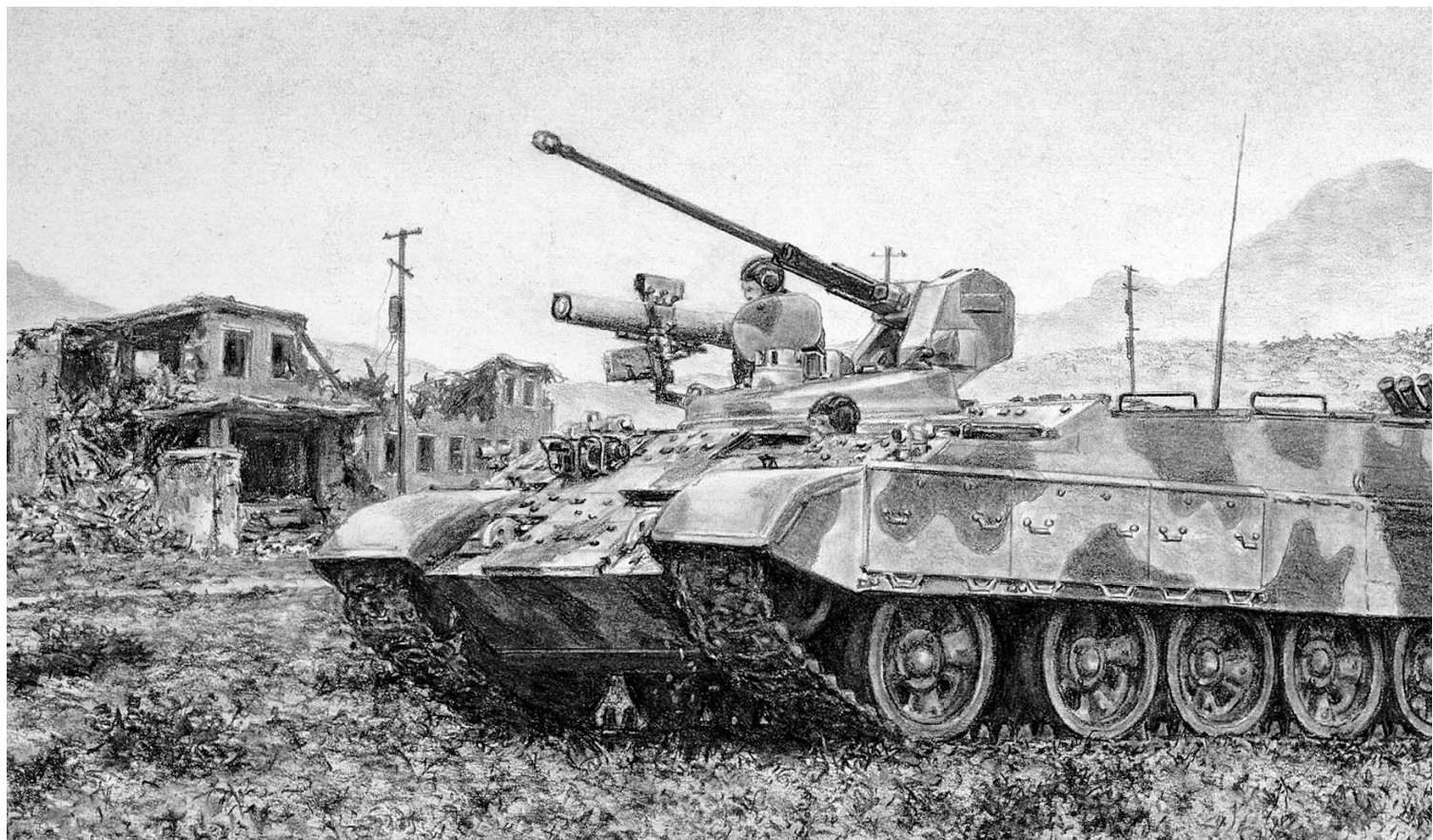
Dr. Joseph D. Hagman is a senior research psychologist at the U.S. Army Research Institute's field office at Gowen Field, Idaho (208-334-9390). He received a Ph.D. in engineering psychology from New Mexico State University. His research interests are in human learning and memory, and more recently, in soldier performance on armor-related simulation and training devices.

Date: 2/2/98 Division: N/A
Range: MPRC Brigade: 116th Cav
Location: Gowen field, ID Battalion: 2-3 116th
Company: A-E

Predictions of 1st-Run Live-Fire Scores on Tank Gunnery/Table VIII From Device-Based Scores on COFT/Exercise 131

Device Score	Predicted Average Live-Fire Score	Chances (%) of a Live-Fire Score > 700
541	543	10
616	595	20
674	636	30
721	669	40
765	700	50
809	731	60
856	764	70
914	805	80
989	857	90

Figure 4. Sample Prediction Table.

The Resurrection of Russian Armor: Surprises from Siberia

by Jim Warford

In September 1997, the Russians held the second annual VTTV Omsk '97 International Exhibition of Armaments, Military Equipment, and Conversion products. Delegations from 50 countries visited the show, and the products on display were supplied by more than 160 producers from within the former Soviet Union. While the list of the military vehicles and equipment on display was impressive and included the T-90S MBT, most of the hardware on show was well-known to those present. There were, as always, some exceptions. Of all the surprises, including the DROZD-equipped T-80U and the ARENA-equipped T-80UM-1 Snow Leopard MBTs, perhaps the most surprising were the new T-55-based BTR-T heavy APC and the Black Eagle MBT.

Information on the BTR-T heavy APC started to appear in the defense press in 1997. Based on a turretless, heavily modified T-55 MBT hull, the BTR-T is an impressive vehicle. Like its very similar Israeli cousin, the Achzarit heavy assault carrier, the BTR-T was "born of battle." In the 1982 war in Lebanon, inadequately protected Israeli mechanized infantry suffered many combat casualties. The results of these losses were both dissatisfaction with the M113 APC and the development of a new requirement for a more heavily armored "assault carrier." The Israelis were looking for a vehicle that could successfully approach a defended objective, while providing a level of protection for its infantry as close as possible to that of an MBT. The Achzarit, also based on a heavily modified T-54 or T-55 hull, went into production in 1988 and as many as 300-400 are in Israeli service.[1] The Achzarit weighs 44 tons (compared to 36 tons for the standard T-55), is powered by either a 650 hp diesel engine (the Achzarit 1) or a 850 hp diesel engine (the Achzarit 2), and can carry

seven infantrymen plus the vehicle's three-man crew. Of all the vehicle's characteristics, the armor protection provided was the highest priority. Reportedly, 14 tons of the vehicle's total weight is devoted to armor protection. While the exact type and configuration of the armor carried by the Achzarit is still classified, published sources say that it is protected by advanced composite armor.

The Russian BTR-T was also the result of a significant need discovered in combat. On December 14, 1994 the Russians deployed in Chechnya a force that would quickly grow to 2,221 armored vehicles. Before that bitter action was over, the Russians would lose 225-250 armored vehicles, according to the former Russian Minister of Defense, General Grachev. The infantry carriers that were deployed by the Russians included the BMP-2, BMD-1, and BTR-70. Of these three vehicles, the BMP-2 is the most heavily

HARMON

armored, although it still proved to be very vulnerable to Chechen antiarmor hunter-killer teams equipped with the RPG-7 or RPG-18. In fact, published vulnerability studies indicate that the BMP-2 was basically a rolling "killing zone." With the exception of the BMP-2's turret front and engine compartment, Chechen RPG gunners could aim and hit anywhere on the vehicle and were virtually assured a kill.[2]

The solution to this serious problem was unveiled to the public for the first time at the Omsk Exhibition. The BTR-T at the show was armed with the 2A42 30mm cannon in an elevated mounting above a very low-profile one-man turret.

Additionally, the Konkurs ATGM (NATO AT-5/AT-5B Spandrel) was pintle-mounted on the right side of the turret. This armament configuration, however, is just the beginning of the BTR-T's firepower options. The Russians have designed the BTR-T to carry a wide variety of armament including both Russian and "NATO armament complexes."

Russian weapons options include the 2A42 combined with the AGS-17 automatic grenade launcher, the 2A38 twin-barrel 30mm cannons, and the NSV 12.7mm machine gun combined with an elevated twin Konkurs ATGM launcher.[3] The BTR-T weighs 38.5 tons and is capable of a maximum speed of 50 kph. The vehicle carries a total of five infan-

trymen plus the vehicle commander and driver. Perhaps the most significant drawback in the BTR-T's design is the fact that the infantrymen can only exit the vehicle through hatches in the roof. The removal of the T-55's original turret has allowed the crew and carried-infantry compartment to be positioned at the front of the hull, with the engine compartment at the rear.

The losses suffered by "mounted" Russian mechanized infantry units in Chechnya left a huge impression on the Russian military, and dictated the response that any new vehicle would have vastly improved armor protection as its design priority. For the Russians, that meant fitting their new heavy APC with the same Kontakt-5 explosive reactive armor (ERA) that protects their MBTs. Currently fitted to the T-72BM, T-80U, T-80UM, T-80UM Model 1993, T-80UM Model 1995, T-80UK, T-80UM-1 Snow Leopard, T-90S, Black Eagle, and the Ukrainian T-80UD and T-84 MBTs, Kontakt-5 has increased the protection provided to new levels.

Unlike earlier generations of ERA, Kontakt-5 offers effective protection against both chemical energy and kinetic energy weapons. "If fitted to a T-55 MBT (the basis of the BTR-T), it will increase the armor protection level against kinetic energy ammunition from the equivalent of 200mm RHA to the equivalent of 480mm of RHA."[4]

According to *Jane's International Defense Review (7/1997)*, during live-fire testing in the U.S., Russian T-72s fitted with Kontakt-5 were "immune" to 120mm M829 APFSDS ammunition. Arguably the best protected APC in existence, the new BTR-T has sealed the fate of the BMP series where the protection of mounted infantry is a priority. When compared to the more complex BMP-3 IFV, the BTR-T not only represents a whole new level of survivability, but is also available for sale at a much lower cost. The burned and shattered hulks of BMPs, once characteristic of recent conflict, may be a thing of the past. The BTR-T is the Russian application of hard lessons learned in battle.

During the Cold War, very few Soviet threats received more attention and concern than the Future Soviet Tank or FST. The FST designation actually grew to include a variety of Soviet developments. FST-1, for example, was not a single tank, but actually represented a level of technology embodied by two Soviet tanks; the T-72B and T-80U. Both of these MBTs were put into production in 1985, and incorporated new levels of technology. The T-72B and T-80U, for example, were capable of firing the newly developed Svir (T-72B) and Refleks (T-80U) (NATO AT-11 Sniper) main-gun-launched ATGMs. The FST-2 designation referred to the next-generation Soviet tank that was thought to signal the return of innovation and

high-risk technology to Soviet tank design. Reportedly, the FST-2 was actually known as the "Object 477 Molot" (Hammer) and was under development at the Kharkov tank plant in Ukraine.[5] The mystery surrounding this tank cleared for a short time in 1988 when the open press suddenly reported its existence to the public. Although originally misidentified as the FST-1, articles and drawings including those appearing in *Newsweek, Army Times,* and the *Daily Telegraph*, described a radically new tank with innovative characteristics:

- A low-profile unmanned turret

- 2- or 3-man crew, all located in the hull

- 135mm main gun firing at a muzzle velocity of over 1900 meters per second

- Sophisticated electronics, including a counter-optics device called LASAR, capable of blinding NATO's binoculars and optical systems

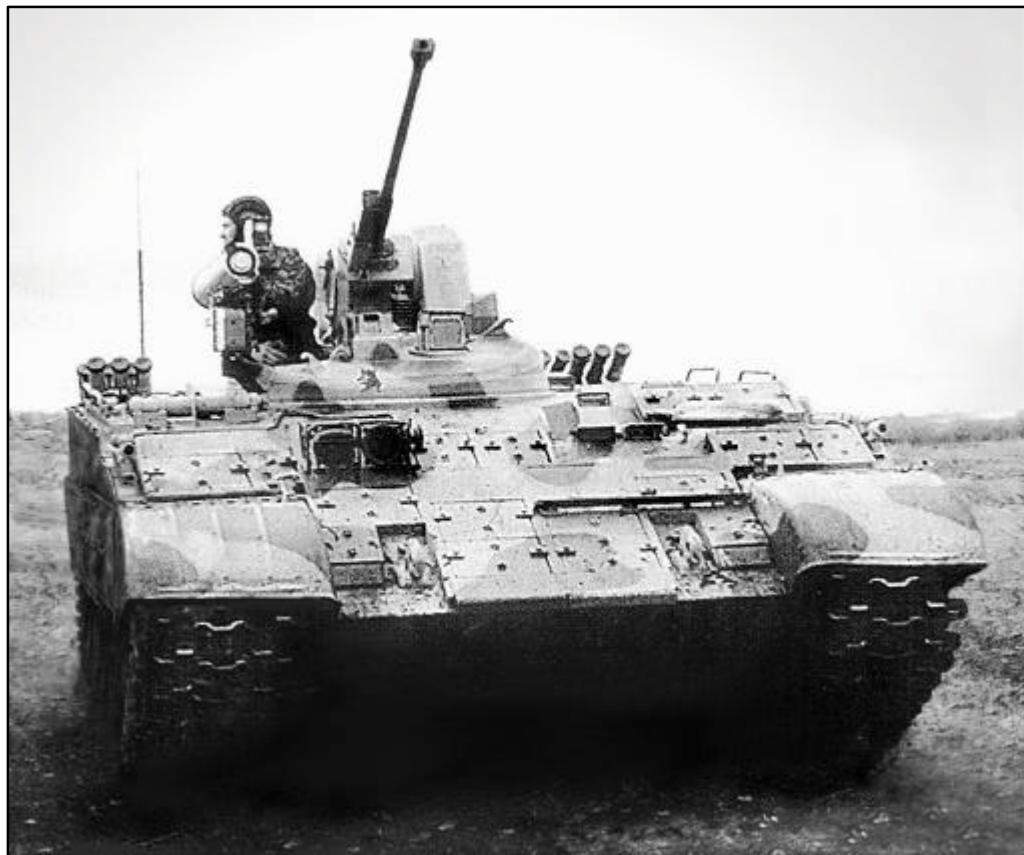- Layered-ceramic composite armor capable of defeating NATO's best antitank weapons

The significance of the threat imposed by the FST-2 during that period of the Cold War cannot be overstated. According to retired General Donn A. Starry, "the Soviets have achieved a technical development at the tactical level of war which has strategic implications. We haven't seen anything like that in Europe since the advent of tactical nuclear weapons."[6]

The threat imposed by the FST-2 was certainly the primary consideration in the decision to spend a reported 1 billion dollars to develop and add depleted uranium armor to U.S. M1A1 MBTs. The FST-3 is even more mysterious than the FST-2, and very little about it has appeared in the press. One published report stated that the U.S. Army's once planned replacement for the M1, the "Block 3 Tank," was specifically intended to counter the advanced Soviet FST-3. Other sources have reported that the FST-3 design incorporated a revolutionary new electro-magnetic type armor, that could signal the end of conventional antitank weapons. The intent of electro-

magnetic armor is to destroy an attacking projectile with an extremely powerful electric charge. When the projectile hits the tank armor, it completes an electronic circuit and basically destroys itself.

According to *Soviet Military Power 1989,* Soviet tank technology was not only equivalent to that of the U.S. at the

The heavy BTR-T armored personnel carrier, reminiscent of the Israeli Achzarit, is a converted T-55 tank hull that offers much better protection than a BMP-class vehicle. It is armed with the 2A42 30mm cannon in an elevated mounting above a very low-profile one-man turret. Additionally, the Konkurs ATGM (NATO AT-5/AT-5B Spandrel) was pintle-mounted on the right side of the turret.

time, the relative technology level was in fact changing significantly in favor of the Soviet Union. As suddenly as they appeared, the FST-2 and FST-3 both disappeared from public view. The mystery and secrecy surrounding these Soviet tank developments returned and covered them completely.

In 1995, word began to surface about a new Russian MBT. Information about this new tank began to appear on a fairly regular basis: a **"revolutionary Russian MBT prototype"** was announced in January; work on a **"fundamentally new tank"** was said to be under-way in September and scheduled to be completed within a couple of years; and in Novem-

ber, a **"radically new MBT"** was reportedly being worked on, with the first prototype due out as early as 1997.[7] According to published reports, this new MBT is armed with a new 135mm-140mm main gun, incorporates greatly improved armor protection, and may be designated the T-95. Then, in September 1997, the Chiorny Oriol MBT (Black Eagle) appeared right on schedule. Its appearance at the OMSK exhibition, however, was fleeting. The tank was shown with its new, much larger turret completely covered by a large camouflage net, and was driven in front of spectators at a distance to prevent close examination. Both Russian sources and Western analysts have since reported that the Black Eagle tank at Omsk was, in fact, a test-bed or technology demonstrator of a 21st century Russian tank.

"The Black Eagle shown at Omsk was armed with a very large main gun of unconfirmed size. Russian press reports have stated that the tank may be armed with a 152mm main gun, while other sources suggest the gun is actually somewhere between 135mm and 140mm."

While available information concerning the Black Eagle is limited, most of it from press reports in *Itar-Tass*, *Tekhnika i Vooruzhenie*, and *Izvestiya*, some of the tank's impressive characteristics can be given a closer look. Like the BTR-T, the Black Eagle is the result of hard-lessons learned in battle. The Black Eagle shown at Omsk was armed with a very large main gun of unconfirmed size. Russian press reports have stated that the tank may be armed with a 152mm main gun, while other sources suggest the gun is actually somewhere between 135mm and 140mm. Like the turret, the Black Eagle's main gun was covered, but the -evacuator and extreme barrel length couldn't be completely hidden. The main gun also appears to be mounted higher in the turret, with the mounting itself protruding out of the turret frontal armor more than normal. The new turret is shaped much more like modern Western MBTs, and has a distinctly box-shaped bustle. According to the Russians, the turret is welded and will include a bustle-mounted autoloader. This represents a dramatic change in Russian tank design, and is probably a direct result of the call for improved and more surviv-able designs after the tank losses suffered in Chechnya. The main gun ammo, now stored in the turret rear, is separated from the tank's crew by an armored bulkhead. Russian reports state that this new ammo arrangement allows longer, more power-ful APFSDS rounds to be used. Basically, nothing is known about the tank's fire control system, beyond the reports that it is equipped with an "on-board information system" capable of monitoring vehicle systems, and exchanging data with other tanks and its headquarters.

The Black Eagle is powered by a new 1500 hp gas-turbine engine and weighs somewhere around 50 tons. The hull shown at Omsk is based on that of the well-known T-80U, also produced at the Omsk Plant. Since the new turret was covered, very little is known about the tank's armor protection beyond the combined armor and Kontakt-5 protecting the hull. The turret front is apparently fitted with "active protection elements" or ERA and is more sloped than normal, reminiscent of the British Chieftain MBT. There also appears to be a significant gap between the hull and the lower turret-frontal arrays of ERA. Finally, the exact type and capabilities of the armor protecting the Black Eagle is obviously still a mys-tery. Based on what is known about So-

viet/Russian armor development, ranging from the early days of the T-64 MBT to the Russian version of Chobham armor protecting the T-90, and the multilayer applique armor added to the turret and glacis of the T-55AM2B, the Black Eagle could certainly be fitted with armor pro-tection rivaling that of its more modern Western counterparts.

The intended role of the Black Eagle is still not completely clear. Some sources say that it is intended for the export mar-ket, leaving the Russian Army in the ca-pable hands of the T-90 and T-80U vari-ants like the T-80UM-1. While others state that its more likely that the T-80UM-1 will be promoted for export, leaving the Black Eagle to meet future Russian Army requirements. Russian sources say this new tank may be fielded as early as mid-1999, while others report that the first batch of 50 vehicles will be produced within the next two years. Whatever the case, the Black Eagle (or a new production MBT developed from it) will be deployed in the near future. While the relationship between the Black Eagle and the FST-2 and/or FST-3 also remains to be seen, one thing is certain; the Sovi-ets/Russians have been working on an innovative new MBT since at least the mid-to-late 1980s. The new Russian tank, which may or may not be known as the T-95, will most likely be either the pro-duction model of the Black Eagle, or the present-day equivalent of the FST-2 and/or FST-3. Interestingly enough, ac-cording to *Armed Forces Journal Inter-national (5/1998),* the Russians have recently patented a form of electro-magnetic armor, so a tank with the capa-bilities of the FST-2 and FST-3 may al-ready be here.

Finally, all indications as of now support the conviction that the current state of affairs in Russia will continue to compli-cate and duplicate tank development and production. If it's to remain a viable con-tributor to the future of Russian armor, the other operating tank producer, the Uralvagon tank plant at Nizhni Tagil, will have to respond to Omsk's Black Eagle with their own new "post-Chechnya" tank design. Since Nizhni Tagil is the plant that produces the T-90 and T-90S, it's logical to expect a redesigned Black Eagle-like MBT based on the T-90 to appear in the near future. So, the most likely scenario is that not one, but two new Russian MBTs will soon materialize. The BTR-T and the Black Eagle are criti-

cal to the Russian military's efforts to regain its position as a leader in IFV and tank development and production. No longer able to ignore the catastrophic loss of so many of their armored vehicles in various conflicts around the world, the Russians have indeed shown that they have applied what they've learned. While the BTR-T confirms what the Russians are capable of doing in a very short pe-riod of time, the Black Eagle is a clear demonstration that the Russians are still capable of a few surprises.

Notes

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[5]Zaloga, Steven, "Fall From Grace: Russia's Once-Vaunted Tank Industry Waits for a Mira-cle," *Armed Forces Journal International,* May, 1998.

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[7]Foss, Christopher F., "T-90 in production, new tank set for '97 debut," *Jane's Defence Weekly,* November 11, 1995.

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Assembly Area Operations:

A Paradigm Shift to Warfighting Maintenance

by Lieutenant Colonel Charles A. Anderson and Major Jeffrey A. Cobb

It's maintenance day in your unit. Soldiers and their first line supervisors head to the motor pool to conduct their weekly preventive maintenance checks and services (PMCS). The unit is present for duty and stands ready for action in the motor pool.

The traditional, motivational speech on quality PMCS in accordance with up-to-date technical manuals falls on deaf ears. The formation ends, and the exodus begins, as soldiers head off to appointments, details, small arms ranges, classes, and meetings — anyplace but the motor pool. The remaining soldiers head to their vehicles, search for the most recent copy of their 5988E, and discuss their weekend adventures. Commanders, first sergeants, and platoon leaders all head off to check on the issues of the day. Staff officers and soldiers head for the shelter and the 5000 btu heater or air conditioner of the battalion and company headquarters. Perhaps a few soldiers, under the supervision of an NCO, stay behind to complete the PMCS(s) on the unit's equipment. At the end of the day, the ULLS clerks face a stack of 5988Es. The battalion reassembles and pats itself on the back for another great maintenance day.

The above paragraph paints a picture of an eventual decline in unit readiness. Let's change the scene to the Central Corridor at the National Training Center (NTC). Soldiers, supervisors, and leaders are conducting maintenance on all assigned equipment. Tactical operations centers at the platoon, battery, and battalion level are manned and operational. Commanders at all levels have issued priorities of work for the day, and are tracking the progress of the crews in executing these priorities. All communications are executed using SINCGARS (in frequency hop secure) or EPLRS (from the net control station down to simplified hand-held terminal units [SHTU] over the FAADC3I network). The unit controls access into and out of the assembly area. Senior leaders, both officers and noncommissioned officers, are visible and supervising the operations. The logisticians (BN XO, BMO, S1, S4, btry XOs, supply sergeants, and maintenance technicians) all meet to coordinate and verify logistical actions. Mechanics are on their own equipment, ensuring that it is mission capable prior to deployment

from the area, and are a radio call away to assist other operators who identify non-mission capable faults. PLL clerks build logistics packages consisting of parts identified on the "parts received/not installed" printout and push them down to the platoons and sections. The status of 5988Es is tracked and the documents are turned in to the ULLS clerks in a timely manner for processing. Leaders are out checking the status of the priorities of work, and in return they get a feel for the combat readiness of the unit prior to LD. This sounds like a unit setting itself up for future successes. Imagine picking that unit up from the Central Corridor and placing it back in its home-station motor pool. However, you tell the soldiers and leaders to replicate the same tasks under the same conditions. Well, the Renegades of the 4th Battalion, 5th Air Defense Artillery Regiment of the 1st Cavalry Division at Fort Hood, Texas, took the challenge issued to them from Brigadier General Honore, then ADC(S) of the 1st Cavalry Division, and have been executing assembly area operations in what was once our motor pool ever since.

The Renegades implemented AAO in February 1997. The cornerstone of this program is the application of the Army's 8-Step Training Model. Assembly area operations include several key components. First, they integrate all steps of the training model into maintenance operations; second, they require and enforce leader involvement at all levels, from vehicle commanders to the battalion commander; third, they sustain perishable skills through repetitive execution; and fourth, they effectively link training and maintenance.

AAO is not limited to vehicle PMCS; it is focused on maintenance of all unit equipment, to include communications, NBC, small arms, crew-served weapons, operations centers, and command and control systems. Commanders at all levels set and enforce their priorities of work for the day in any or all of these areas. Units conducting recoil or deployment preparation operations execute the assigned tasks for the day as their priorities.

8 Step Training Model

The 8-Step training model is the basis for all training in the Army. Leaders can apply this model to all areas in a unit.

1. Plan the Training. The commanders and staff officers plan the training by analyzing the training calendar, training guidance, safety messages, and other documents that require the performance of tasks on the unit's equipment. The battalion commander may set battalion level priorities of work for AAO at least 2 to 3 weeks out during the battalion training meeting. The commander may choose to limit these priorities to allow the batteries to execute their tasks, or the commander may set the priorities for the battalion as a whole. Priorities may be as simple as operator PMCS, or be specifically stated, such as water trailer purification. AAO doctrine is for platoon sergeants to identify the priorities of work, and these priorities are planned and coordinated at platoon, battery, and battalion training meetings.

2. Train and Certify Leaders. The unit must then train and certify its leaders at all levels. All leaders in the unit are certified on the PMCS of their assigned vehicles. Occasionally, the unit will identify a priority that requires additional training and certification, which the unit quickly plans and executes. The PMCS certification program is decentralized to battery level and is additionally part of the battalion's in-processing program, and should include a hands-on and written test.

3. Recon the Site. For AAO, this recon is focused on establishing tactical operations centers in an area that facilitates their operation, and allows leaders to properly monitor and command and control the operations. All TOCs, from platoon to battalion, are set and operational.

4. Issue the Plan. Leaders at all levels issue their plans in the form of priorities of work. These priorities are posted on dry erase boards in platoon leader vehicles, battery TOCs, the ALOC, and the battalion TOC. These priorities include the METL task(s), collective task(s), and priority tasks for the day. It is important that leaders take the time to properly plan for this event, as too few tasks will lead to idle soldiers and will waste the unit's most valuable resource — time; and too many tasks will lead to unfinished requirements and frustrated soldiers and leaders.

5. Rehearse. This step is critical to the success of the program. Leaders must ensure that they pick up the COMSEC required to operate SINCGARS and EPLRS radios; issue 5988Es prior to beginning operations (day prior); refine service schedules during briefings to the battalion commander; and conduct PCIs and PCCs prior to the day of execution.

6. Execute. The unit conducts AAO in accordance with the stated priorities of work. Operations centers and leaders track the progress of subordinate units to ensure proper execution, and report their status to higher. A key part of the execution of AAO is leader pre-combat inspections. Leaders don't have time to check everything, but they can sample portions of the stated priorities of work.

7. Conduct AARs. At the end of the day, key leaders come together and discuss the execution of the operations. Shortfalls are placed on the leader's pre-combat inspection lists to ensure that they are addressed prior to the next AAO.

8. Retrain. The leaders correct noted deficiencies and continue to train their subordinate leaders to standard. It is critical that the unit quickly corrects shortfalls to prevent a recurring deficiency.

Assembly Area Operations

The Renegades conduct assembly area operations on the first work day of every week. Using the 8-Step Model, the battalion begins its preparation for each day in the assembly area by clearing the calendar of all distracters and identifying the priorities of work at all levels. The battalion commander issues his priorities two to three weeks out, and platoon leaders/sergeants develop their priorities during their training meetings and brief them to the commander during the weekly battalion training meeting. Every attempt is made to ensure that no other events are planned on AAO. This includes small arms ranges, meetings (other than the logistics meeting), briefings, and other distracters. Soldiers are strongly discouraged from planning appointments on this day. The idea is to maximize participation. One fifth of the training week is spent on maintenance and we strive to gain the most benefit.

All leaders and soldiers in the battalion are trained and certified on their ability to conduct a proper PMCS on their assigned equipment.

New soldiers are certified during the battalion's two-week in-processing. Soldiers who fail to meet the standard are retrained by the battery motor sergeant. The percentage of trained and certified

soldiers and leaders is tracked and briefed weekly during the battalion training meeting. Units cannot receive a "P" on numerous METL tasks without at least a 75% certification rate.

Special staff officers certify soldiers and leaders on equipment in their areas of expertise. This is accomplished in at least two battalion-level forums. The first is the Renegade Officer Certification program. This program is conducted on a monthly basis, and trains and certifies all officers on a wide range of equipment including SINCGARS, ELPRS, Identification Friend or Foe, TAMMS/PLL operations, small arms and crew-served weapons, and PMCS. The second forum is AAO. A recent example is the chemical officer and all NBC NCOs certifying all leaders on the proper PMCS and cleaning of the M-40 and M-42 protective mask.
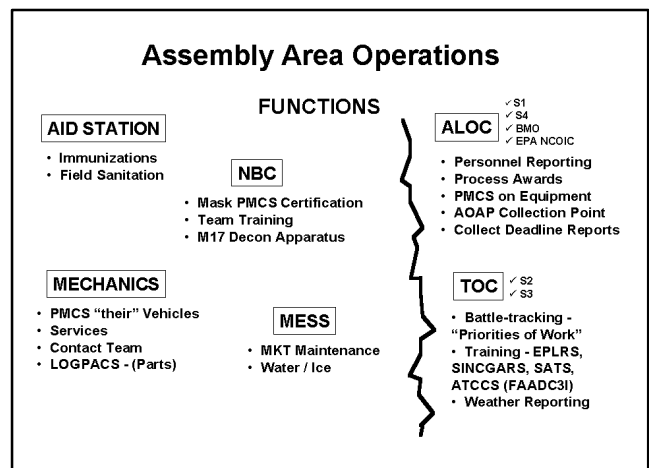
A key component of the operation is the location of the tactical operations centers. They must be visible and accessible in the assembly area. All of the battalion and battery TOCs are parked hub-to-hub near the entrance to the assembly area. Ramps are down, or doors are open, and they are manned by assigned TOC personnel. Each battery posts its priorities for the day on dry erase boards outside the TOC (FIG). The S3 section tracks these priorities for the battalion commander, and the ALOC receives and posts the personnel status for the day. And, by the way, the TOC operators do a PMCS on the command post vehicle, trailer, and associated generators!

Leaders conduct their pre-combat checks and inspections during the week prior to entering the assembly area. They ensure that their subordinates understand the priorities, assemble the necessary equipment, issue the 5988Es, and secure the required COMSEC.

Finally, the day arrives. The Renegades, fresh from a vigorous physical training session, occupy the assembly area. The entire battalion is present (to include the staff), and the assembly area is secured (guards are posted at both gates to control access into and out of the area). The CSM conducts a formation to disseminate any vital information to the soldiers, and releases the units to their 1SGs. The sol-

diers and supervisors head for their equipment to execute assigned priorities.

Maintenance personnel head out on line to execute their assigned priorities for the day, and, if required, to troubleshoot non-mission capable faults identified by operators in their units. Maintenance personnel fix all vehicles as far forward as possible. The battalion commander established an evacuation policy of two hours. This means that if the mechanics can troubleshoot and/or fix the vehicle in two hours or less, they do it on line (fixed forward concept). If it requires more than two hours to fix a fault, the contact team evacuates the vehicle or equipment to the unit maintenance collection point located in the unit's maintenance bay. Tool room operators issue tools from their vehicles, and by the way, they do PMCS the tool

Assembly Area Operations

FUNCTIONS

AID STATION
- Immunizations
- Field Sanitation

NBC
- Mask PMCS Certification
- Team Training
- M17 Decon Apparatus

MECHANICS
- PMCS "their" Vehicles
- Services
- Contact Team
- LOGPACS - (Parts)

MESS
- MKT Maintenance
- Water / Ice

ALOC
✓ S1
✓ S4
✓ BMO
✓ EPA NCOIC
- Personnel Reporting
- Process Awards
- PMCS on Equipment
- AOAP Collection Point
- Collect Deadline Reports

TOC
✓ S2
✓ S3
- Battle-tracking - "Priorities of Work"
- Training - EPLRS, SINCGARS, SATS, ATCCS (FAADC3I)
- Weather Reporting

truck! ULLS, TAMMS, and PLL clerks conduct maintenance on their equipment. The SOP states that 1100 is the first time that a ULLS clerk may enter his office. PLL clerks build logistics packages and push them to the platoons. Motor sergeants and maintenance technicians are on line supervising their mechanics, conducting maintenance on their assigned equipment, tracking the status of their contact teams, and providing support as far forward as possible.

TOC crews man their vehicles and establish communications. The S3 establishes the battalion FM net using frequency hop secure. All TOCs must enter the net prior to 0930 hours. Battery TOCs establish communications with their platoon leaders, and platoon leaders establish communications with their squads. All reports, to include the PERSTAT (Personnel Status Report), travel over this communications network. This marks the accomplishment of the first task for the day and provides continued training on a

host of perishable skills. During one AAO a month, when the division's EPLRS platoon is operational, the battalion establishes its FAADSC3I network from the NCS down to the Simplified Hand-held Terminal Units. Simulated air tracks are passed confirming operator proficiency and equipment status. The battalion found that when it concentrated on these skills for the 1CD Warfighter exercise, soldiers and leaders became very proficient, but they soon lost this skill through lack of use and personnel turbulence. AAO has assisted the unit in maintaining the desired level of proficiency.

The next major task for the leaders is posting the priorities for the day, and visually identifying the status of the unit's weapon systems. TOCs, from battalion to platoon level, post their priorities of work on dry erase boards. Leaders track their progress, mark the tasks off as they are completed, and report to their higher headquarters. Weapon systems commanders post the status of their systems by using range flags — green for fully mission capable, red for vehicle or system non-mission capable, and yellow for communications non-mission capable. This allows leaders and maintainers to easily identify maintenance issues on line.

The battalion executes a "Platoon of the Week" assessment to evaluate the training level of the junior leaders on the 5988E and maintenance management within the platoon. The battalion executive officer identifies a platoon during the first formation to undergo the evaluation. At 1500, the platoon leadership links up with the battalion team (consisting of the BN XO, the maintenance technicians, and battery XOs), and crosswalks each one of his 5988Es to ensure that the faults match the parts on order, and that all parts received are properly accounted for (on the shelf or installed). The team converges on the platoon and conducts further inspections of the platoon, to include technical inspections by sampling the platoon's equipment, and a visual inspection of quadcons or milvans for excess parts, or parts received but not installed. This effort provides a focused look at maintenance management and reinforces training in this area.

At 1200, the battalion XO chairs the weekly, brown-bag logistics meeting. This meeting covers maintenance, supply, and personnel issues facing the battalion, and is attended by battery XOs, supply sergeants, maintenance technicians, the BMO, S4, S1, and the chemical officer. The XO conducts a mid-course

AAR to let the batteries know how the operation is progressing to date, and directs corrections designed to meet the commander's intent and priorities for the day. The BMO covers the O26 report, with the batteries filling in key information, or providing up-to-the-minute updates on the status of their non-mission-capable equipment. The next major order of business is the list of Army Oil Analysis Program samples due. This is a final check on the battalion's system, and requires that the units submit all samples to the BMO prior to departing the assembly area. The BN XO and staff discuss any HAZMAT issues, safety of use messages, and other maintenance or EPA-related issues. The chemical officer identifies CAMS and M-8 alarms requiring wipe tests. The CHEMO projects this data at least 30 days out, and continuously tracks the status of the turn-ins.

The S4 discusses any supply issues facing the battalion and then walks the batteries through the lateral transfer list, line-by-line. The focus of this effort is on transfers or turn-ins due within the next 45 days. The focus then shifts to reports of survey. The XOs are questioned on the status of any surveys due to the battalion, and the progress of investigations being conducted by officers in their unit. Finally, the S4 raises any force modernization issues which the battalion must deal with in the coming months.

The final phase of the meeting, other than issues raised by the batteries and closing comments from the BN XO, involves the personnel aspects of logistics. The S1 works the battery XOs on all OERs, NCOERs, and awards status. Additionally, the S1 covers any other personnel issues such as VHA surveys, CFC, and publications. This meeting improved the logistics readiness of the battalion in several ways. First, battery XOs are more involved in the logistics operations of their units because they must be prepared to address issues in all areas. Second, it is a forum for mentoring the XOs and other logistics personnel. Finally, it improved the readiness of the battalion in several key areas such as lateral transfers, reports of survey, O26 tracking and updating, and efficiency reports and awards by improving the information flow and the focus of the logisticians.

As the day progresses, soldiers complete the assigned tasks and report their status to higher headquarters. Leaders mark off their priorities as their subordinates execute them, and then verify the completion through spot checks. Commanders and key leaders remain in the assembly area supervising the execution of their priori-

ties. They conduct the AAR prior to departing from the assembly area at the end of the day to identify any key shortfalls requiring their attention. The final event of the day is the close-out formation conducted by the CSM.

Assembly area operations has paid great dividends to the Renegade battalion, including:

- Soldiers and leaders are present, and they are more focused in the execution of maintenance operations.

- The battalion effectively links training and maintenance, and is able to train repetitively to standard on perishable skills such as frequency hop secure and EPLRS.

- The leadership is able to capture the hard to get soldiers, including cooks, medics, and staff personnel, and get them into the assembly area, resulting in the headquarters vehicles receiving much needed attention.

- The leadership fences AAO days by limiting distractions, thus allowing maximum participation.

- The battalion is able to focus on one maintenance SOP — warfighting, not garrison.

- The battle staffs at all levels receive training on battle-tracking on a weekly basis.

- The battery-level logisticians are more focused and can train their contact teams every week.

This operation requires a significant investment on the part of the leadership. The leaders and key staff must pull themselves away from their computers and telephones for the entire day. However, the payoff is well worth the investment.

AAO is different than traditional maintenance systems and programs. To improve the results of maintenance in a technologically advanced unit, one must adapt new conditions. The conditions set in the Renegade Battalion are visibly different. On the corner of Hood Road and Park is the Renegade Assembly Area, once referred to as the motor pool. And every Monday, the battalion is conducting high intensity, no-nonsense training, just like they do in the central corridor at the NTC.

LTC Charles A. Anderson commands 4-5 ADA, 1st Cav Division, Ft. Hood, Texas. MAJ Jeffrey A. Cobb is the 4-5 ADA executive officer.

Revitalizing the Support Platoon

Gaining Flexibility With the Palletized Load System

by Captain Michael S. Flynn and Captain Jackson C. MacDonald

A LOGPAC Vignette

Your 1SG picks up your LOGPAC, consisting of the supply truck, two HEMTT cargos and two HEMTT fuelers, from the logistics release point (LRP) at 1800 hrs. The 1SG must return your LOGPAC slice to the LRP within two hours or face the support platoon leader's wrath. The clock is ticking. Due to your remote company location, your 1SG finally arrives at 1830 hrs. You now have effectively one hour to conduct LOGPAC operations. However the tactical situation only allows you to pull a section at a time off line to resupply. Of course, Murphy's Law still applies as you discover the PTO on a HEMTT fueler is out and you must transfer the fuel by gravity feed. This will more than double your refuel time. This refueling delay will cause a ripple effect, and you also will not be able to re-arm all of your tanks within the two-hour LOGPAC time window. Examine your options. Now, what do you do?

Miss the LRP return link-up time, which will require the 1SG to make the four-hour return trip to the field trains to escort your LOGPAC slice.

Download Class V honeycomb pallets and stop refueling at 1930 hrs in order to make the LRP link-up. You can then upload ammunition when you get time.

Request an LRP time extension — DENIED!! The support platoon must return to the BSA to meet its scheduled LRP with higher headquarters.

No option looks good. Does this situation sound familiar?

Current Limitations

The support platoon is the backbone of the armor battalion. Whether this platoon is organized within the BN/TF HHC or in the proposed forward support company (FSC) of the forward support battalion (FSB), the platoon's capability remains critical to the heavy task force's success. The current equipment and doctrinal employment of the support platoon have imposed restrictions and limitations on the supported maneuver units:

-Limited time available to conduct the LOGPAC at company level.

-Tactical situation may dictate last minute change to the LOGPAC schedule.

-Support platoon vehicles must be available for resupply from higher headquarters.

-HEMTT fueler inflexibility.

-HEMTT cargo trans-loading time.

These problems will be compounded with the advent of Force XXI and the three-company armor battalion. Force XXI will dramatically expand the area of operations (AO) of a heavy task force. Tank companies will operate in much larger sectors, with more dispersion between vehicles and personnel, further increasing the challenge of resupply. While the current MTOE and doctrinal employment are relatively effective, there is a need to review the support platoon in relation to developments in trucks and equipment technology.

Revitalized Support Platoon

To meet the more demanding resupply challenges, a support platoon based on the M1074 Palletized Load System (PLS) is the solution. By using the PLS with trailers and various flatrack systems, the PLS easily becomes a flexible multipurpose resupply vehicle.

The PLS is comprised of a 16.5-ton payload tactical truck equipped with a flatrack. The truck is a 5-axle, 10-wheel drive vehicle equipped with a 500-hp Detroit Diesel engine, Allison automatic transmission, and central tire inflation system. This combination provides a

highly mobile system capable of transporting its payload in virtually any type of terrain, in any type of weather, and maintaining pace with the armor battalion it supports.[1]

The strength of the PLS lies in its ability to carry various flatracks. This allows one vehicle to perform several missions, unlike the current HEMTT Family of Vehicles. The standard sideless flatrack, M1077, is used to transport pallets of ammunition and other supplies. Another flatrack currently under evaluation is a 3000-gallon fuel tank and pump module.[2] This unit can conduct refuel operations while mounted on a PLS or after being downloaded, allowing the PLS truck simultaneously to conduct another mission.

The PLS truck can also pull the M1076 trailer. This trailer is a 3-axle, wagon style trailer with a 16.5-ton payload, and is equipped with a flatrack that is interchangeable between the truck and trailer. The combination of truck and trailer provides the combined payload capacity of 33 tons. The flatracks are lifted on and off the truck and trailer by a hydraulic powered arm mounted on the truck, eliminating the need for additional material-handling equipment.

The controls for the arm are located inside the cab, allowing the operator to load or unload the truck in less than one minute without leaving the cab.[3]

Additional Equipment - To aid in the rapid accomplishment of the support platoon mission, the PLS trucks would be equipped with a variety of equipment.

Equip each PLS truck with a Variable Reach Material Handling Crane capable of lifting 3,900 lbs at 12.1 m. This crane gives the support platoon the ability to easily build combat-configured loads as necessary without external material-handling support.

In Force XXI, maneuver units will operate in a widely dispersed AO. This will create the need to resupply companies with independent LOGPACs. These independent LOGPACs require communications equipment to successfully and safely accomplish their assigned missions, thus it is necessary to equip each PLS truck with SINCGARS radio.

Due to the dispersion, each PLS also requires a GPS and a GPS tracking system. This would assist the crew with navigation and the marking of downloaded flatrack locations. The GPS tracking system would enable the support platoon leader and platoon sergeant to accurately monitor and direct the position of logistics assets on the battlefield.

Revised MTOE

A PLS support platoon would be organized similar to the current support platoon MTOE with a platoon HQ, a headquarters squad, and three line company squads. The platoon HQ consists of identically equipped HMMWVs for the platoon leader and platoon sergeant. These HMMWVs would be equipped with applique, providing the platoon leadership greater ability to command and control their assets. The headquarters squad would consist of vehicles to support TF decon operations, Class III and V supply operations, miscellaneous cargo and troop transport, and the Class III/V vehicles located in the combat trains. Each line company Class III/V squad would support a corresponding maneuver company, thereby creating a habitual relationship between the squad leader and the supported company.

Personnel

The PLS support platoon would have some significant personnel changes. Regardless of whether the support platoon is organized in the BN/TF HHC or the FSC, the platoon leader must be an armor officer and the platoon sergeant an armor master sergeant. These combat arms leaders possess the necessary tactical experience to accurately anticipate the armor battalion's logistical requirements. An 88M40 would act as the operations sergeant (truckmaster), and provide technical transportation advice to the platoon leader and platoon sergeant. The ammunition NCO must be a 55B20. This position requires an extensive knowledge of

ammunition operations and administration requirements. The train-up time for a 55B would be a fraction of the time required to fully train a soldier from another MOS. The remainder of the enlisted personnel in the platoon would be 88M and 77F. This would allow 19Ks to to continually train for their primary war fighting MOS, tanking!!

Additional Platoon Equipment

There would be equipment changes in addition to the PLS.

The support platoon headquarters would consist of two HMMWVs. This would provide the necessary C2 and flexibility to operate in a much larger area.

Provide the ammunition NCO with a tactical forklift. This forklift would augment the FSB ammo section's forklift during operations at the Ammunition Transfer Point (ATP). This forklift would assist in building Class IV and V combat configured loads on flatracks at the field trains, while the PLS trucks are employed on other missions.

Doctrinal Employment

The adoption of Force XXI will create a need to revise the tactical employment of the support platoon. LOGPAC operations would remain similar to the current method with a few modifications.

The platoon sergeant and/or squad leaders could lead additional LOGPAC convoys, as maneuver companies will be widely dispersed.

If time is a constraint during the resupply at the company position, the PLS can drop flatracks of ammunition and fuel, giving the company commander flexibility to resupply at his convenience. The grids to these dropped flatracks would be recorded using the GPS. PLSs could then recover the single flatracks during the next LOGPAC, or PLSs from the combat trains could be used to consolidate the flatracks in one location for pickup at a more convenient time.

Prestocking ammunition and fuel becomes a quick and simple operation. Since the fuel flatrack is self-contained, the PLS truck and operator are not needed to pump fuel. This frees up the PLS truck to complete another mission.

Units normally maintain an emergency supply of Class III/V in the combat trains. Currently, support platoon trucks must transload supplies or swap vehicles and/or crews to maintain a full supply forward. With the ability of the PLS to rapidly exchange flatracks, it becomes a simple process to keep the same vehicles

Fuel tank and pump unit.

and crews fully supplied at the combat trains.

Currently the battalion counter-mine team is assigned to the support platoon. This team consists of four 5-ton tractors with four M172 lowboy trailers used to transport the battalion mine rollers and mine plows. By using the PLS flatracks, these breaching assets can be prepositioned where needed, eliminating the need for the 5-ton tractors/trailers and their crews.

If the FSB petroleum section is equipped with the PLS instead of the current 5,000-gallon fuel tanker, resupply with the battalion support platoon would be simple and effective. The FSB would exchange an empty fuel flatrack from the support platoon and issue a full flatrack, reducing the time these units are vulnerable to enemy action.

PLS Support Platoon Benefits

It becomes clear there are many benefits in using a PLS-equipped support platoon.

LOGPAC turnaround times are much quicker by dropping flatracks with the supported companies, allowing support platoon vehicles to continue with a simultaneous mission.

The supported company commander has greater flexibility to conduct resupply at the most tactically sound time by rearming and refueling from dropped or prepositioned flatracks at his convenience.

The ability of a PLS truck to carry removable flatracks creates flexibility to quickly perform multiple missions. The removable flatracks allow loads to be configured on dropped flatracks while the truck is conducting another mission.

The support platoon would have exceptional command and control because fewer vehicles would be on LOGPAC convoys, and all vehicles would have a radio and GPS.

Changing the MTOE would eliminate 11 vehicles and 13 soldiers from the current support platoon designed to support the new three-company armor battalion.

The use of all 77F and 88M enlisted soldiers eliminates the need to train 19Ks in alternative MOSs.

CPT Michael S. Flynn enlisted in 1987 and served as a 19D before attending Illinois State University. He was commissioned in May 1994 and graduated from the Armor Officer Advance Course in May 1998. He served with 1-35 AR as a tank platoon leader, support platoon leader, and executive officer. He is currently assigned to 2nd ACR in Fort Polk, La.

CPT Jackson C. MacDonald enlisted in 1991 and served as an 11B before attending OCS. He was commissioned from OCS in 1994 and graduated from the Armor Officer Advance Course in May 1998. He has served with 1-33 AR as a tank platoon leader, assistant battalion S4, support platoon leader, and executive officer. He is currently assigned to HQ USAREUR in Heidelberg, Germany.

PROPOSED MTO&E

Platoon Headquarters

Command & Control

1LT 12B00 (PLT LDR)
PFC 88M10 (DVR)

Command & Control

MSG 19Z00 (PLT SGT)
PFC 88M10 (DVR)

Headquarters Squad

TF DECON

SPC 54B10 (DECON SPC)

AMMUNITION SECTION

SSG 55B30 (AMMO NCO)
PFC 88M10 (VEH DVR)

MISC. TRANSPORTATION

SSG 88M30 (OPNS NCO)
PFC 88M10 (VEH DVR)

CLASS III SECTION

SSG 77F30 (POL SUP)
PFC 77F10 (VEH DVR)

MOGAS

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

CTCP

SSG 88M30 (SEC SGT)
PFC 88M10 (ASST VEH DVR)

CTCP

SGT 88M20 (VEH DVR)
PFC 88M10 (ASST VEH DVR)

CTCP

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

CTCP

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

CTCP

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

3 Tank Company Class III / V Squads

A Company Squad
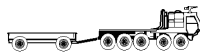
SSG 88M30 (SQD LDR)
SPC 88M10 (ASST VEH DVR)

SGT 88M20 (VEH DVR)
PFC 88M10 (ASST VEH DVR)

SGT 77F20 (POL VEH OPR)
SPC 77F10 (VEH DVR)

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

B Company Squad

SSG 88M30 (SQD LDR)
SPC 88M10 (ASST VEH DVR)

SGT 88M20 (VEH DVR)
PFC 88M10 (ASST VEH DVR)

SGT 77F20 (POL VEH OPR)
SPC 77F10 (VEH DVR)

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

C Company Squad

SSG 88M30 (SQD LDR)
SPC 88M10 (ASST VEH DVR)

SGT 88M20 (VEH DVR)
PFC 88M10 (ASST VEH DVR)

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

SGT 77F20 (POL VEH OPR)
PFC 77F10 (VEH DVR)

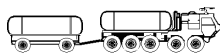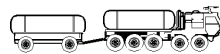# Zone Recon To LOA Steelers

**WHAT'S
YOUR
NEXT
MOVE??**

Situation:

You are "Wolfpack 6," the commander of Delta Team, TF 3-37, with two tank platoons and a mech platoon. Sunrise is at 0600, sunset at 1800.

Enemy:

The 52d MRB has seized Bensonville to our north. It is set up in a deliberate defense on the south side of the town in OBJ GREEN (encompassing OBJ YELLOW and OBJ BLUE, which is east of YELLOW) oriented south. In OBJ YELLOW, we expect an MRC(+). The TF S2 templates that the enemy is established in a well-prepared defense out of contact, with three MRPs in a horseshoe formation tied into the terrain and a dismounted infantry strongpoint on the west side of his defensive position. This strongpoint is templated to have an AT firing line composed of 2A45Ms and AT-5s. The enemy also has an extensive obstacle belt, three dismounted reconnaissance teams (DRT), and two CSOPs forward in the security zone (see map board with original enemy SITEMP and R&S graphics).

The most probable and most dangerous course of action is for the enemy to courageously hold his defensive positions and die in place. He will attempt to piecemeal friendly units with obstacles and indirect fire and destroy them in his kill sack as they move through the restrictive NTC-like terrain north toward Bensonville.

Friendly:

TF Mission: As the main effort of the brigade's attack on OBJ GREEN, TF 3-37 attacks 310600AUG98 to seize OBJ YELLOW, vic 085595, to facilitate passage of follow-on forces that will gain control of Bensonville vic 130700.

Last night the TF scout platoon, which had only six operational HMMWVs, infiltrated through the zone to attempt to reconnoiter enemy positions and obstacles. As of first light this morning, the TF TOC has lost communications with the scouts. Before the TOC lost communications with the scouts (VIPERS), it had received the following information:

- **A section** (VIPER 2 and 3).

  - One vehicle requires recovery vic 044580; the other vehicle is FMC and a patrol is conducting dismounted reconnaissance vic 045594.

  - Reported complex obstacle (triple-strand concertina with AT and AP mines) running NE-SW with difficult bypass at SW end vic 059568; dismounted enemy activity vic 055591.

  - Last SITREP at 0445.

- **B section** (VIPER 4 and 6).

  - Reported point obstacle (wire and mines) with difficult bypass on north side grid 119580.

  - Last reported grid 112606. Last transmission at 0300: "CONTACT NORTH, OUT!" No further contact.

- **C section** (VIPER 1 and 5).

  - Reported two BMPs stationary vic 076556 oriented S-SE at 0030; wire/mine obstacle oriented NE-SW vic 074587 at 0200.

  - VIPER 1 destroyed vic 078588 at 0230; all KIAs.
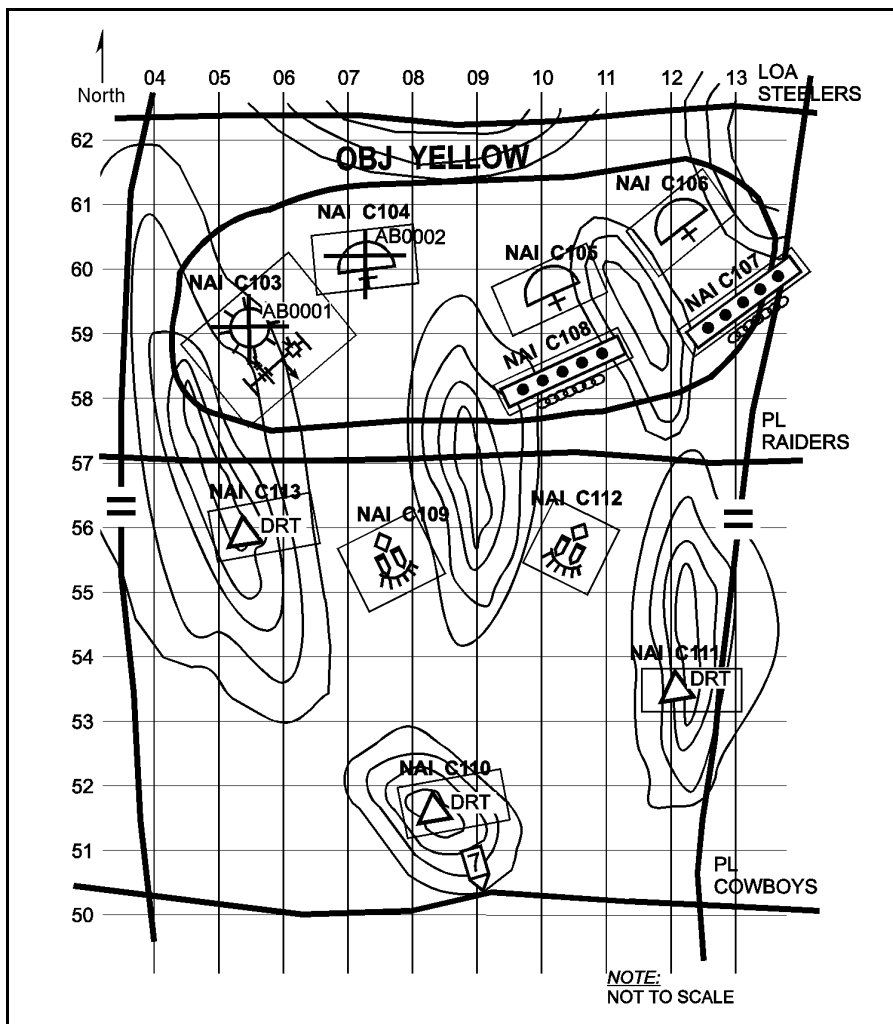
SOLUTIONS – Tactical Vignette 98-3:

"Attack in Brandenburg" from the May-June 1998 issue of ARMOR

THE PROBLEM:

Situation.

Enemy. Remnants of an enemy force are defending the town of Brandenburg to prevent the seizure of the ferry site. Enemy forces have been cleared from PL DISMOUNT to PL SNIPER and are making a final stand along the south bank of the Ohio River north of PL SNIPER. The level of enemy resistance indicates that the enemy remnants have created effective anti-armor kill zones, armed with SAGGER missiles, RPGs, antitank grenades, Molotov cocktails, and sniper fire. The enemy force in OBJ WHITE is reported to have a T-80 and 2 BMPs in support of the dismounted effort.

The most probable and most dangerous course of action is for the enemy remnants to courageously attempt to hold their defensive positions. They will attempt to destroy friendly units piecemeal as they move down the bottleneck streets of Brandenburg.

Friendly. TF 3-37 AR attacks OBJ Bridge (Red, White, and Blue), 071300____98, to seize crossing sites on the south bank of the Ohio River to enable follow-on forces to establish a bridge site at ET729065.

**Scenario.** You are the commander of Delta Team (two tank platoons and one mech platoon with 15 dismounts), TF 3-37. The TF consists of two tank-heavy teams and two mech-heavy teams. You are the TF reserve. The brigade commander wants the TF to seize OBJ BRIDGE in order to support an assault crossing of the Ohio River. TF 2-66 IN has already seized the southern half of Brandenburg (south of PL SNIPER). Alpha Team, TF 3-37, has successfully seized OBJ RED, and Charlie Team, TF 3-37, has successfully seized OBJ BLUE. Both are currently set up in SBF positions oriented north.

In its haste to set up a SBF position, Bravo Team, TF 3-37, attacked its objective in column. A tank platoon was assigned to lead, and the attached infantry platoon was clearing buildings at the southern end of the team's column. While the infantry was clearing the first few buildings on Main Street (1, 2, 20, 21, 22), the team's column of vehicles continued down the street without the support of the infantry platoon. The column proceeded without incident until reaching the northern-most end of the town, where the vehicles were ambushed by antitank fire from the surrounding buildings. The attack destroyed the first two vehicles of the lead tank platoon and the second vehicle of the following mech platoon. Three other vehicles were trapped and eventually destroyed before any dismounted support could assist. Bravo Team recovered the majority of its wounded from Main Street. Bravo 6 reported sighting the following enemy positions: building 13, RPG team; buildings 10 and 16, Sapper teams with small arms fire; building 4, a suspected sniper; a tank to the east of building 12; a BMP north of building 13. Bravo 6 believes there are other buildings that are occupied by enemy remnants armed with antitank and small arms weapons, but he cannot confirm this.

The TF commander has ordered Bravo Team to retain control of buildings it currently holds and to withdraw all remaining vehicles to CP 7 for consolidation. In addition, he has ordered you to assume the Bravo team mission (seize OBJ White) and has given you priority of artillery and mortar fires as soon as you cross PL Sniper. The TF commander has attached an engineer squad to your company team; the 1SG is moving to make linkup at CP 4 in the next five minutes. You also receive reports that some soldiers from Bravo Team are pinned down within the kill zone. Division follow-on forces are rapidly approaching and are expected to reach Brandenburg in one hour. In order for the division to maintain tempo and successfully continue the attack, Brandenburg must be seized and a bridge site established. Your team is currently at CP 5.
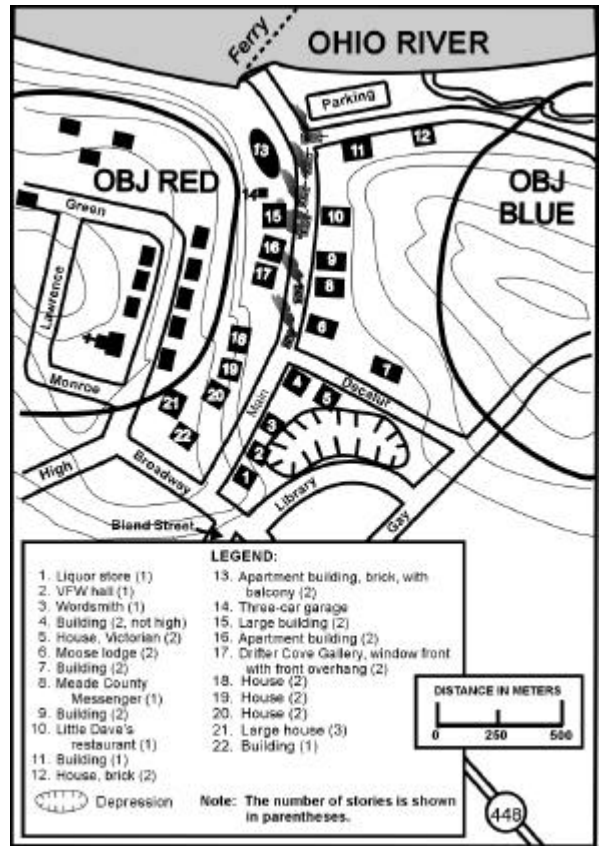
THE SOLUTIONS

Author's Solution

FRAGO:

GUIDONS, this is Black 6, FRAGO follows.

Situation: Remnants of an enemy force are defending the town of Brandenburg. Enemy forces have been cleared from PL DISMOUNT to PL SNIPER, and OBJ RED and OBJ BLUE have been seized. The enemy has created an effective antiarmor kill zone in OBJ WHITE and has employed SAGGER missiles, RPGs, anti-tank grenades, Molotov cocktails, and sniper fire. A T-80 and 2 BMPs have been reported on OBJ WHITE. The enemy will attempt to piecemeal friendly units as they move down the bottleneck streets of Brandenburg. Bravo 6 has reported enemy positions in the following buildings: building 13, RPG team; buildings 10 and 16, Sapper teams with small arms; and building 4, a suspected sniper. Other buildings are believed to be occupied by enemy remnants.

Mission: Team D attacks immediately to seize OBJ WHITE to enable follow-on forces to establish a bridge site vic. grid ET729066.

Intent: (Purpose) To seize OBJ WHITE to allow follow-on forces to establish a bridge site vic grid ET729066. (Endstate) OBJ WHITE has been seized and conditions set for follow-on forces to establish the bridge site.

Tasks to subordinate units:

RED: Isolate OBJ WHITE by establishing an SBF position vic grid ET732063 oriented west. Destroy all enemy dismounted forces and armored vehicles (including the T-80) that could bring effective fires into Brandenburg, preventing Blue (mech) from clearing the town. On order, establish a trafficable passage lane from ET730063 to ET730065 (between Decatur Street and "River" Road) for follow-on forces from the division. The engineer squad is attached to assist you in establishing the lane.

BLUE (MECH): The tank platoons will overwatch your initial movement into Brandenburg. Dismount your infantry at the intersection of Broadway and Main Streets. Immediately begin clearing the town. Split your platoon into sections and use your dismounts, overwatched by your vehicles, to clear both sides of Main Street simultaneously. Eliminate the sniper in the building on the southeast corner of the intersection of Decatur Street and Main Street. Continue to move north along Main Street, eliminating all other enemy resistance. Recover Bravo's wounded. I am attaching a medic vehicle to your platoon, and Black 5 will move with you for added firepower.

WHITE: Provide overwatch of OBJ WHITE by establishing an SBF position vic grid ET727059 oriented northeast into the town. After Blue (mech) has cleared up to Decatur Street, attack north behind the buildings on the west side of Main Street. Destroy the BMP vic grid ET731064 and attempt to find and destroy the other reported BMP.

BLACK 5: Move with Blue (mech), providing them with additional firepower as they clear the buildings along Main Street and as they clear the route. Coordinate with Black 7 for the CASEVAC of Bravo's wounded. Determine if Main Street is a trafficable route for follow-on forces.

FIST: Follow Red and set vic grid ET732063 oriented northwest to observe and adjust artillery and mortar fires to obscure enemy observation of Red's movement.

BLACK 7: On order, lead the M88 forward to recover Bravo's disabled vehicles on Main Street. Request additional M88 support from the Task Force. Supervise the CASEVAC of wounded Bravo soldiers. Request additional medic support from the Task Force as necessary.

SAPPERS: Move with Red and assist in clearing the lane for the follow-on forces.

I will move with Red and maintain command and control of all the moving pieces. I will coordinate with Alpha and Charlie and have them scan for the BMPs and T-80 that were reported close to their positions. It is essential that we maintain situational awareness during the execution of this mission. All guidons, keep me informed of your progress. Communication is our success.

RATIONALE:

The purpose of the company team's mission is to allow follow-on forces to establish a bridge site. The passage of follow-on forces within the allocated 1-hour time constraint hinges on our ability to establish a trafficable lane for the division to pass through. To conserve time, the company team can begin to pass follow-on forces without entirely clearing the town of Brandenburg as long as the main route is clear for the main body of the division. Initially, we must establish a temporary lane to allow passage of the division's lead elements. This provides the company team with enough time to remove the disabled vehicles from the main avenue of approach (Main Street), which will serve as the passage lane for the division's main body.

To accomplish this mission, the company team should conduct the operation in five phases IAW *FM 90-10-1 (An Infantryman's Guide to Combat in Built-Up Areas)*. After reconnoitering and moving to the objective, the company team isolates the objective, secures a foothold, and clears the built-up area prior to establishing the lane. Isolating the objective involves seizing terrain that dominates the area so that the enemy cannot supply or reinforce its defenders. This step must be accomplished concurrently with securing a foothold, which involves seizing an intermediate objective that provides cover from enemy fire and a place for attacking troops to enter the built-up area. A foothold is normally one or two city blocks. As the company team attacks to secure the foothold, it should be supported by suppressive fires and smoke.

To isolate the objective, I will employ my tank platoons in overwatch roles because of their firepower and their ability to acquire targets with their thermal sights. If my tank platoons are successful, the mechanized platoon's ability to clear the built-up area will be enhanced significantly.

I will use the mechanized platoon to clear the built-up area because of its greater maneuverability in restrictive terrain and its organic relationship with the platoon's dismounted infantry. Task organizing the mechanized assets within the tank platoons would prove to be too time-consuming; it is also doubtful that the tank platoon leader can employ dismounted soldiers with maximum efficiency. Therefore, I decided to keep my platoons pure.

The company team will have to clear the main avenue of approach to pass the majority of the division's assets. Due to the XO's support of Blue, the 1SG will be required to coordinate at the task force level for additional recovery and medic assets, which will assist in expediting the route clearance. Once Brandenburg is cleared and all disabled vehicles have been removed from Main Street, the company team will have created a passage lane capable of handling two-way traffic.

AUTHOR'S NOTE: We purposely reduced the unnecessary verbiage, staying away from a "perfect" schoolhouse solution that would be unrealistic in the heat of battle. Rather, we are providing the readers with a quick, realistic FM fragmentary order from the company team commander to his subordinates.

Reader Solution

(From First Lieutenant Rob Weber, B Co/USAARMC, Fort Knox, Ky.)

FRAGO:

"GUIDONS, this is Black 6, FRAGO follows.

Friendly Situation: Alpha has seized OBJ RED to our immediate West and Charlie has seized OBJ BLUE to our immediate East. Bravo attacked OBJ WHITE to our direct front. At the north end of town, six of their vehicles were destroyed by sniper and RPG fires that came from inside and around the buildings in that vicinity. Bravo has evacuated most of its casualties to CP 7; however, there are still a few dismounts pinned down in the area. Bravo has cleared and still occupies Buildings 1, 2, 20, 21, and 22.

Enemy Situation: Bravo 6 confirms the following enemy locations: RPG team Bldg. 13, SAPPER teams with small arms Bldgs. 10 and 16, suspected sniper Bldg. 4, a T-80 east of Bldg. 12, vicinity grid 732064, and a BMP north of Bldg. 13, vicinity grid 728064. Also expect another BMP somewhere in the town and other enemy occupied buildings, but cannot confirm exact locations. The enemy is armed with SAGGER missiles, antitank grenades, Molotov cocktails, and sniper rifle fire. They will attempt to destroy friendly units piecemeal as they move down the bottleneck streets of Brandenburg.

Mission: Team Delta attacks to seize OBJ WHITE in order to secure the crossing site on the south bank of the Ohio River vicinity grid 728066 and establish a SBF position to enable follow-on forces to establish a bridge site.

Intent: We will clear all buildings on OBJ WHITE and destroy all remaining enemy remnants. The endstate is the seizure of OBJ WHITE and the establishment of a SBF position oriented north across the Ohio River.

Tasks to subordinate units:

BLUE (mech): Detach Bravo section (minus dismounts) to Red (tank) and take Red's Bravo section. Move along Main Street and use your dismounts overwatched by your vehicles to clear Bldgs. 4, 16, 10, and 13 of reported enemy. Be advised, other enemy locations are possible as you move along the street. Collect any of Bravo's casualties that you encounter. Consolidate on the west side of the parking lot oriented NW. Assess whether or not we will be able to clear the vehicles off Main Street and use it as a trafficable route for follow-on forces. BREAK.

RED (tank): Detach Bravo section to Blue (mech) and take Blue's Bravo section. Move along Gay Street and turn west on Decatur Street to pass along the east side of Bldg. 7. Also take the engineer squad and clear a route behind the buildings on the east side of Main Street that can serve as a trafficable passage lane for follow-on forces in case we are unable to clear Main Street for through traffic. Consolidate on the east side of parking lot and orient NE. BREAK

WHITE (tank): Conduct a Passage of Lines with Charlie and quickly move along Gay Street until it intersects "River Road." Attack west along "River Road" and destroy the T-80 vicinity Bldg. 12. Continue your attack west to destroy the BMP vicinity Bldg. 13. You need to execute a timely move, destroy those two vehicles, and set on the south side of the parking lot oriented south. BREAK

Black 5: Follow in support of White and coordinate the passage of lines with Charlie. Keep me informed of your situation and give me warning prior to White's crossing of Main Street so I can lift fires. BREAK

Black 7: Take the trains to CP 9. Send the medic track with Blue to assist in the CASEVAC along Main Street. Coordinate with Charlie 7 for CSS support of White if necessary. On order conduct consolidation and reorganization activities in parking lot vicinity grid 731064. BREAK

FIST: Follow Red and locate in a position of good observation. Trigger artillery and mortar fires to provide smoke to obscure enemy observation of Red's and White's movement. BREAK

I will move with Red and maintain command and control. I will coordinate with Charlie and Alpha and have them scan for the T-80 and BMPs as their reported locations are close to their respective positions. It is essential that we maintain situational awareness, so keep me informed of progress. When White assaults west across the north side of the OBJ, I will instruct Red and Blue to lift and shift fires to prevent fratricide.

Alpha 6, be advised there is a reported BMP north of Bldg. 13 to your NE. You should be able to observe and engage him at this time. BREAK

Charlie 6, be advised there is a reported T-80 east of Bldg. 12 to your NW. You should be able to observe and engage him at this time. OVER.

RATIONALE:

My primary mission is to ensure that the division's follow-on forces can establish the bridge site and continue the attack. Therefore, I must create a trafficable lane for their passage. In addition, I must also clear OBJ WHITE and CASEVAC Bravo's wounded soldiers. I have task organized my platoons in the following manner:

(Red and Blue, two tanks and two BFVs; White, 4 tanks). I did this in order to provide the element clearing the town with the added firepower of the tanks. In addition, I left the dismounts of the Bradley section that went to Red behind with Blue (mech) for use in clearing the buildings of Brandenburg. White remained tank pure in order to maximize its firepower as it is my primary killing element.

I have used Red to clear a lane behind the buildings on the east side of Main Street to be used in case the disabled vehicles on Main Street cannot be removed prior to the arrival of the division's forces. I have provided Red with the engineer squad to assist them in establishing a lane. I am using the infantry dismounts to clear the buildings in the town of Brandenburg. They are supported with a tank section to provide overwatch and additional firepower and the medic track to assist in the CASEVAC of Bravo's wounded. I have also tasked Blue (mech) with determining whether Main Street can be used as a trafficable route. I have sent White, along with the XO, to conduct a passage of lines with Charlie in the east in order to conduct an attack at the north end of Brandenburg. By attacking east to west, I hope to achieve advantage by hitting the enemy (T-80 and BMPs) from their flanks or rear. I anticipate that these enemy vehicles will be primarily orienting south into the town of Brandenburg. Also, I have attempted to crosstalk with other elements in the task force by informing Alpha and Charlie of the enemy vehicles reported near their locations. If Alpha and Charlie would be able to engage these vehicles, I would have more assets available to accomplish my mission of establishing a lane and clearing Brandenburg. I have used the FIST to provide smoke in order to obscure enemy observation of Red's and White's movement.

I have incorporated a redundancy by providing two alternatives for the passage lane for the division's assets. First, I will attempt to use Main Street as the primary route. However, if Main Street cannot be cleared of enemy resistance or disabled Bravo vehicles cannot be removed, I have provided an alternative route on the eastern side of town. Due to the difficult task organization and the independent maneuver of each platoon, my plan requires a well-trained unit. However, good communication will lead to the commander's ability to maintain command and control and a successful mission.

Exploiting Precision Maneuver

An Experiment to Evaluate M1A2 Tactics, Techniques and Procedures

Prepared by PLT/CO/TM Branch, Doctrine Division, Directorate of Training and Doctrine Development

The United States Army is investing heavily in modernizing and "digitizing" its heavy forces. This follows the clear assumption that such an investment will pay off in forces that are far more capable than the Army that won the Gulf War. Much thought and discussion has revolved around the capabilities of UAVs, long-range precision artillery, and proliferating sensors that enable us to hit a target with smart weapons. The Army clearly is focused on the operational impact of these systems. At the same time, however, not as much thought or analysis has gone into how all of this impacts conditions at the point of the spear. How will the digital capabilities of modern tanks and Bradleys change the way companies and platoons fight?

Observations at the NTC and Fort Hood might lead to a simple conclusion — not much. People who watch training at these sites often comment that, although digitization is changing the way things happen in JANUS computers, our tank platoons and company teams pretty much do things the way they have done them for 20 years. Indeed, a bit of research on tactical doctrine reveals that doctrine has not changed the way we operate much. Our field manuals (FMs) and mission training plans (MTPs) promulgate essentially the same tactics today that they did in the early '70s — when the overwatch principle was introduced and the most modern tank we had was the M60A1 (and some RC units still had the M48).

Shouldn't we be doing things differently at platoon level today than we have over the past 20 years? One suspects that if all these digits are really to help us, then the answer ought to be a resounding "yes." Recently, the Directorate of Training and Doctrine Development at the Armor Center decided to conduct some experiments to find out how to do it.

Experimentation

Overview. With the full cooperation and support of the MMBL and SIM-NET/CCTT, the Platoon/Company Team Doctrine Branch of DTDD conducted constructive and virtual testing of the M1A2 from 1-23 April 1998. The experimental exercises were designed to provide analytical insights useful in deployment of the M1A2. The testing also examined various tactics, techniques, and procedures (TTP) that can exploit the enhanced mobility, lethality, and survivability of the M1A2 at the platoon and company levels. Results of the experiment will be used in development of *FKSM 3-71-1D*. This manual will serve as a bridge between the "analog" manuals that we are currently producing and the next wave of manuals that will be aimed at supporting the digital force. The manual will also update our lowest-level tactics to fit modern combat systems of significantly increased capability.

Background. The 1st Cavalry Division at Fort Hood, the first U.S. Army unit equipped with the M1A2, identified critical doctrinal shortcomings of TTPs available for this tank. These units cannot take full advantage of the enhanced capabilities of the new platform using the old TTPs.

Focus. The experimental focus was on two parameters: movement techniques and size of battlespace for the platoon and company team. We were looking to answer the following questions:

Based on the enhanced target acquisition capabilities of the CITV, and on the C2 capabilities afforded by the IVIS, can the tank platoon's frontage increase beyond the current doctrinal limit of 500 meters?

Given the enhanced target acquisition, situational awareness, fire control stabilization, and survivability of the M1A2, does the deliberate process of bounding overwatch become obsolete?

Testing

The following paragraphs summarize the results of the experiments conducted at Fort Knox.

Constructive Testing. A total of 47 cases were run using the Battlefield Environment Weapon System Simulation (BEWSS) model in the Interactive Distributed Engineering Evaluation and Analysis Simulation (IDEEAS) synthetic environment. A matrix of 10 runs was executed for the M1A1 tank as a baseline comparison; the remaining tests were made using the M1A2 tank. Several parameters were varied to assist in evaluating new TTPs. These parameters included the following:

- Two terrain data bases: Germany and Southwest Asia (SWA).

- Variable vehicle dispersion distances for both movement to contact (MTC) and defense missions: 100, 250, and 500 meters in SWA and 100, 200, and 300 meters in Germany.

- In the defense, three types of defilade positions: hasty, hull-down, and turret-down.

- In the offense, three types of offensive TTP options (illustrated in Figure 1):

Option 1 – current TTPs. This option entailed use of current doctrine and TTPs.

Option 2 – travel to contact. In this option, the company team used the traveling movement technique until contact was made. It then transitioned to fire and
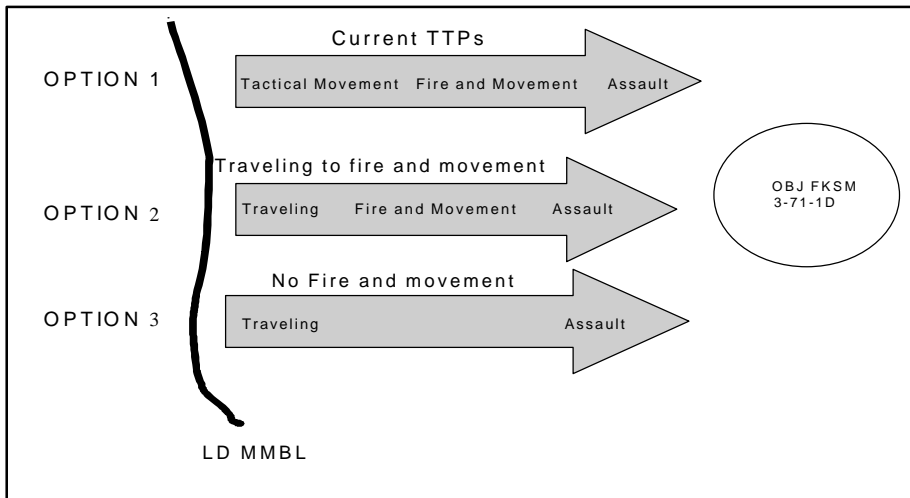
Figure 1. Offensive options in constructive testing.

movement, employing bounding overwatch. This option makes the traveling overwatch technique obsolete. Bounding overwatch is used only after enemy contact is made.

Option 3 – no fire and movement. The company team used the traveling technique, then transitioned directly to the assault upon enemy contact. The team did not execute fire and movement, instead orienting weapons on the enemy and firing on the move. This technique, which acquired the nickname "drive-by tactics," is discussed further in the "Conclusions" section of this article.

Each case or combination of these parameters was run for 20 iterations. Each case was then compared using average loss exchange ratios (LER). Each LER is in terms of one friendly vehicle.

Insights in Constructive Testing

OFFENSE

SWA: Options 2 and 3 are significantly better than Option 1; 100m dispersion is slightly better than 250m.

Germany: Option 1 is significantly better than Option 3. Option 1 has only slightly higher LERs than Option 1 in the German terrain. There is no significant difference among the three frontages.

DEFENSE

SWA: Turret-down is significantly better than hasty defense and somewhat better than hull-down. The 100m dispersion is significantly better than the 250m and 500m dispersions.

Germany: Turret-down is significantly better than both hasty and hull-down positions. Also, hull-down is significantly better than hasty positions. There is no significant difference among the three frontages.

Virtual Testing. Using the four M1A2 CCTT simulators at the SIMNET building, with 12 personnel from DTDD and MMBL and four from 16th Cav, we conducted platoon exercises to explore our parameters. After three days of station training and practical exercises and two days of trial runs and internal platoon SOP development, we began running missions. We conducted platoon missions as a part of company/team-level operations where the other two platoons were Modular Semi-Automated Forces (MOD-SAF) platoons (one tank and one mech), all controlled by one "Black 6" OC. We ran four missions a day and collected SME observations and insights through AARs. We ran five days of movement to contact (MTC) and three days of defense, all on the NTC terrain data base.

Insights in Virtual Testing

OFFENSE

Option 2, with up to 250m dispersion (METT-TC dependent), proved most successful.

Dispersion of 500m made formations difficult and reaction times longer on battle drills.

During contact, reporting should be by FM first, with follow-up by the appropriate digital report as time permits.

The loader must assist the TC with maneuver of the tank while TC is "down" using IVIS/CITV.

Crews were less effective when forced to fight their tanks buttoned up. However, they were able to fight open protected almost as well as open while in the simulator.

Platoons failed to successfully execute offensive missions when required to fight buttoned up and send digital messages over IVIS during contact.

DEFENSE

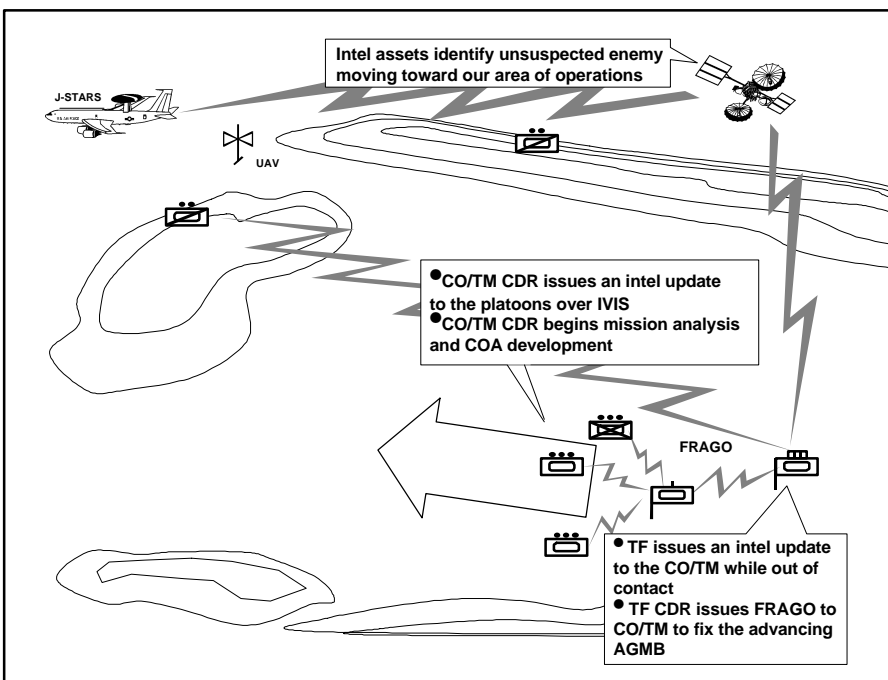Dispersion between vehicles up to 250m (depending on METT-TC) proved most successful.

Figure 2. Company team receives intelligence and orders.

More than 250m between vehicles made it difficult to maintain mutual support and overlapping fields of fire, preventing the platoon from being able to mass fires on the enemy.

The M1A2's dual target acquisition capabilities, including CITV, were extremely effective.

The 3,000m trigger line was very successful.

Digital reporting may be used more in the defense than in the offense; SITREPs proved useful for reporting logistics status to the platoon sergeant.

When displacing or repositioning, TCs preferred to go open hatch; otherwise, they could fight open protected or buttoned up just as effectively as open.

Dismounted observation posts (OP) are no longer necessary because of the CITV; however, dismounted listening posts (LP) may still be useful depending on METT-TC.

Digital sector sketches proved an efficient way to get useful information to the platoon leader for use in development of the platoon fire plan.

Conclusions

We believe that the results of our experiments contain important implications for the heavy force and the way it should fight during the next decade. We set out to see if the M1A2-based armored unit should fight differently from the way its M60 (or even M48!) forebears did. To be honest, we expected to find that our digitized and modernized units would, with almost no exception, use very different TTPs. Many of our results did indeed bear out this assumption. Some, however, surprised us. In many ways, the M1A2 platoon and company team should fight in much the same manner as older units. In other situations and conditions, our modernized forces can fight very differently indeed, exploiting situational awareness and the capabilities of their modernized systems to be a far more agile and lethal combined arms team. The M1A2 can be the agent for bringing true precision maneuver to the battlefield.

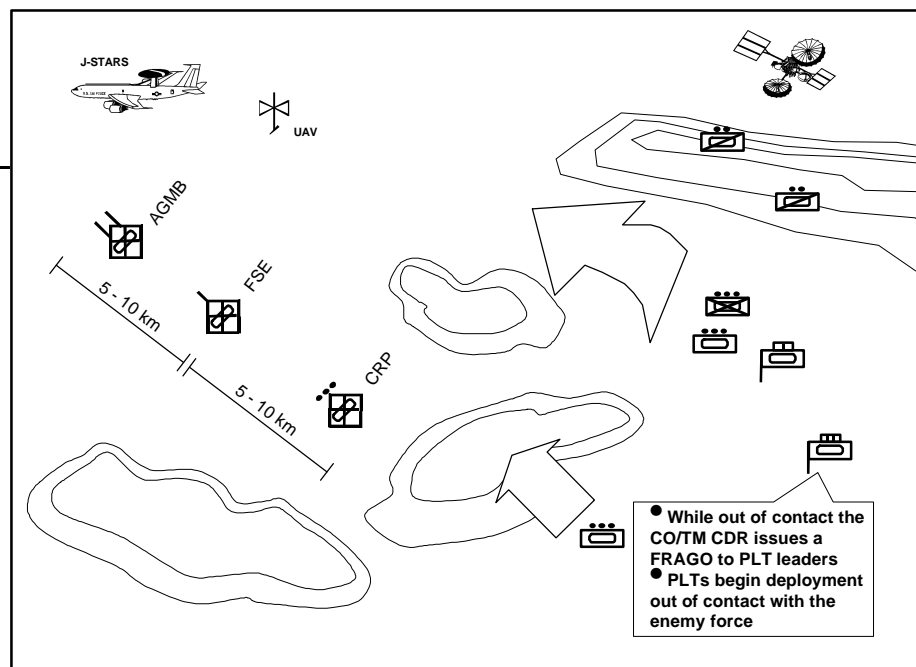**Traditional Tactics Apply.** Our first conclusion reinforces traditional tactical principles. In direct fire combat against an identified enemy, the attacking force should establish a base of fire with one part of its force and maneuver to a position of advantage over the enemy with another. Our experimenters tried different ways of "rushing" the enemy while trying to exploit the ability of an M1A2 to acquire the enemy and fire on the move. Nicknamed "drive-by tactics" by our experimenters, these invariably resulted in higher casualties or even mission failure. Rather, it was the tactics of fire and movement — one element covering the advance of another with fire — that most often led to success with minimum casualties. This is not to suggest, of course, that the M1A2's formidable abilities to move and shoot are superfluous. A maneuvering element should fire when it can. Further, although situational awareness provides unprecedented knowledge of the enemy, chance contact cannot be entirely eliminated, especially in relatively restricted terrain. Thus, reacting to contact will always be an important tactical task, and one at which the M1A2 excels. Finally, even (or perhaps especially) in armored combat, morale and shock effect are still of crucial importance. The psychological effect of seeing a company of tanks on line, advancing at speed and firing on the move, should not be underestimated. Our virtual and constructive experiments could not adequately portray this. Certainly, against a shaken or weak enemy, this remains a valid tactic. An additional benefit is that the M1A2 is devastating in the base of fire or overwatch role.

Our experiments demonstrated clearly the tremendous combat multiplier effect of the commander's independent thermal viewer (CITV). The ability of an "A2" platoon to acquire, engage, and kill multiple targets far exceeds that of previous systems. Thus, while the M1A2 may most often use traditional tactics in direct fire combat, it will be far more capable than previous tanks of executing these tactics to devastating effect.

Voice Commo Is Still Needed. Our second conclusion surprised no one. Digitized units will communicate digitally before the direct fire fight, but once close combat with the enemy begins, voice communications rule. Digital communications are too cumbersome for the heat of the direct fire battle. We do not see this changing in the foreseeable future, no matter how "user friendly" digital devices become. We plan to make the principle of "digital communications during the approach, voice commo during the fight" a doctrinal tenet.

Some Changes Are Small (But Distinct). Our experimenters also came to some interesting "how to fight" lessons learned regarding the M1A2 tank itself. These observations suggest that some changes and improvements to our capabilities are incremental, rather than truly dramatic, in nature.

First, and most important, the duties of the loader increase substantially — especially those on the platoon leader's and company commander's tank. With the commander busy with the CITV or FBCB2, it often fell to the loader to keep

Figure 3. Company team deploys.

his head up, watching the rest of the unit to maintain formation. In some situations, he even had to guide the tank from one place to another or was required to participate actively in keeping tank movements safe.

Second, in the defense, TCs almost always fought from their CITV (except when moving), while in the offense the most popular choice was fighting from the "open protected" position. Unfortunately, the M1A2's design prevents the use of the .50 caliber from the open protected position, a distinct disadvantage.

Finally, in the defense, the use of OPs proved unnecessary, although the crews felt that LPs are still important in certain situations.

Battlespace Expands. A key difference in the way M1A2 units fight is an increase in the size of the battlespace they can influence mainly as a result of the dual target acquisition capabilities of the CITV. For example, dispersion between vehicles can increase up to 250 meters. Unit frontages can increase as well. Platoon frontages will grow up to 1,000 meters, and company frontages up to 3,000 meters (all figures are METT-TC dependent). While increasing the size of the area the tank unit can cover, however, expanded battlespace will stretch the unit's logistical resources in terms of CASEVAC, resupply, and maintenance.

Movement Techniques Change. Probably the major difference revealed by our experiments is in the way M1A2 units approach the enemy. Situational awareness made the use of "traveling overwatch" unnecessary and reduced the use of "bounding overwatch" to situations in which the unit is in very close proximity to the enemy. Units would employ the "traveling" movement technique to move quickly to the enemy's location and then attack him. Normally this movement would be in a practiced formation, allowing more effective control and reaction. During this rapid approach, platoon leaders and the company commander could sketch out and disseminate a rough plan to the unit using the FBCB2; the plan would describe how the unit would execute the attack upon reaching the enemy. In our experiments, this technique enabled the unit to rapidly finish off the enemy with fewer casualties. These quick-moving formations could also be more dispersed than in pre-
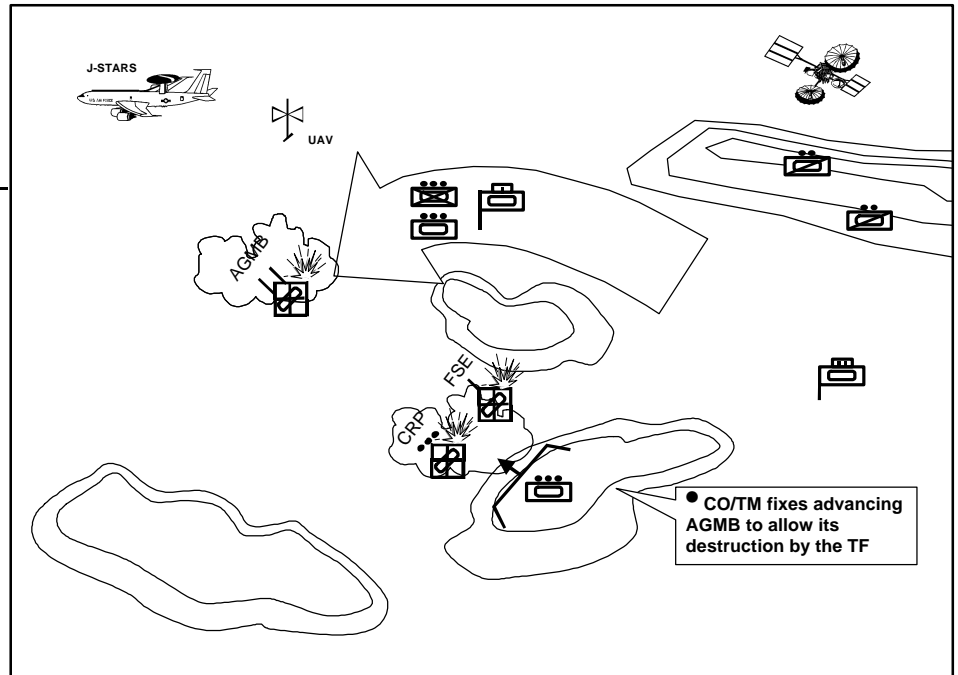

Figure 4. Company team fixes enemy's AGMB.

vious experience. Situational awareness, coupled with enhanced target acquisition capability, enabled platoons to occupy wider frontages and to control more terrain. Defensively, this obviously means that digital/modernized units can defend more territory. It is the offensive implications, however, that may be more important. The demonstrated ability to move rapidly in dispersed formations to critical battlefield locations, and then to strike the enemy with an overwhelming blow and finish him before he can react, is a finding of major importance. Figure 2 through Figure 4 illustrate this capability.

A Final Word

It is important to remember that the experimenters in our M1A2 tests were not bookish maneuver warfare theorists. They had no agenda other than to keep trying different tactical techniques until they found what worked.

What worked was something akin to what TRADOC thinkers are calling "precision maneuver." The modernized and digitized force seems in this experiment to represent an offensive striking force of great power. Having gained information dominance, and guided by excellent friendly and enemy situational awareness, this force can move quickly to the critical points on a nonlinear battlefield, where relatively small forces maneuver over and control great areas. Moving dispersed, these formations create a target that is difficult for the enemy to see and mass his combat power against. Further, they

can move at unprecedented speed, relatively (but not entirely) free from fear of chance major contact or ambush. Once at the critical locale, these units can employ direct and indirect fires with tremendous effect, achieve a decision, and be prepared to move to the next critical spot.

This represents a different manner of fighting than the linear breakthroughs and exploitations to which we are accustomed. It is perhaps reminiscent of the type of fast-moving, hard-hitting cavalry operations of Nathan Bedford Forrest and James H. Wilson during the American Civil War. It is important to remember, however, that to realize fully the awesome capability of modern digitized equipment, units must develop, and then implement, a high-quality training program. Our experimenters benefited from repetitive practice, and one obvious assumption is that they could not have demonstrated the agility and lethality that they showed without having reached a very high level of proficiency. And this was a simulation — real life and its fog of war is undoubtedly more difficult. Digitization and modernization provide only potential. The Army of tomorrow will require superbly prepared and extensively practiced soldiers to reap the benefits of this revolutionary promise.

Altitude Separation at the National Training Center

A Method for Deconflicting Indirect Fires and Close Air Support

by Major Christopher Irrig

Deconflicting indirect fires with Close Air Support (CAS) attacks is a difficult task to accomplish at the National Training Center (NTC). Historically, rotational units exhibit a lack of understanding in using altitude separation which has resulted in poor execution of simultaneous CAS and artillery attacks. This lack of Tactics, Techniques, and Procedures (TTP) is not entirely a unit's fault, as there exists a lack of TTP between the Army and the Air Force. *Joint Pub 3-09.3, Joint Tactics, Techniques, and Procedures for CAS* is a valuable publication but doesn't provide specific techniques for control and computational procedures necessary for artillerymen and the Tactical Air Control Parties to utilize in safely deconflicting artillery fires with CAS attacks. The NTC's Live Fire Team (Dragons) has aggressively pursued TTPs that will reverse these trends that units routinely exhibit. This article is intended to identify evolving trends with altitude separation.

In March 1997, NTC's Operations Group and the USAF Air Warrior staff revised the CAS rules of engagement (ROE) to include a third method to deconflict CAS and artillery fires. This method is called Altitude Separation and the procedure includes both lateral and altitude/vertical separation control measures. This method provides the brigade commander and his task force commanders the ability to mass CAS and artillery fires simultaneously on the same target or nearby separate targets.

In order to attack the same target simultaneously with CAS and artillery, we use a procedure called "ORD 1." This procedure refers to the altitude of the artillery trajectory one kilometer short of the target. ORD 1 is calculated, using artillery firing tables, to ensure fighters stay above (SA) the artillery fragmentation and artillery trajectories at the target area.

During simultaneously separate target attacks with CAS and artillery, we use a procedure called "MAX ORD + 1000 FT." If the fighters must cross an artillery gun target line (GTL), short of the artillery target area, then the FSO/ALO will restrict the aircraft above the maximum

ordinate + 1,000 feet. In order to derive the maximum ordinate, the artillery fire direction center (FDC) must report the maximum ordinate for the target they will fire. Add a 1,000 feet vertical buffer to it, and pass this altitude as the minimum SA altitude at mean sea level (MSL) to the pilot. These two gunnery computational procedures ORD 1 and MAX ORD +1,000 FT clearly determine the minimum safe SA altitudes for fighters during a specific target attack. Time and lateral separation procedures are still valid methods for some types of attacks, but they do not enable commanders to mass assets simultaneously. Altitude separation is simply another option and not the "sil-

ver bullet" for rotational units' CAS problems, nor is it appropriate for all types of CAS employment options. Commanders, based upon the tactical situation, may decide to use another method other than altitude separation.

During the Leader's Training Program (LTP) conducted at the NTC prior to the unit's rotation, the brigade commander and his key leaders receive a briefing on altitude separation TTP and rules of engagement (ROE). Immediately following the briefing, the Brigade/Task Force Fire Support Officers (FSOs) and Air Liaison Officers (ALOs) are taught a class and then given the opportunity to work

through several practical exercises in order to reinforce their understanding of the procedures. This process began in March 1997 with the revision of the CAS ROE, and every brigade commander that has received this Leaders Training Program class has decided to use this method. Once the brigade commander has decided to implement this procedure, the brigade must develop, train upon, and rehearse their Standard Operating Procedure (SOP) during their train up at home station. During force on force operations, the unit can continue to refine its procedures.

When the brigade transitions to live fire operations, the Commander of Operations Group (COG), the brigade commander, and the appropriate O/C Team Senior Trainers (07s) conduct a risk assessment. Based upon this assessment the unit may decide whether or not to use the altitude separation TTP during live fire operations.

June 1997 was the first time that altitude separation TTPs were executed in a live fire exercise. The brigade's mission was to conduct a deliberate attack with a Line of Departure (LD) time of 0700. The brigade commander's guidance was to shoot artillery-delivered smoke at the point of penetration (POP) and simultaneously engage the Motorized Rifle Company (MRC) at the POP with CAS. The Forward Air Controller-Airborne (FAC-A) was on station at 0730, and the first sorties were available at 0800. The FAC-A developed the tactical situation, received the safe SA altitude from the brigade FSE, and passed the 9-line briefing and target identification to the fighters. The fighters identified the target and were cleared hot from the FAC-A. Having set the conditions for a simultaneous attack, the brigade's field artillery then executed its first essential task (providing obscuration smoke at the POP) while the fighters dropped their ordnance on the MRC. As the CAS target was approximately 300 meters northeast of the artillery-delivered smoke, the two A-10s were able to deliver a total of six MK-82s on the MRC by using the smoke as a reference.

This successful simultaneous attack on the target was a preplanned mission. The brigade FSO and ALO developed the plan based upon their commander's intent, availability of aircraft from the Air Tasking Order (ATO), and the scheme of maneuver. This attack was briefed at the OPORD and practiced during the brigade combined arms rehearsal, which ensured complete dissemination throughout the brigade. The attack plan was further refined and rehearsed throughout the direct support field artillery battalion's fire direction centers.

During another rotation, a brigade exhibited proficiency using the altitude separation technique during force on force operations. However, during the live fire offense FAC-A aircraft were not available to the brigade. The COLT/ETAC observation plan did not compensate for loss of FAC-A support by positioning them far enough forward to observe and control the air strikes, resulting in the unit having difficulty in synchronizing their attack. When CAS was on station, the ETACs were not in a position to provide direct control of the aircraft and the fighters were not cleared hot from the initial point (IP) to the CAS target. The ETAC's displacement criteria, movement triggers, and subsequent positions need to be well thought out in relation to where units expect to employ CAS.

As a trend, TF-level ETAC teams rarely get the opportunity to direct CAS attacks, and this attack provided a perfect opportunity to hand off the CAS from the BALO to the lead TF. Despite the fact that the majority of CAS attacks at the NTC are executed at the brigade level with FAC-A aircraft providing "direct control," TFs must still have ETAC positioning plans that support the commander's intent in case the aforementioned situation occurs.

The next unit had difficulty establishing informal ACAs that would support simultaneous artillery missions and CAS attacks. In some cases, the ACAs were too large and covered a great deal of the area of operations, thus preventing the artillery from engaging targets. Eventually, the FDC had to cancel some of the informal ACAs in order to engage these targets with artillery fires. This caused problems with both air and ground terminal controllers who were not aware of the changes in the informal ACAs, resulting in aborting aircraft due to the confusion over which ACA was active. Some fighter pilots were aware of the current ACA, but spotted artillery rounds impacting inside of it and aborted their CAS attack. The pilots were either not aware and/or did not fully understand that the brigade was using the ORD #1 procedure to deconflict CAS and artillery attacks.

During the deliberate attack missions units tend to use altitude separation with preplanned CAS. When the preplanned CAS requests DD 1972 are approved and aircraft sorties and time on station are confirmed based upon the ATO, this enables units to rehearse their plans early on during the brigade combined rehearsal.

As units develop confidence in altitude separation procedures, then immediate CAS will be routinely executed this way at brigade and TF level. Eventually, NTC Operations Group and Air Warrior staff will develop the stay below (SB) altitude procedures with the necessary ROE and give the brigades the option to use it. The U.S. Marine Corps has used altitude separation for years and routinely trains to fly below the gun target line at its Air-Ground Combat Center at Twenty-Nine Palms, Calif.

This altitude separation TTP is now incorporated into the Field Artillery Officer Advance Courses for future BDE/TF fire support officers and fire direction officers. This method is clearly a step in the right direction in terms of bridging the gap in altitude separation TTP between the Army and the Air Force. The Air Land Sea Application (ALSA) Center is working to develop a JTTP handbook for ALO, FAC, ETAC, FSOs, S3, and commanders. This handbook will help all services in terms of joint commonality and interoperability. The Air Ground Operations School (AGOS) at Nellis AFB has incorporated this TTP into their POI for future classes. Further down the road, the AF believes that this may be a viable candidate for Tactics Test Review Board consideration as a TD&E test and inclusion in AFTTP 3-1. This TTP is a proven, safe, quick, and effective technique for deconflicting simultaneous CAS and artillery attacks.

MAJ Chris Irrig, a field artillery officer, is currently attending the Navy Command and Staff College at Newport, R.I. He served at the NTC for 34 rotations, including assignments as firing battery trainer, TF live fire FSO trainer, and, most recently, as brigade live fire FSO trainer. During live fire operations, he deconflicted surface danger zones (SDZs) for all direct fire weapon systems, and additionally, cleared all indirect fire missions and deconflicted simultaneous CAS and artillery attacks. He commanded battery Delta, the "Alexander Hamilton" battery with 1st Battalion, 5th Field Artillery at Ft. Riley, Kan.

Korea, Vietnam, And Desert Storm

by Lieutenant Colonel Kris P. Thompson

M48 of the 34th Armor busts jungle in Vietnam.

After the refinement of mobile warfare in WWII, all nations in the civilized world breathed a collective sigh of relief and proceeded to dismantle their military forces. National will, eroded by costly world wars in two successive generations, caused a loss of priority, resources, and public support in the U.S. armed forces. In the midst of this degenerative period, the Army was asked to fight two undeclared wars.

Korea – Constrained by Terrain

The failure to properly employ mobile units in both Korea and Vietnam serves as an example that an army can make the same mistake in two consecutive conflicts. Armor was helpful to the infantry in Korea, but was not employed in enough numbers to be a campaign winner. The armored units which were sent to Korea were broken up and employed by platoon or company the vast majority of the time. Even the breakout from Pusan in September 1950 — which could have and should have been a great opportunity for a blitzkrieg or COBRA-type breakout — was characterized by small armored task forces leading (mostly) motorized infantry divisions up mobility corridors. After a delayed breakthrough on the Naktong Line, MG Hobart Gay, commander of the 1st Cavalry Division, said "From now on, it's a tank battle."[1] Wishful thinking.

The spearhead of the Pusan breakout was Task Force Lynch, consisting of the 70th Tank Battalion and 3/7th Cavalry. Hardly the concentration of mobile forces one would hope for to make a operational level exploitation and pursuit. Three days after TF Lynch began operations, General Walton Walker, commander of the Eighth Army, formed two other armor task forces hoping for a COBRA type breakout. It was not to be.

TF Lynch provides examples of the variety of problems faced by mobile combat units during the Korean War. The first problem was that the mission of TF Lynch was to link up with the Inchon invasion force, in furtherance of Eighth Army's mission statement — which was to pressure the North Koreans to their front, preventing them from moving north to defend Seoul, and to link up with the invasion forces. This was not an inspired concept, as it did not contain a defeat mechanism, nor did it result in decisively winning a campaign.

MacArthur intended for the Seoul invasion forces to "cut the enemy's supply line and seal off the entire southern peninsula."[2] Only the first part of this purpose was accomplished. The problem here was that the vast majority of the few available mobile forces were not assigned to the enveloping force landing at Inchon, but instead they were with the direct pressure force, the Eighth Army, inside the Pusan perimeter. There is no doubt the Inchon invasion was highly effective in many respects. It cut the North Korean supply routes through Seoul, captured the largest airfield in the country, and had great psychological effect on both sides. But the failure to seal off the peninsula allowed large numbers of North Koreans to retreat northward, prolonging the war until the Chinese could intervene.

The main problem, of course, was lack of mass. The final linkup was accomplished by TF Lynch after a hard firefight just south of Seoul. That was it. No sweeping movements across the enemy rear. No overrunning of enemy command posts and supply bases. No blocking of enemy retreat routes. No destruction of enemy artillery units. It sounded good in the press but, in reality, it did not have much effect at the operational level.

Vietnam - Operational Chaos

Because of the experience with Pacific rim terrain in Korea, and the unfortunate results of the French in Indochina, planners for the Vietnam War initially ignored armored forces. Engineers completed an early terrain analysis which was very conservative in labeling GO - NO GO terrain. This stands in marked contrast to the Germans having Heinz Guderian, an armored officer, personally certify the Ardennes as trafficable for the 1940 campaign. In 1967, revised terrain studies indicated that armor could move cross country through the majority of South Vietnam. Battlefield experiences verified the decisiveness of armor in close combat, and the deployment of armor to Vietnam steadily increased between 1966-1970. By 1970, 46 percent of the combat troops were armored battalions.[3] This rose to 54 percent in 1971.

A new type of platform for mobile warfare came to fruition in Vietnam — the helicopter. Initially, helicopters were used

primarily as transports, but their tactical effectiveness led to innovative, aggressive development of many other ways to employ them. Because of their high value, both armor and aviation units found themselves being broken up and employed piecemeal. Better motor and suspension technology for tracked vehicles, along with the increased mobility of supporting aviation assets, gave mobile combat units even greater speed of movement than in WWII. 3d Squadron/11th Armored Cavalry Regiment (ACR) moved 200 miles in two days in order to be at the line of departure for the attacks into Cambodia in May 1970 during Operation Toang Thang 43. This particular operation illustrates the problems caused by piecemeal commitment and indecisiveness at the operational level.

The purpose of the operation was to attack enemy sanctuaries in Cambodia, which had been previously off limits. U.S. forces involved in the operation included 1st Cavalry Division (Air Assault), 25th Division, and the 11th ACR. Brilliant use of aviation and armor in mobile warfare led to success at the tactical level. Surprised enemy units were encircled and annihilated. Huge stocks of individual weapons, crew-served weapons, ammunition, and rice were captured. The penetrating forces overran an extensive logistics base with a fully equipped motor park, complete with grease racks and spare parts.[4] The 11th ACR was assigned two additional engineer companies to handle all the added demolition work. By the end of the operation, almost 10,000 tons of materiel and food had been destroyed and over 11,000 enemy soldiers killed.

Not all went well, though. One armor battalion had to be withdrawn after only a few days in the fight. This was in large part due to the piecemeal employment of the battalion previously with resulting logistical breakdowns. And, in the midst of this devastation on the enemy base of operations, President Nixon declared he was satisfied with the results and that American forces would be pulled out of Cambodia within 7 weeks. This prevented the operation from having decisive effect at the operational level. The value of the operation was to provide time for the South Vietnamese forces to build up and the U.S. forces to continue redeployment out of Vietnam — important, but certainly not a campaign winner.

We all remember the post-Vietnam era as the lowest point for mobile warfare since the early '30s. Everyone thought the tank was a "has-been." The '73 Arab-Israeli war supposedly proved that the ATGM was now the dominant tactical weapon. The artillery arm and the Air Force were still claiming they could win a war by themselves with new technology. Light infantry tactics were the "in" thing. Grenada and Panama were touted as the blueprints for all future conflicts.

There was constant pressure to conduct simulations, experiments, and studies on how to make the armor force relevant in a low intensity, light infantry fight.[5] The light cavalry regiment, AGS, and light/heavy concepts were the hot, current ideas. We felt we were on the verge of being ignored out of existence.

Desert Storm

When older veterans compare Korea, Vietnam, and Desert Storm, the difficulty and desperateness of the close fighting in Korea and Vietnam sometimes tend to cause them to mitigate the magnificent success of mobile forces in Desert Storm. Yet the result of Desert Storm and the resulting low casualty rate is a strong indication that the use of mobile forces in this campaign was of a very high order — by far the best use of mobile forces in the United States Army since the invention of the tank.

Because Saddam Hussein and the Iraqi senior leaders exercised very centralized control, the theater CINC, General Norman Schwarzkopf, felt Hussein's national communications facilities were a center of gravity. He also felt the Republican Guard, as the heart and soul of the Army, was its center of gravity. Destruction of the Republican Guard would leave Hussein without a means of enforcing his will — and, as a result, national will would quickly deteriorate. Thus, the target of the mobile forces was the Republican Guard. This is somewhat reminiscent of Sheridan's first attack against Stuart's cavalry. But there is an important distinction between the two, as Stuart's cavalry was not a center of gravity, while the Republican Guard certainly was. Schwarzkopf's method was a four-phased plan:

- Disrupt enemy command and control with air/smart weapons power;

- Gain air superiority;

- Cut enemy supply lines with air/smart weapons;

- Destroy the Republican Guard.[6]

The concept involved massing of mobile forces, surprise, indirect approach, and destruction of the enemy center of gravity.

First, despite doubts as to whether surprise was feasible in the information age, both the fact of the attack and the location of the attack were totally unexpected by the Iraqis. Schwartzkopf intentionally waited until the air campaign had stopped Iraqi reconnaissance flights to displace VII Corps and XVIII Airborne Corps to the west. This prevented the Iraqis from detecting the movement.[7] The lack of a road net in the intended area of attack probably also led the Iraqis to discount the chances of an envelopment from the west.

Second, the plan called for an unprecedented massing of mobile forces in the main effort. To put things in perspective, in VII Corps — the main effort — General Franks commanded over 1,200 M1 series tanks, 1,400 Bradley Fighting Vehicles in US formations, as well as the 1st (UK) Armoured Division. This represented over 3,000 armored fighting vehicles — more than the entire German Wehrmacht fielded on the Western Front in 1940, and more than were in Patton's Third Army. In addition, XVIII Airborne Corps (paired with VII Corps in the envelopment) had a mechanized division, a light armored division, a light (motorized) division, and an air assault division. Since they were on the outside arc of the turning movement, it made sense for this corps to have predominantly lighter, faster units.

The maneuver concept for Desert Storm, according to General Fred Franks, came from General Colin Powell, who sketched the scheme of maneuver on hotel stationary for General Norman Schwartzkopf.[8] This episode somehow did not find its way into Schwartzkopf's book, where Schwarzkopf takes credit for the idea.[9] The scheme of maneuver called for the mobile forces in VII and XVIII Airborne Corps to envelop the Iraqi forces by moving through the lightly defended inland positions. This allowed the two corps to move around the main Iraqi linear positions along the Kuwait-Saudi border and into the Iraqi rear towards their main target — the Republican Guard. They avoided the strongly held enemy positions between their launch point and their objective. This put them into the enemy rear areas quickly, before the enemy could react.

The speed of the movement into the enemy rear was unparalleled. VII Corps attacked 170 miles in 89 hours — or about 45 miles a day.[10] One unit, 1st

Cavalry Division, moved almost 150 miles in one day during the attack. The 24th Infantry Division (Mech) probably moved further than any other division. It moved sixty miles into Iraq on the first day alone. These units moved at this incredible speed through sandstorms, rain, and the Republican Guard. And this, while each armored division was consuming 500,000 - 750,000 gallons of fuel per day.[11] This rate is comparable to the daily consumption of First and Third U.S. Armies in WWII of 850,000 for all 18 of their divisions combined. The corps as a whole consumed 6.2 million gallons of diesel fuel and 2.2 gallons of aviation fuel in 89 hours.[12]

Projecting Into the Future

In 1936, the new French Chief of Staff, General Gamelin, smugly asserted, "All our information shows that it is our doctrine [as compared to the German panzer doctrine] which is correct."[13] Gamelin's smugness was based on the doctrine of defense, continuous front, containment, and fortification which had proved successful in WWI. Yet, only four years later, Gamelin said he was utterly "surprised," "shocked," and "astonished" by the German method of mobile warfare.[14] When prodded by Churchill about when he was going to counterattack the penetration of the panzers, Gamelin responded:

"'Inferiority of numbers, inferiority of equipment, inferiority of method' — and then a hopeless shrug of the shoulders. There was no argument. Here was the admission of the bankruptcy of a whole generation of French military thought and preparations."[15]

Our Army certainly has justification for patting ourselves on the back for recent success, as well as a rich history of successful campaigns. We must not be drawn, however, into the same rigid, fixed mindset as the pre-WWII French high command, who relied on recent success to ignore developments in mobile warfare at the operational level. What do the trends of mobile warfare tell us about the characteristics of successful mobile warfare in the next generation?

Use of Mobile Units in Mass at the Operational Level

One lesson that seems to be continually relearned is that mobile units are most effective when massed at the operational level. That is to say, that mobile units

have decisive impact at the operational level where corps or armies are formed with units that move at the same speed, with the same level of mobility. It seems there is a countertrend of "critics" who appear after each war and pronounce the day of the tank and mobile warfare over. This train of thought normally appears very attractive to budget analysts and exponents of artillery or air power. Yet, time and time again, this has been proven wrong.

Thus, our force planners must stay focused at the operational level when task-organizing mobile forces for a campaign. The vast majority of available armored and mechanized divisions in a theater should be massed into a corps or multiple corps operating together. The smaller the deployed force is, the more important it is to mass mobile units. There are force developers who claim longer ranges for direct fire weapons mean fewer weapons systems are needed in a given space. While this theory holds true when comparing Napoleonic weapons systems and battles to weapons systems and battles in the 20th century — this theory has a limit imposed by terrain. If the average line of sight in Europe is 1500m, the utility of ground or near ground (e.g. helicopters in NOE mode) systems able to fire 4500m is minimal. Even Desert Storm, conducted in terrain which favors longer range weapons, proved that mass is still a necessary component of mobile warfare. Mass enables the attacking force to overcome enemy fires, the friction of movement — such as maintenance breakdown and inefficiency in road marches, and it enables the attacking force to attack along multiple supporting thrust lines.

Also, the drastic downsizing in the size of our active duty armored force severely hampers our ability to project a massed, mobile force of significant "weight" into a combat theater, let alone two theaters, while retaining a strategic reserve. We all recognize that we do not have the size of army necessary to even conduct one Desert Storm type of operation. Mobility, and the ability to shift combat power rapidly in a theater of war, is of critical importance in this environment.

The National Guard tank and mechanized infantry battalions, as well as their brigade and division headquarters, have now assumed a critical role. There is a current move afoot to wipe out these units and relegate the guard to CS and CSS roles. The argument for doing this is

illogical. Using Desert Storm as a blueprint, the Army does not have enough mounted units to deploy a sufficient amount to two "nearly simultaneous" regional conflicts, while maintaining a strategic reserve. Force planners are prostituting themselves to political or career pressure if they say otherwise. National Guard combat arms units are absolutely necessary to execute the stated strategy in the event of regional conflicts. If they are done away with, and the two "nearly simultaneous" conflicts occur, it would surely result in a splitting or piecemeal commitment of our few precious mounted units to the two different theaters. To expect units to fight in the first theater, then deploy "nearly simultaneously" to a second theater for another campaign, is pure fantasy. Consider for a moment how long it took to build up for Desert Storm with an army twice the size of what we have now.

Is Surprise at the Operational Level of War still possible?

One need only consider the number of campaigns which have been launched in the last 30 years which were a surprise to the opposing side — the Israeli preemptive strikes of 1967, the Tet Offensive of 1968, the Yom Kippur assault of the Egyptians in 1973, the Russian incursion into Afghanistan, the Panama invasion, the Iraqi invasion of Kuwait, and the Desert Storm offensive. Indeed, the improvements in communications, transportation, mobility and speed of weapons systems, have enhanced the ability to achieve surprise in a campaign.[16]

Always, Always, Always, use the Indirect Approach

Up until Desert Storm, the American fixation on firepower has repeatedly been a distraction from our development of mobile warfare. Of course, there is certainly nothing wrong with using firepower to inflict damage on the enemy, but firepower by itself — without movement — cannot win a campaign. One trend of mobile warfare is the repeated success shown in campaigns where the opening penetration by mobile units was through an enemy weak point. Manstein did not think his plan for the invasion of France in 1940 was anything particularly brilliant:

"After all, we just did the obvious thing; we attacked the enemy's weakest point."[17]

One area to be on guard about is the tendency to underrate the ability of terrain to carry mounted forces. This turned out to be a critical factor in a number of campaigns including the 1940 campaign in France, the Ardennes in 1944, Korea, and Vietnam. Our terrain analysts at the strategic and operational levels must strive to include experienced armor officers and practical experience with armored vehicles in their studies.

Faster, Deeper Penetrations or Envelopments to Operational Depth

There is no doubt that the mobility and speed of mounted forces during penetrations and envelopments has consistently increased during modern warfare. We need to make changes which enhance our ability to take advantage of this trend.

• Cut the aviation units loose in their own corps and divisions. In articles and studies, it was mentioned that "It" would not be able to achieve breakthrough on its own, and that it was not independent enough. Further, "It has to go ahead, but then must return for fuel and supplies."[18] In the initial operations where this weapon was used, critics complained of high breakdown rates (up to 30%) and that it was incapable of lengthy, sustained movement.[19] It was constantly threatened and suppressed from reaching fruition by other, older arms of the Army. Is this aviation we are talking about? No. Critics made these charges about armored forces prior to WWII.

We in the armor and infantry branches are guilty of close-mindedness regarding aviation. In the same way Sheridan and Guderian did not want to be "tied down" to the speed of the infantry, we should not tie the aviation units to the speed of movement of armor and mechanized units. The air assault and attack helicopter units should be used in mass (in divisions and even corps), to lead breakouts and envelopments into the enemy rear. They would fulfill the same function of light horse cavalry, and the light tank units in WWII. Using aviation in mass in the soft areas of the enemy rear — against command and control centers, logistics sites, and enemy reserves — would set the stage for the massed armored thrusts following on the ground. While the aviation units are not as well armored as armor and mechanized units, their speed of movement is obviously much higher. We should use each arm in a way that takes advantage of its respective strengths.

Of course, the aviators must be willing to "go cross-FLOT" with all their aircraft, operate using minimal planning time, and be responsive, flexible, and aggressive in movement. Their leaders must operate with the forward units from helicopter platforms, using "saddle orders," and take initiative in the same way the leaders of high speed armored penetrations have in the past.

• Smaller, more mobile headquarters and staffs. Our headquarters at all levels are too fat. Reviewing the size of headquarters and the method of command used in successful mobile operations in the past discloses the need for small, very mobile headquarters. Desert Storm was a rude awakening for many battalion and brigade XOs forced to operate out of command posts on the move. General Franks' method of commanding his corps was very similar to Rommel, Guderian, and Patton — forward with his subordinate units, giving saddle orders on the spot. The utility of a huge headquarters apparatus in the rear is significantly less in the mobile environment.

Armored divisions now have about the same number of tanks and tank battalions as their predecessors in WWII. Yet, headquarters are bigger, and there are more combat service support soldiers in the divisions. Further, technology has made leaps and bounds in communications and information management since WWII. One would think all this progress would reduce the number of people necessary to run a headquarters. Could we form more tank battalions by cutting headquarters personnel at all levels by 50 percent? You bet.

Also, we should eliminate any 2¼-ton, 5-ton, or HEMTT truck which is supposed to carry "baggage" for headquarters or any unit for that matter. By this I mean trucks which carry duffel bags, tents, plywood map boards, folding chairs, tables, cots, etc. Fewer trucks in march units means greater throughput of units on routes of march.

• Reduce fuel consumption. Our Achilles' heel in mobile warfare with our current and projected combat vehicles is fuel. The engines which propel tanks, Bradleys, and helicopters achieve unprecedented speed for weapons systems...while consuming unprecedented amounts of fuel. Fuel will no doubt be, and always has been, necessary for movement. But, any reduction in the con-

sumption rate would enhance overall speed of movement and make losses incurred by our fuel truck fleet less devastating. We need a new tank engine that significantly cuts fuel consumption. Reducing consumption also means fewer fuel trucks moving on a route, which would again increase throughput of units on the route.

• Train for operational level penetrations and envelopments. We have a total absence of training for operational level penetrations in the units which must execute them. Neither CTCs nor Warfighter exercises train operational level movements. We need a training mechanism which complements these great tactical training events with training in long range, sustained movement. We have all heard stories about horse cavalry and armor units before WWII conducting road marches hundreds of miles in length. We should do the same periodically. We should have some simulation exercise for staffs at brigade, division, corps, and army level to conduct penetrations and envelopments with mobile units to operational depth.

What should mobile units aim for when they penetrate or envelop an enemy force? There seems to be no clear agreement or trend on "the best" target for mobile units after they have penetrated or enveloped an enemy force. Sheridan and Swartzkopf aimed at the enemy mobile reserve. Guderian and Patton preached avoiding enemy strengths and aiming at isolating enemy units, destroying or displacing the "soft" targets, and disrupting enemy command and control. Our current operational doctrine says that the essence of operational art lies in being able to mass effects against the enemy center of gravity.[20] Since each potential enemy may have a different center of gravity, perhaps there is no "right" target for mobile combat units. Having said that, planners must take advantage of the relative strengths of armor/mechanized units (characterized by heavier armor, moderate mobility, and heavier firepower) and aviation units (characterized by lighter armor, higher mobility, and lighter firepower).

We should also continue to develop anti-tank missile technology. Having ATGM units available which can provide defense against enemy tanks will allow us to mass armored units at the operational level for attacking the enemy. If our light infantry is unable to defend it-

self against tanks, and requires attachment of tanks in a defensive mode, it will reduce our ability to concentrate forces at the operational level. The further our drawdown goes, the more important this phenomenon becomes.

One must also acknowledge that the characteristics of armored forces and aviation are slowly drifting towards each other. The tank and infantry fighting vehicle is getting faster, and the helicopter is carrying heavier armor and weapons than previously. Perhaps 50 or 100 years from now the difference will not exist — there could be one platform able to operate on the ground with heavy armor and firepower, but able to move through the air. That, as they say, is another story.

Notes

[1]Hoyt, *On to the Yalu* (Jove Books, 1991) p. 54.

[2]MacArthur, *Reminiscences* (Crest Books, 1965) p. 397.

[3]Starry, *Armored Combat in Vietnam* (Arno Press, Inc. 1980) p. 199.

[4]Ibid., p. 174.

[5]CPT John Wintels and I authored an article for the September-October 1990 issue of *Infantry Magazine* entitled "Tanks with Infantry" in large part due to this type of mindset.

[6]Schwarzkopf, *It Doesn't Take a Hero* (Bantam Books, 1992), p. 381.

[7]Ibid., p. 383.

[8]Clancy and Franks, *Into the Storm: A Study in Command* (G.P. Putnam's Sons, 1997) p. 218.

[9]Schwarzkopf said the plan he briefed his commanders on was "a fully realized version of the envelopment I'd proposed to Powell three weeks before." Schwarzkopf, *It Doesn't Take a Hero* (Bantam Books, 1992) p. 382. Schwarzkopf, after making snide remarks about General Franks throughout his book, admitted that "...I'd been too harsh in my criticism of VII Corps *slow* progress during the ground battle." (emphasis added) Franks led the largest armored corps *in U.S. Army history* in the fastest penetration *in history*. Tom Clancy and Franks address Schwarzkopf's criticisms in fine style in their book — which is a much better read, too.

[10]Clancy and Franks, p. 445.

[11]Clancy and Franks, p. 414.

[12]Ibid., p. 449.

[13]Horne, *To Lose a Battle: France 1940* (Penguin Books, 1988) p. 105.

[14]Ibid., p. 426, fn.1.

[15]Ibid., p. 447.

[16]Ephraim Kam, as quoted in Summers, *On Strategy II: A Critical Analysis of the Gulf War* (Dell Publishing, 1992) p. 218.

[17]Horne, p. 659, fn. 8.

[18]Horne, *To Lose a Battle: France 1940,* p. 105.

[19]Guderian, *Panzer Leader* (Ballantine Books, 1972) pp. 34-5.

[20]*FM 100-5 Operations* (1993) pp. 6-7.

LTC Kris P. Thompson is the commander of 2-185th Armor, California Army National Guard. He has previously served as cavalry troop commander, squadron S4, and troop XO with the 1/11th ACR, headquarters troop commander for 4/11th ACR (Air Cavalry), staff officer with VII Corps during Desert Storm, brigade S3 for 2d Brigade, 40th Infantry Division (Mech), and battalion XO for 2-185th Armor. He is a graduate of CGSC and the Canadian Land Forces Command and Staff Course. He received a B.S. in accounting from Kansas State University and a J.D. (law) from the University of Kansas.

Steelers (Continued from Page 40)

- VIPER 5 conducted dismounted reconnaissance and reported tracked vehicle activity vic 100600 at 0300; three T-80s (stationary in a hide position) vic 079609 at 0400.

- Last reported grid 062608, relayed through VIPER 2 at 0445.

Without a clearer picture of the enemy, the TF commander believes that tomorrow's attack will be unsuccessful. He wants you to assume the mission of the scout platoon. At 1630, just as your 1SG arrives at your assembly area with the LOGPAC, the TF commander issues a FRAGO directing you to conduct a force-oriented zone reconnaissance to LOA STEELERS to confirm or deny the S2's template. He wants you to reconnoiter all NAIs; to identify the composition, disposition, and array of enemy forces in OBJ YELLOW and the obstacles in the security zone; and to destroy CSOPs and any other reconnaissance assets in zone. He attaches an engineer squad and an extra FIST to your company team to assist you in your mission, and he orders you to position both FIST-Vs in OPs where they will be able to observe preparatory fires on the objective. He reminds you that all friendly elements, including scouts, must be at least 2 kilometers from any pre-planned targets because the brigade commander has given him MLRS support for the attack. You have priority of artillery fires until 0600, and you are primary shooter for AB0001 and AB0002 prior to the attack. After completing your reconnaissance mission and positioning your FIST-Vs in OPs, you will consolidate your remaining forces at CP 7 and fall in as the trail company team of the TF diamond during the attack. You may leave FIST-Vs and dismounted OPs north of PL COWBOYS, but you must have the rest of your company team positioned at CP 7 prepared to attack when the TF comes through.

The time is now 1700, and the sun will set in an hour. Your assembly area is 3km south of the LD, and the LD is 10km south of PL COWBOYS. The attack is planned to begin with preparatory fires at 0600. You must act now! What do you do?

Requirement:

In 15 minutes or less, develop your COA, and issue your FRAGO and any other reports you would submit. Readers who submit their solutions to the scenario should provide the following: fragmentary order to the company team, the rationale behind your decision, and a sketch of your plan of action. E-mail your solution to: HastyD@ftknox-dtdd-emh5.army.mil, or mail your solution to Platoon and Company Team Doctrine Branch, ATTN: ATZK-TDD-P, Fort Knox, KY 40121-5210.

Battle Command Insights

simulation with computer-generated graphics and combat results. If experience gained at the NTC is questionable, then the value, credibility, and relevance of virtual simulation is probably more suspect. All that aside, repetitive, tough, realistic training is the best way to build in commanders the skills of battle command.

Notes

[1]Franks, Frederick M., GEN, "Battle Command," *Military Review*, U.S. Command and General Staff College, May-June1996, p. 14.

[2]Harmon, E.N., MG, *Notes on Combat Experience during the Tunisian and African Campaigns,* undated memorandum, p. 1.

[3]*Operations, FM 100-5,* Headquarters, Department of the Army, Washington D.C., 1993, p. G-1.

[4]Ibid, p. 21.

[5]*Infantry In Battle,* The Infantry Journal Incorporated, Washington D.C., 1939, p. 343.

[6]Clausewitz, Carl von, *On War,* Edited and Translated by Michael Howard and Peter Paret, Princeton University Press, Princeton, New Jersey, 1976, p. 122.

LTC James E. Zanol enlisted in the Army in 1973, serving in the 9th ID, Ft. Lewis, Wash. until 1976. Receiving an in-service ROTC scholarship, he attended the University of Montana in Missoula, graduating in 1978 with a commission as a second lieutenant in Armor. Assignments include tank company command 1-67 AR, 2AD; a ground liaison officer with Det 2, 81st Tactical Fighter Squadron (A-10) at Flughafen Leipheimin; an instructor in the USAFE Air-Ground Operations School at Sembach AFB; HHC commander and battalion S3, 5-68 AR, 8ID (M), Mannheim; plans officer, G3, 4ID (M), and S3, 3rd Brigade, 4ID (M), Ft. Carson; with the Joint Staff, Pentagon, Washington D.C., as a land forces planner, and an executive assistant in the J-8. He recently commanded 1st Squadron, 11th ACR, at Ft. Irwin, Calif. He has attended the Field Artillery Officer Advanced Course, and CGSC and the Advanced Military Studies Program, School of Advanced Military Studies at Ft. Leavenworth, Kan.

Brigade Reconnaissance Troop

Security Missions

Security is an essential part of all offensive and defensive operations. The BRT provides security for the brigade to the front, along an exposed flank, or to the rear of the main body where a potential threat may exist. The digitized BRT with the LRAS3 and HS3 have significantly increased long-range observation and detection capabilities during screening operations. The digitized BRT provides enhanced situational awareness to the brigade commander through its ability to transmit rapid reports through applique. Applique, through its linkage with other ABCS, enhances the scout's ability to hand off targets between the TF scouts, direct and indirect fire platforms, and Army helicopters.

Surveillance is continuous during security operations. Even during security missions that involve fighting the enemy, gathering information remains the BRT scouts' primary task. Scouts do this by establishing OPs, conducting patrols, and performing limited reconnaissance. If aviation elements support the surveillance operation, then air and ground scouts coordinate to synchronize their digitized and complementary capabilities. This is usually done at the troop level or with the brigade S-2.

Counterreconnaissance is an inherent task in all security operations. It is not a mission, but a sum of actions taken at all echelons to counter enemy reconnaissance and surveillance efforts through the depth of the brigade's AO. Counterreconaissance denies the enemy information about friendly units. It is both active and passive and includes combat action to destroy or repel enemy reconnaissance elements.

The BRT conducts security as the most forward friendly unit. The BRT usually deploys with two scout platoons abreast and in-depth, assigned to observe brigade NAIs. As enemy recon elements are identified in sector, they are reported, tracked, and handed off to the TF scout platoons, who then hand them off to a combat force to be destroyed. With the addition of the BRT, the brigade security zone is extended up to 20 kilometers, providing enhanced early warning and reaction time to BCT elements. The brigade security zone is layered with BRT scouts, OH-58Ds, TF scouts, and killers, which all protect the brigade MBA.

As the enemy main body approaches, the BRT reports and utilizes indirect fires and CAS to disrupt or delay the enemy's attack. In some instances, the BRT directs attack helicopters and CAS against second-echelon enemy forces.

Command and control remains the same, and the critical link is between the BRT scouts and the TF scouts. Leaders at all levels facilitate this by dropping to the TF scouts' net to warn them of the enemy vehicle moving into their sector. With proper reporting and target handover, the effectiveness of the brigade's extended security zone is unsurpassed.

The Future

The BRT concept was deemed a success by the Army, and since the AWE another BRT was activated, for the 2nd Brigade, 4th Infantry Division. However, the organization of the BRT and TF scout platoons were slightly modified. All scout platoons now consist of six vehicles each in the BRTs and TF scout platoons, and all platforms are equipped with an updated version of applique known as FCBC2. These changes are based on the recently unveiled conservative heavy division redesign. Whatever the numbers eventually total, the brigade scouts concept makes sense. Through more training and critical thinking by its leaders, sound TTPs and doctrine will evolve, giving the Army another edge on the modern battlefield.

CPT Thomas Feltey graduated in 1993 from Rutgers University as an ROTC Distinguished Military Graduate. He has served as a tank platoon leader and battalion scout platoon leader in 1-66 AR, 2AD/4ID; as a scout platoon leader in the first digital Brigade Reconnaissance Troop during the TF XXI AWE; and finally as the adjutant for 1st Bde, 4ID.

The Great Wheel Versus Track Debate

Directorate of Force Development Opens a Dialogue
On Merits of Competing Systems

The Armor Center's vision for combat and force development has always been to provide soldiers and commanders the best organizations and equipment possible that will enable them to dominate the 21st century battlefield. As the Army breaches the 21st century, it is paramount that new weapon systems be developed and fielded that exhibit mobility, lethality, survivability, transportability, reliability, and supportability characteristics far greater than anything produced in the past. As we shape strategies for future ground combat platforms, many issues arise which require further study to resolve. One such issue that requires an unbiased analysis is whether emerging systems should be wheeled or tracked.

The wheel or track configuration issue will be a key decision for our Army and the Mounted Force in the next century. In an effort to resolve questions surrounding this issue, the Armor Center will host an open dialogue on wheels versus tracks during 1999. The forum for discussion will be the *ARMOR* Magazine and the Fort Knox Home Page. A recently published *ARMOR* Magazine article entitled "The Wheel Versus Track Dilemma" (Mar/Apr 98 edition) has set the stage for discussion. All interested individuals should read this article in order to understand the fundamental laws at work. A copy of the article and other relevant information on wheel versus track issues may be found on the Fort Knox Home Page under the Directorate of Force Development link (*http://147.238.100.101/ center/dfd/wvt.htm*). This web site will be periodically updated with additional information/data relevant to the wheels and tracks topic as it becomes available. If you have comments (pro or con) relative to this issue, now is the time to let your voice be heard. The Armor Center Points of Contact are:

The need to produce combat vehicles quickly during wartime led to the use of both wheeled and tracked reconnaissance vehicles in World War II. At right above, the M8 armored car, seen scouting in France in 1944, was based on 2½-ton truck technology. The tracked vehicle at right was a T8E1 armored reconnaissance vehicle which was essentially a turret-less M5-series tank with a .50 cal on a large ring mount.

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The Armor Center has requested a HQ TRADOC review and update of the various wheel versus track studies conducted in the late '80s and early '90s. This is a necessary step toward incorporating current or emerging wheel and track technologies that may impact the conclusions reached in those earlier studies.

The Armor Center will publish a series of articles in *ARMOR* Magazine over the next year discussing the key issues surrounding wheels versus tracks. Potential points for discussion include mobility, reliability, transportability and supportability aspects of wheeled and tracked combat platforms; rubber tracks; hydro-pneumatic suspension systems; and in-wheel electric drives. If you are aware of new wheel or track technologies that positively impact these or other relevant points, let the Mounted Force know by submitting an article for publication (or contact one of the above mentioned POCs). Articles of this nature should be forwarded to *ARMOR* Magazine for review and possible publication starting with the Jan/Feb 1999 edition.

The Armor Center's goal for hosting this year long discussion is twofold. First, to conduct a fair and open examination of the merits and shortcomings of both wheeled and tracked configurations without having any pre-determined choice as to the outcome. Second, to arm key leaders with the fundamental knowledge necessary to make informed decisions regarding wheel versus track configurations. These decisions will shape the future for Army ground combat platforms in the next century. Time To Mount Up!

Inaccuracies Appeared In T-80UK Article

I must clarify a few items concerning Adam Geibel's article, "The T-80UK Command Tank," back cover of the July-August 1998 issue of *ARMOR* magazine.

First, the tank photographed is not a T-80UK. It is a T-80U or T-80UD (the only difference between the two is a 1,250 hp turbine engine in the T-80U vice a 1,100 hp diesel engine in the UD) equipped with the Drozd Active Protection System (APS). This is evident by the four rockets with visible warheads fitted to each side of the turret, and the standard eight smoke grenade dispensers. The TShU1-7 Shtora-1 Countermeasures system is standard equipment on the T-80UK. It comprises Electro-Optical jammers fitted to the turret on both sides of the main gun and a total of 12 aerosol grenade dischargers.

Second, in paragraph four, the author correctly lists three antennas; one UHF, one HF and one 11 meter telescopic HF/UHF. However, in paragraph five he incorrectly identifies the R-163-50U (UHF) radio as R-163U with a VHF capability and fails to identify the R-163-UP (UHF) radio. The difference between UHF and VHF is significant. The UHF frequency range is between 300MHz - 3 GHz, while VHF ranges from 30MHz - 300MHz. The T-80UK has two UHF radio sets, the R163-50U and R163-UP (10 preset frequencies

The T-80UK, as seen in a Russian sales brochure.

each), and one HF radio set, the R163-50K (16 preset frequencies).

Third, in paragraph seven, the author discusses an EhDKV round with an electronic remote control proximity fuse. After reading this article, I contacted the National Ground Intelligence Center (NGIC) and asked if they knew of this round. They could not identify a round by that name, but did identify a round with similar capabilities called "AYNET."

Adam Geibel does not list any source for his article. However, much of the information in his article is also found in a Russian article by Colonel Sergey Roshchin titled, "The Commander's Armorclad," found in the Russian magazine *ARMEYSKIY SBORNIK,* dated Sep 95. My sources are *Jane's Armor and Artillery, 1997,* the Export Catalog of Russian Armament and Military Equipment, a Russian sales catalog titled "Armored Combat Material," and the National Ground Intelligence Center (NGIC).

<div align="right">

TOM J. MEYER
MAJ, MI
USAARMC Threat Manager

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(MAJ Meyer is entirely correct in his observation that the photo I supplied for the T-80UK is incorrect. I apologize to the staff and readers of ARMOR for any confusion I may have caused. — Adam Geibel)

LETTERS (Continued from Page 4)

The real challenge has always been to incorporate new technical capabilities into a cohesive operational concept and not simply jump onto any new technical gizmo as if it were a panacea that will change the face of land warfare as we know it.

<div align="right">

CHESTER A. KOJRO
LTC, Armor, USAR
Rolla, Mo.

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The Search for a Scout Vehicle

Dear Sir:

In reference to Col. Melton's letter in the March-April issue, I would like to talk about the armor scout. It seems, for years, armor doctrine has not considered him an important asset.

We have had dismounted or mounted scouts in the Army since the American Revolution. He was very important in the Civil and Indian Wars. The scout did his job well in radio and machine gun jeeps in World War II and Korea. After Korea, we tried to give the scout more protection than his armor vest. The M-114 was a disaster as a scout vehicle. We even put a 20mm gun on it, and it was a greater disaster.

The scout vehicle development program (XM-808) was terminated in favor of the M1CV (Bradley) program. Does anyone out there believe the M3 could have ever been a real scout vehicle? It is a fighting machine for armored cavalry, a very powerful one, but it will never be a scout vehicle. Did we ever believe that the super intelligent gathering devices from space would replace the ground scout in real time? I think there are those who did, but they were mistaken. There are rules for ground scouts that go back a very long, long way.

Ground reconnaissance is obtained by continuous operation, by movement in all kinds of weather, night and day. The mission is observation and reporting.

Reconnaissance sections or teams work in pairs. One covers the advance of the other when it reconnoiters while the other stands guard ready to cover a withdrawal by fire if necessary. Scouts must lie in wait and watch, often for a long time.

All scouts should keep their eyes, ears, and weapons trained on the most likely positions of ambush. The enemy knows if he opens fire on a scout team, a communication button is going to be pressed even before a death blow can be made.

Scouts must avoid combat unless it is necessary to escape.

The rule in meeting resistance by fire is 1) take cover, 2) relay information, 3) run like hell!!!

If armor scout elements are expected to fight a decisive engagement, they are not being used correctly. We need very *current* information so commanders can determine what might be a decisive action. The human scout is still indispensable.

The HMMWV is a proven vehicle, but is it a scout's mount? I would like to know what the present scout leaders think about this. I realize the UAVs are going to be a great tool for scouting, but they are not the full solution.

I wonder what happened to the small Cadillac Gage "Commando Scout." It was an armored, 7-ton, high speed, four-wheel drive vehicle that had excellent mobility. As I remember, it had machine guns only. I would have thought that after what we learned in "Desert Storm" about the need for ground reconnaissance scouts, we might have taken another look at the "Commando Scout" as a scout's mount.

Thank you for the space in your fine journal.

<div align="right">

ARTHUR T. BENSON
An old Armor Scout Leader

</div>

REVIEWS

A Unit's Battle History, Warts and All

South Albertas: A Canadian Regiment at War by Donald E. Graves, Robin Brass Studio, Toronto, 1998. 408 pp. Maps, photographs, illustrations, notes, appendices, and index. ISBN 1-896941-06-0. $47.95 (hardcover).

That official regimental histories rarely appear on graduate level reading lists in either the military or civilian worlds is hardly cause for surprise. Writers who strive to cast certain events and people in the best possible light tend to leave too many skeletons in closets and, worse yet, sometimes hide them willfully, leaving only a sanitized collage of anecdotes whose collective "we were the best" theme rarely holds up under closer scrutiny. Readers weary of such transparent spin-doctoring will find *South Albertas: A Canadian Regiment at War* well worth their time, for author Donald Graves largely avoids it. Graves, a heritage consultant whose previous books include two War of 1812 battle studies and *Normandy 1944: The Canadian Summer*, relies heavily on interviews, letters, and unpublished reports (including German sources) to set extant official records straight. He writes not only of a better than average World War II tank outfit and its heroes, but of its demons: paralyzing fear, questionable command decisions, and bitter memories. The result is a rare combination: a first class beer-and-popcorn read that is thoroughly researched, well illustrated, balanced in its conclusions, and — most important for today's armor leaders — full of insights which are still useful.

Originally raised in June 1940 as infantry, the South Alberta Regiment did not see action as the 29th Canadian Armoured Reconnaissance Regiment until July 1944, when it landed in Normandy with other follow-on elements of General Harry Crerar's First Canadian Army. From that point forward, the SAR's luck usually fluctuated between bad and rotten. During 19-22 August, the regiment was isolated from other elements of the Canadian 4th Armoured Division's 10th Infantry Brigade — in Falaise Gap during the breakout attempt by the German Seventh and Fifth Panzer Armies. Subsequent operations in Belgium, Holland, and the Rhineland contributed to an already steep AFV loss rate; in the last instance, 61 tanks out of an authorized strength of 72 were knocked out during a single month. In the historian's search for the guilty, Commonwealth generals fare poorly, especially MG Chris Vokes of the 4th Armoured and LTG Guy Simonds of II Canadian Corps, both of whom habitually

ordered ill-conceived armored assaults over unfavorable terrain and blamed subordinates when those operations failed. Although the cases against Vokes and Simonds are well argued, the reader is left to wonder how much more progress would have been made by experienced armor commanders in the First Canadian Army's AO which, from September 1944 until February 1945, was the polder-strewn North Sea littoral. For all of the South Albertas' major actions, excellent maps and terrain photographs are included.

Graves bases the South Albertas' claim to outstanding regiment status on its own KIA count: a lower total than that of any other tank regiment in the Fourth Armoured despite the involvement of all in intense combat. Several explanations flow from this statistic. First, the SAR was more cohesive when under fire because of its unusually long pre-deployment training period and because an atypically high percentage of its lieutenants came from within its own ranks. As for field grade commanders, the South Albertas had but one commanding officer from Normandy to Germany, except for brief periods, and the squadron commanders had all been with the regiment since 1940. One other benefit was accidental: the troopers' early infantry training yielded unusually effective cooperation with supported infantry later on. There were less favorable — and more typical — circumstances as well. The high casualty rate among troop commanders is one. With inadequate time to brief their tank commanders, Canadian lieutenants, like their American counterparts, were compelled to ride at the head of the column far too often. The Canadian Armoured Corps' choice of tank is also important: its Shermans were just as thinly armored and combustible as their American cousins.

Inclusion of the theater-wide context will prove a significant plus for readers less familiar with operations of the 21st Army Group. The author's explanation of that formation's slow progress near Caen — that Montgomery was consciously facilitating an American breakout by tying up as many German armored formations as possible — is essentially Monty's own taken at face value, but readers in search of a countervailing view can easily consult Stephen Ambrose's *The Supreme Commander* or Eisenhower's *Crusade in Europe*. Graves also contends that troops from the rural west tended to be more self-reliant and mechanically inclined than urban easterners. Although centered on a grain of truth, this generalization is arguably as tenuous when

applied to Canadians as it is when applied to Americans; readers familiar with the history of our own 4th Armored Division — a formation whose ranks contained a significant percentage of New Yorkers — may take exception to it. At any rate, *South Albertas* rests on a foundation of sound research rather than hyperbole. Good history in an attractive package, it is suitable for coffee tables and professional libraries alike.

JOHN DALEY
Pittsburg, Kansas

General John Buford: A Military Biography by Edward Longacre, Combined Books, Conshohocken, Pa., 1995. 312 pages, $24.95 (hard cover).

But for his unfortunate death from typhoid only six months after his well-known stand at Gettysburg, General John Buford might have emerged from the Civil War as the leading Union cavalryman of the conflict. In less than sixteen months as a field commander, he had established so solid a reputation that he was Sherman's choice to lead the cavalry of his western army. Unfortunately, fatal disease intervened.

In the vast realm of Civil War biographies, this is one that needed writing. Buford's Civil War operations demonstrate that he was ahead of his time in a readiness to abandon the heavy cavalry tactics of Europe and adapt light cavalry methods to the American countryside. His experience with the First and Second Dragoons on the western frontier no doubt contributed to his flexibility of mind.

John Buford was ready for the challenges of West Point when he entered the Military Academy in 1844. He had prepared himself academically and was in excellent physical condition, much the result of many hours on horseback. A cadet lieutenant in his senior year, he graduated a respectable sixteenth in the 1848 class of 38 members. His class standing was enough to gain him his preferred service in a mounted unit. Reporting to the First Dragoons in the fall of 1848, Buford served only a year with the regiment before being transferred to the Second Dragoons. During the 1850s, he was often assigned as a staff officer, but had risen to captain commanding a company by the time the Civil War broke out. During his years as a dragoon, he had gained an appreciation for the importance of horse soldiers being able to fight equally well mounted or dismounted.

Unlike many of his contemporaries who left the Regular Army for higher level appointments in volunteer organizations, Buford made no such change and was appointed assistant inspector general with the regular rank of major. In the coming months, he was to scrutinize the formation and training of volunteer units, reporting fairly and accurately, but pulling no punches where criticism was deserved. It was June, 1862, before Buford was able to break loose from staff duty and join General John Pope's army in Virginia. In July, with the relief of a brigade commander, Buford was given the command and advanced to brigadier general.

Until August, Buford was a part of the cavalry actions in Northern Virginia, honing his brigade into an efficient scouting and fighting force. With the reappointment of McClellan to command the Army of the Potomac after the Second Battle of Bull Run, Buford was appointed Chief of Cavalry of that Army. It was a staff job, though, and Pleasanton would command in the field. Needless to say, he found the job frustrating, even more so after Burnside took over command from McClellan.

In March, 1863, Buford was finally back with troops, this time as brigade commander of the Reserve Cavalry Brigade of the Army of the Potomac. His brigade was composed of the First, Second, Fifth, and Sixth United States Cavalry plus the Sixth Pennsylvania. While many of the Regular Army officers of the pre-war days had transferred to the Volunteers at higher ranks, a number of officers, and some former noncommissioned officers, remained in the regiments. Buford's first major action in command of this brigade was participation in Stoneman's raid during the Battle of Chancellorsville. Soon afterward came the great cavalry clash at Brandy Station, where Buford's brigade, as well as others, showed how the Union cavalry had finally become a match for Stuart's horsemen.

It was, of course, at Gettysburg, that Buford gained lasting fame. All his instincts and experience led to his recognition of the critical terrain west of town. The responsiveness of his troopers to his leadership resulted in the brigade holding its position against Confederate infantry until the timely arrival of Union reinforcements.

In the post-Gettysburg months, Buford commanded a cavalry division, participating in the cavalry fights in Northern Virginia. Physically worn out by the campaigning, by fall he could feel himself "winding down like an old clock." In fact, he was deathly ill, and in November was invalided to Washington, where he died on December 16, 1863.

Edward Longacre is already an established expert on Civil War cavalry and this book should add to his reputation. He shows an appreciation for the tactical talents of Buford, talents which led Buford to handle his brigade and division with skill matching that of any Union cavalry leader. Longacre has written a highly readable book that fills a gap

in Union cavalry history and can remind cavalrymen of today of the basis for modern cavalry tactics.

PHILIP L. BOLTÉ
BG, USA, Ret.

M1 Tank Platoon II by Microprose. Requires IBM PC 133mhz Pentium, Windows 95 with DirectX v5.0, 16MB RAM, SVGA Graphics, 200MB HD Space, 4X CD-ROM drive, joystick, mouse and DirectX compatible soundcard. $39.99 (latest on-line price).

Recommended: IBM 200mhz Pentium, 32 MB RAM, 3dfx graphics capability. For multiplayer: null modem cable (2 players), 28.8+ modem (2 players), LAN with IPK protocol (2-5 players).

Reviewed on: IBM 133mhz Pentium with Windows 95 and DirectX v5.0, 48 MB RAM, 4X CD-ROM drive.

The long awaited sequel to *M1 Tank Platoon, M1TPII* claims to be the "definitive simulation of modern ground warfare." When I first loaded and tried to play *M1TPII*, I was sure that it was NOT what it claimed to be. The game contained so many bugs and feature omissions that I actually shelved it. Then I heard that Microprose had released a patch file that fixed many of the problems that made the game unplayable. I won't list all of the problems in the 1.0 version, but **do not** play this game until you have downloaded and installed the v1.1 patch available at www.microprose.com.

After reading 2LT Smith's review of *iM1A2 Abrams* in the March-April issue of *ARMOR* and playing *M1TPII*, I thought that the games must be remarkably similar. Feature for feature, *M1TP2* and *iM1A2* are almost identical. I bought *iM1A2* in the sales rack for $9.99 and compared the two. *M1TPII* is definitely the better of the two.

In *M1TPII*, you command a platoon of M1A2 tanks through a series of training, battle, or campaign scenarios. You can also play in a multi-player mode with four players acting as the tank commanders and platoon leader, and the fifth player controlling OPFOR.

The heart of the game is the interaction between the tank simulation and the tactical battle simulation. The tank simulation is the better of the two by a wide margin. You can control your tank from the TC's positions (open hatch, vision blocks, CITV, GPS-E) or the gunner's position (GPS or GAS), as well as monitor your platoon's status using the IVIS. Graphics and realism are superb; vehicle turrets fly off when killed, secondary ammunition explosions continue after vehicles are killed, vehicle smoke generators and smoke grenades screen your movement (or the enemy's); even the Velcro for attaching

MILES belts to the turret front is visible on your tanks! *M1TPII* is excellent as a tank simulation, and the "switchology" is present at a realistic level, to include automatic input of lead, ammunition selection, and engagement procedures.

The other aspect of *M1TPII*, the tactical control of the remainder of your platoon, as well as attached units, is not as well modeled as the tank simulation aspect. The IVIS in the TC position is not functional beyond situational awareness; you must move to a map screen to tactically control your units. Unfortunately, this screen is very simple and not as "sexy" as the tank simulator. Even worse, to effectively command your platoon, control attached units, monitor the enemy situation, and control indirect fire and close air support assets, you must spend most of your time on the map screen. This has the sad effect of making most of your experience playing *M1TPII* reminiscent of playing *Kampfgruppe* on a old Commodore 64 computer! The functionality of the mapscreen should have been included in the IVIS portion of the TC's position, which would have allowed you to monitor the tactical situation and command your units while still feeling like you are inside the tank.

Despite the problems, *M1TPII* is thoroughly enjoyable and engrossing. You progress through the training, single battle, and campaign modes in crawl-walk-run fashion, building from stationary single tank versus stationary targets engagements to commanding a full armored cavalry troop at 73 Easting, culminating in commanding assorted units through a fully interactive campaign.

In the training mode, you are presented with a series of scenarios at Fort Knox that train you in individual tank gunnery techniques, followed by a "rotation" at the National Training Center where you are trained in platoon command and control, close air support, and indirect fire support culminating in a combined arms exercise.

In the single battle mode, you can fight battles ranging from 73 Easting to Fulda Gap, or fight in a battle randomly generated by the computer. The campaign game is the highlight of your training experience. You can fight in the Gulf War II, North Africa, Russian Far East, the Balkans, or Central European campaigns. In a campaign game, you generate your own platoon, which you can track by individual crew position. Platoon management through awards, promotions, and duty position assignment is an important aspect of the campaign game.

The multiplayer mode offers the most potential for the use of *M1TPII* as a training aid. In this mode, four players can act as the TCs within the platoon, while the fifth (the company commander?) runs the OPFOR. While it is possible to play over the internet, it is not recommended; a dedicated LAN works best. The only serious limitation to *M1TPII's* use as a training aid is the lack of a scenario

editor that would allow the trainer to define the parameters of a scenario. Perhaps someone out there in a TOE command could experiment with this capability and report on it. The flexibility and independence of being able to conduct platoon level gunnery and tactics with five networked multimedia computers and five $40 simulations is worth checking out.

Overall, *M1TPII* is a highly realistic and playable simulation that has the potential to provide an off-the-shelf training product that could be included in an innovative training program. If Microprose is as responsive to the problems identified by players in the 1.0 version, future patches could improve the utility of *M1TPII* as a training aid. Personally, I am more than happy just playing it. Back to my tank platoon fighting Gulf War II...

CPT JERRY A. HALL
Colorado Springs, Colo.

i Panzer'44 by Interactive Magic, $39.95. Requires Windows 95, Pentium 133+, 16 MB RAM, 50 MB Hard Drive Space, and 4X CD-ROM.

Recommended Pentium 200+, 32 MB RAM, 8X CD-ROM+, 3D Accelerator.

CITVs, laser rangefinders, stabilized fire controls... WHO NEEDS 'EM!!! *Ipanzer'44* takes you back to a time when tanks were made of pure steel, as were the men inside them. Following up on their successful *iM1A2* (see March-April 1998 review), Interactive Magic leaves behind all the armored warfare technology of today for the brutal simplicity of yesteryear.

Ipanzer'44 takes place in 1944 during World War II's most critical days. Russia launches Operation Bagration and the Germans attempt a desperate counterattack against the allies in the Ardennes. *Ipanzer'44* covers both of these historic operations and gives the player the chance to operate one of the premier tanks of World War II.

Interactive Magic focuses on the primary medium tank used by each side during World War II. You come face-to-face with the Russian T-34, the powerful German PzKpfw V, more commonly known as the Panther, and the dependable American medium tank, the M4A3 Sherman. For history or armored warfare lovers, this is paradise.

You have the choice of commanding a tank platoon (and other support units) from any of these countries in either a Eastern or Western Front scenario. The Americans and Germans can slug it out in the snow-covered Ardennes Forest. The Soviets and Germans struggle for control across the green rolling plains of Belorussia. Both scenarios offer single battles or long-term campaigns.

Installation of the simulator is simple. The program practically installs itself with little input from the operator. The start-up sequence has some motion picture clips that add to the overall feel of the time era. Once in the tank, controls are easy to use and master. The accuracy of the turrets is impressive. You actually see the turret machine guns inside the turret ring. The driver's compartment is even more realistic, as I started to feel claustrophobic in the T-34's driver compartment! These tanks were made with fighting in mind, not the comfort of the crew. Jumping from position to position is simple, and the tanks respond to your commands. You can actually feel the muscle versus machine struggle to control these war beasts as you maneuver across the open terrain. Reports from the field blare across the radio when any of your vehicles are under fire. Your loader responds to your ammunition commands and reports (in the appropriate accent of your selected nationality) when a round is loaded.

Interactive Magic uses a similar format to their *iM1A2* series. *Ipanzer'44* uses a user-friendly map to control the overall battlefield. In addition to your tank platoon, you can select from a full complement of supporting units, ranging from tank destroyers to artillery units to AT guns. You control your entire combined arms team (if you wish) maneuvering against an impressive computer enemy.

The computer AI is just as tricky and impressive as *iM1A2*. I watched as a Soviet SU-85 assault gun platoon set up a firing line and proceeded to pound my Panther platoon. While trying (and not succeeding) to penetrate their frontal slopes, a platoon of fast-moving T-34's maneuvered around my flank and ruined my whole day. Artillery plays a big part in the game as well. I was amazed when I first sent out a forward observer in an American jeep to scout for oncoming German tanks. When the two-man crew (yes, you can actually see a soldier standing at the .50 cal machine gun) spotted the German recon forces, a voice rang out from the computer "Commencing Artillery Fire!" To my surprise, the FOs called for and adjusted 155mm artillery fire! But beware, the other side has this same capability and a FO in a stand of trees makes for a long and costly operation.

Damage is both realistic and accurate. I watched in horror as a charging Panther set afire four out of my five Sherman tanks (Americans had five tanks per platoon) as I uselessly hit the Panther's front slope with what might as well have been spitballs. The T-34 is a tough opponent with its speed and firepower. You'll find the Shermans require more skill to use in order to hit the flanks and rear of the better armored German tanks. You have historical ammunition to choose from as well. The German HVAP (High-Velocity, Armor Piercing) works great on just about all vehicles. AP, APHE, HE and smoke

rounds are available, along with the coax machine gun and the bow machine gun.

The terrain graphics have improved in *Ipanzer'44* compared to *iM1A2*. Stands of thick forests are impenetrable to tanks but infantry and anti-tank squads can maneuver through undetected. Scattered trees and realistic elevation effects gives the game a nice feel. The interior of the tanks were designed from actual photos. External accuracy is complete down to the proper number of roadwheels. At times the tanks appear boxy, but I was able to identify a T-34 from an SU-85 at 1,000 meters without a problem.

I played *Ipanzer'44* on a 200mhz Pentium without a 3-D accelerator. I found the controls to be somewhat jerky and slow to respond. I'm not sure how the game plays on something hotter than a simple Pentium (i.e. MMX or Pentium II) but I would suspect smoother operations, much like *iM1A2* plays. As mentioned earlier, the graphics seem to lapse during certain times of the games. Although you have both a coax and bow machine gun, I missed having a commander's machine gun on top of the turret. Picky, but there are lots of running infantry on the ground to deal with!

iPanzer'44 includes a multi-player capability that allows budding tankers to fight head-to-head or cooperate over a network or the Internet. Fighting another person always increases the unpredictability and enjoyment of the game. However, *iPanzer'44* has plenty of difficulty levels and a computer AI that will keep you on your toes.

If you want to experience the simplicity and power of World War II armored combat, *iPanzer'44* is the game for you. For any tanker, history buff or simulator guru, this is a game in which history not only leaps to life before your very eyes; it executes an action right battle drill and tries to run you over!

MIKE SULLIVAN
Captain, Infantry
Ft. Knox, Ky.

Rommel's Greatest Victory, The Desert Fox and the Fall of Tobruk, Spring 1942 by Samuel W. Mitcham, Jr., Presidio Press, Novato, Calif., 1998. pp. 243 w/index. $27.95 (in hardback only).

Although the popularity of the "traditional" battle-narrative has faded somewhat in the past decade, this book illustrates that the genre is still viable, when well written. Mitcham, a professor of history at Hendersonville State University in Louisiana, has obviously done his homework. The book is a solidly researched, clearly written, and straightforward account of the battle of Tobruk. This battle, fought in the Libyan desert

for the important fortified port city needed by both the British and the Germans, represents the high-point of Erwin Rommel's combat command.

Although the book offers little in the way of overview or deep analysis, it may serve soldiers well as an example of how "leadership from the front" was executed by one of the masters of maneuver of the Second World War. Mitcham does a credible job, although relying mainly upon secondary sources, in bringing the backgrounds and influences of the various leaders to light. However, in some ways his infatuation with Rommel pokes through a little too clearly. The background on Rommel himself sheds no new light on the man and has a somewhat "legendary" quality to it.

This is a book about commanders, "Great Men," and that is as far as it goes. If you are looking for a book about what life for the common soldier serving in the Afrika Corps or the British Army was like, look elsewhere. Mitcham rarely dips below the level of lieutenant colonel in his narrative. If there is a general fault with the work. I would say that it is this. Since the appearance of John Keegan's classic work, *The Face of Battle,* it has now become common to include at least a chapter in most battle narratives about what life was like for the men on the ground, the fighters, and not just the decision-makers. Such an addition might have doubled the value of this book. His description of the environment of combat in North Africa was somewhat shallow.

For all that, I found the book a worthwhile addition to my general biography section. There are plenty of clearly illustrated maps that accompany the text well and help define the operational flow of the battle, and that alone nearly justifies the cost of the book. Some human-interest stories are interspersed throughout the text also. (Who would have guessed that the Afrika Corps had a regimental commander that occasionally rode into battle wearing a Scottish kilt and wielding a broadsword? Who says that only the British tolerate eccentrics in their command structure?)

Finally, there are the periodic examples of field innovation that serve as one of the primary utilities of history for professional soldiers. For example, one British regimental commander, forced to withdraw under fire with Grant tanks (whose 75mm main gun was hull mounted) improvised a reverse bounding overwatch covered by the tanks' own smoke shells that managed to save the majority of his command from destruction. (Lesson #1: Don't buy tanks with hull mounted main-guns. Lesson #2: A wide range of munitions is a nice thing to have in a pinch.)

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ROBERT L. BATEMAN
CPT, Infantry
Westpoint, N.Y.
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Stalingrad, The Fateful Siege: 1942-1943 by Antony Beevor, Viking Penguin Books, 1998, 512 pp. $35.

The Tiger Tank by Roger Ford, MBI Publishing, 1998, 96 pp. $17.95.

Pzkpfw VI "Tiger" I (Sd.kfz.181), The Original Tiger Tank Manual, translated by Wulf-D. Brand, Self-published by the author (Teutonia Publications, P.O. Box 3061, Newport News Va., 23603), 1997, $48 including shipping world-wide.

Thunderbolt: General Creighton Abrams and the Army of His Times by Lewis Sorley, Brassey's Inc., 1998, 448 pp., $21.95 (Paperback edition).

Sherman – A History of the American Medium Tank by R.P. Hunnicutt, Presidio Press, 1978, 575 pp. $100.

Because of the scope of our magazine, some books recently received deserve mention, but not a full-scale review. Among them is Antony Beevor's *Stalingrad: The Fateful Siege: 1942-43*, which topped the non-fiction best-seller list in London for months after its original publication in March. It is not hard to see why. Beevor not only capitalizes on much new information available in Russia about this turning-point battle in WWII, but casts the campaign's immense complexity in some of the best writing that's appeared in this genre.

Describing the onset of Operation Uranus, the great Soviet counterattack that began the encirclement of the German Sixth Army, he writes, "…The Soviet cavalrymen, with submachine guns slung across their backs, cantered on their shaggy little Cossack ponies over the snow-covered landscape almost as fast as the tanks. The T-34s, with their turrets hunched forward on their hulls, looked equally impatient to be at the enemy…" How freshly written that is, but anyone who has seen old news films of T-34s on the Eastern Front would have to agree. Yes, they *do* look sort of impatient and their turrets *do* look hunched forward.

Aside from the wonderful writing, the book is interesting to armor/cavalry readers for its presentation of the Soviet deep-attack doctrine that ultimately put a quarter of a million Germans in the sack, and for its descriptions of armor use, and limitations, when the earlier German campaign bogged down in a bitter city fight.

Finally, the book is another reminder of the almost unimaginable *scale* of World War II. In an era where the loss of a few hundred men (Lebanon) or even a platoon (Mogadishu) is considered reason enough to cut a commitment short, it is mind-boggling to consider that World War II went on for two years after this epic struggle. To lose 100,000 men today would bring down a government.

Roger Ford's book on the Tiger tank is another effort by a fine writer who first came to my attention with his earlier book, *The Grim Reaper,* an excellent, well-written history of the machine gun. This large-format book on Germany's Tiger tank sets off Ford's writing with 70 fine black and white photographs, 10 color illustrations, and a clean, attractive layout and typography. Unlike many book captions that do little more than restate the text, the captions in this book actually add interesting detail. Some chapters discuss the Tiger's development history, others its service record and technical details. Every aspect of this famous heavy tank is covered, making it an indispensable addition to the libraries of armor modelers, but at a modest $17, this book should also find many readers among historians, combat developers, and armor soldiers who want to understand the Tiger's breakthrough design.

The Tiger was a pretty sophisticated vehicle for its time, and introducing soldiers to it presented a training challenge. The Germans met this requirement with the *Tigerfibel,* a manual issued to Tiger crewmen. To make the manual accessible, the technical information was presented in the form of cartoons, short rhymes and maxims, with plenty of drawings of half-naked frauleins to keep the enlisted interest up. (Think pre-P.C Connie Rodd, familiar to '60s-era veterans…) Along with the cartoons, there were finely drawn line illustrations of the various parts to be maintained. Brand, the translator, faced a formidable challenge, especially in translating the rhymed material from German into English while maintaining the rhyme. A weird and unusual book.

Lewis Sorley's biography of General Creighton Abrams, originally published by Simon & Schuster, was very positively reviewed by General Donn A. Starry in the September-October 1992 *ARMOR.* It would be hard to improve on the review by Starry, who served with Abrams and included many interesting personal vignettes in the review. This issue of the magazine also included an extended excerpt from Sorley's book, which is recently out in a paperback edition from Brassey's.

Also newly available again is *Sherman, a History of the American Medium Tank*, by R. P. Hunnicutt, an engineer, former infantryman, and holder of the Gold Medallion of the Order of Saint George, who has made a life's work of documenting the history of American armor in a series of high quality, large format books. Authoritative, extensively illustrated, and beautifully produced, these books are everyday references for anyone working in this field. The 1978 volume on the Sherman covers all of the variants, U.S. and foreign, and weighs in at almost 6 pounds. Expensive, but worth it.

<div align="right">
JON CLEMENS
Managing Editor
</div>

Now Available: An Improved Dogbone Assembly To Defeat Magnetically Fuzed Mines
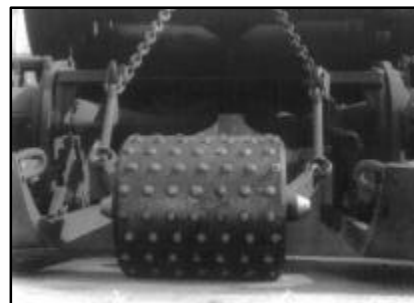
The trend in mines is toward more sophisticated fuzing. Mines that are initiated by the magnetic disturbance of a passing vehicle are becoming more prevalent and are usually more lethal, with a full vehicle-width attack capability. Most of these mines have a self-forming fragment warhead that will defeat all known belly armor.

There is a new mine countermeasure that is capable of defeating these mines, and it may not be in your motor pool. It is the Anti-Magnetic Mine Actuating Device (AMMAD), better known as the Improved Dogbone Assembly (IDA). The IDA is designed to detonate magnetically fuzed mines ahead of the host vehicle. Developed and produced by Israeli Aircraft Industries (IAI), the IDA can be installed in place of the existing dogbone, which is designed to pre-detonate tilt rod-actuated mines. Fitting on both the Mine Clearing Blade (MCB) and Mine Clearing Roller (MCR), the IDA is an Additional Authorized List (AAL) item that becomes a specific component of the MCB or MCR once installed.

The IDA should be used in actual mine clearing operations; the existing dogbone and chain should be utilized in training due to associated costs.

BACKGROUND. The IDA, when installed, rolls on the ground and projects a magnetic field forward of the vehicle and the MCB or MCR. This magnetic field duplicates the magnetic signature of the vehicle, thus it detonates both magnetically fuzed mines as well as any tilt rod-actuated mines encountered. In 1990, the U.S. Marine Corps and the Army purchased approximately 1,000 of these systems for use in Desert Storm. The Project Manager for Mines, Countermine and Demolitions tested the IDA and proved that the device consistently detonates magnetically fuzed mines well forward of the combat vehicle, thereby drastically reducing the chances of the vehicle being damaged by the mine detonation. BOIP, at present, consists of three MCBs per tank company, twelve MCBs per battalion, nine MCBs per ACR squadron, four MCRs per battalion and twelve MCR mounting kits per battalion.

INSTALLATION. Installation of the IDA to the MCR is quick and easy, requiring 30 minutes or less. No special tools are needed. While the installation on the MCB requires a little more effort to install, it still should be no more that 60 minutes, and here again, no special tools required.

INFORMATION TO ORDER. The IDA is an Additional Authorized Item (AAL). The NSN for the MCB IDA is 3815-01-369-7497 and costs $6,261. For the MCR, use NSN 2590-01-380-4852, cost $7,002. Both can be requisitioned the

same as a repair part. Delivery time is approximately 2-3 weeks in CONUS and 4-5 weeks OCONUS.

FUTURE IMPROVEMENTS. The Program Manager for Mines, Countermine and Demolitions is monitoring IAI's new On Board (OB) AMMAD as well as other similar devices. The new OB AMMAD weighs less than 300 pounds, uses approximately 20 Amps at 24 volts, is protected against small arms fire and artillery and mine fragments, and does not impede vehicle mobility. This device is an add-on kit that can be integrated onto a variety of wheeled and tracked armored vehicles. It consists of two magnetic field emitters mounted on the front of the vehicle, a control panel in the crew compartment, and electrical harnesses connecting the power supply to the emitters and control box. This system has the potential to be configured for not only forward projection of the magnetic signature, but for side projection as well. The magnetic signature projected can be changed, if necessary, to defeat potential future changes in magnetically fuzed mines. This new device has undergone limited technical testing by the U.S. Marine Corps with positive results. Estimated cost is $10,000 in production.

CONTACTS.

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