

ARMOR



How Soviets Fought in U.S. Shermans *(See Page 21)*



This issue of *ARMOR* almost certainly complies with a publishing rule we unabashedly borrowed years ago from an old-time New York tabloid writer. His contention was that readers would always come back for more if each day's paper contained at least three surprises — items or stories that made the reader scratch his head and say, "Hmmm...that's interesting. I didn't expect that..." In this issue, I think we've met that criterion.

First off, we know that the feature article, this month a history piece, *Commanding the Red Army's Sherman Tanks*, will surprise all of you in one way or another. Lots of people don't know, or have completely forgotten, that the Soviet Union used tens of thousands of Lend-Lease vehicles during WWII. Studebaker trucks earned a solid reputation with Soviet transport troops. But fewer recall that the Soviets used thousands of armored vehicles, 5,000 medium tanks alone. Huge formations, divisions and corps, were equipped with U.S. equipment. Due to the Cold War and the overwhelming control of information in Stalin's regime, this story was never told. Sure, a few pictures exist here and there, but a first person account, in English, has never appeared. But in recent years, a Hero of the Soviet Union, a retired colonel in the Soviet tank corps, wrote of his experiences, and we believe you will find the excerpt from this book, soon to be published by the University of Nebraska Press, fascinating. We are excited to be able to give you a look into this little known part of the war.

The second article I'm throwing onto the table as a likely surprise is about wheeled armored vehicles, and we aren't talking about Hummers, even the up-armored models, equipping the scouts or military police. The call for wheeled armor isn't a new one, but the author's perspective, that of a peacekeeper in Macedonia, has given him some interesting ideas. Whether you agree with him or not on the utility of wheeled armor, and in his choice of vehicle to fill the shortcom-

ings he observed, we believe you'll want to read this piece through. If you do believe that military operations other than war are going to remain in (or enter into) your unit's mission essential task list, you'll want to thoughtfully consider the ramifications of this article.

Third, and deeper into the magazine, you'll find two articles on command posts that should cause some discussions. I think it is a truism that each unit commander puts his own spin into any TOC/CP organization and configuration. Therefore, no article or series of articles will ever provide the solution to the riddle of what TOC configuration is the best for any unit in any situation. However, these articles will help advance the state of the art of TOC building by giving you some good ideas that were successful for others in similar situations.

One final surprise — I know it is four surprises not three, but we really want to impress you — shouldn't be a surprise, but it may be in too many cases. At the very least, you'll want to slap your forehead and say, "I knew that." Colonel (Ret.) Clarke, the Training Manager at the Royal Saudi Land Forces Armor Institute, has some interesting ideas on what he sees changing and what he sees remaining the same as the digital wave sweeps over us. He believes the tenets of good soldiering and good leading, which have survived other technological revolutions, will again survive this revolution. This article is worthy of your time and your discussion with a friend or two in the range tower, at the TOC, or in the club.

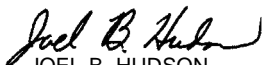
If we have managed to surprise you at least three times, that is good. Know that it is our goal, and with your continued writing and submissions, we will be able to continue meeting that standard.

— TAB

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LETTERS

Digitization Won't Compromise a Commander's Freedom of Action

Dear Sir:

As the Army moves to make a technological leap in doctrine with the advent of digitization, it is nice to see discourse about the possible ill effects of the move to Force XXI. Captain Bateman's article "Force XXI and the Death of *Auftragstaktik*," from the January-February 1996 issue, brings forth some valid issues, but I believe that he draws the wrong conclusion. Digitization of the battlefield does not mean the death of *auftragstaktik* or the loss of independence of action by company commanders. Both will be retained in the digital force, but higher level commanders will be better able to conduct planning, manage resources, and issue FRAGOs to subordinate commanders.

Captain Bateman quotes Ronald Bashista's definition of *auftragstaktik*, identifying its four components. Bateman places great emphasis on what he believes is the paramount component, independence of action. He further proposes that digitization will restrict the company commander's independence of action by providing battalion and brigade commanders with a greater amount of raw data than the company commander has access to. He is quite correct in his conviction that company commanders "bouncing across the terrain" will have little opportunity to consult their digital displays, but the conclusion that he draws from this is incorrect. Digitization will not result in the devaluation of the company commander's authority that he fears.

Higher level commanders already have access to a greater amount of combat information and intelligence than their company commanders. The company commander's view of the battlefield is limited to what he and his subordinates can see and what information he can glean by eavesdropping on the battalion command frequency. Brigade and battalion commanders have dedicated reconnaissance soldiers (battalion scouts, ADA scouts, COLTs, CI/IPW teams); highly specialized information gathering equipment (GSR, signal intercept, Firefinder); access to division and higher collected information (LRSD, divisional scouts, Guardrail, J-STARS); and a full-time staff section to process this information into intelligence. Even without digitization, higher level commanders (and their O3 battle captains) have a better view of the whole battlefield than the company commander.

This better view allows higher level commanders to make decisions and give orders that may seem irrational to anyone divorced from seeing the whole battlefield, but are calculated to accomplish the mission. In terms of *auftragstaktik*, the com-

pany commander must have the obedience to follow his commander's orders — not blind obedience created by fear, but obedience built through trust and respect for the commander's competence. Company commanders must trust that their commander is focused on the success of the mission and execute his orders, however illogical they may seem. The commander who questions his orders without just cause is a force distracter. Independence of action comes not from a company commander operating independently from his battalion, fighting his company based on his own limited view of the battlefield, but rather from the freedom to execute the commander's orders in the manner that best fits the factors of METT-T. True, any battalion commander can usurp the company commander's authority by giving orders directly to platoon leaders, but in doing so, he loses the ability to effectively control his battalion. Digitization will not increase the tendency of higher level commanders to bypass company commanders, but merely increase the amount of information available to paint the picture of the whole battlefield. Captain Bateman suggests that commanders will "become tied to the information node" and command from their BCVs. Currently, the tactical operations center has the ability to replicate the functions of the proposed BCV, albeit non-digitally. Despite the access to information, radio nets, and battlefield operating systems representatives, commanders chose to position themselves forward at the critical point. Executive officers occupy the tactical operations center, assisting the commander by synchronizing the battlefield operating systems. Future commanders will not necessarily want access to the raw information as it flows from the digital network. Rather, they will want their staffs to transform the information into short and concise intelligence bytes that can be readily used to make decisions. By allowing the executive officer and staff to conduct their functions, the commander is not tied to the information nodes, but can move forward to the critical point.

Digitization is not the threat to the company commander's authority that Captain Bateman believes it is. Digitization will increase the amount of information and the speed of its flow. This in turn will sharpen the resolution of the commander's view of the battlefield and reduce some of the fog of war confusion. It could revolutionize the way we fight and increase, rather than decrease, the importance of the company on the battlefield.

Company commanders will continue to be useful in the age of digitization. They will still be required to execute orders and their commander's intent without the commander holding their hands each step of the way. They will still have the independence of action to execute their orders as they see fit. They will not (and do not)

have the freedom to roam the battlefield, fighting as independent companies.

When company commanders receive their orders, they will still need the four components of *auftragstaktik* to effectively execute those orders. They will need the tactical competence to effectively fire and maneuver on the enemy, the self-esteem to know that they can accomplish their orders without having to be guided, the independence of action to apply tactics and doctrine to the situation at hand, and the obedience to follow their commander's orders.

CPT GARRETT L. IDE
B/2-63 Armor
Vilseck, Germany

Bradley FIST Mounting Will Harm G/VLLD's Lasers

Dear Sir:

I read with great interest CPT Crowson's and SSG Peterson's well-written article on converting an M3 Bradley for use as a FIST track ("Now Make a FIST...," Mar-Apr 96). They are both to be saluted for applying innovation to solve a long recognized problem in the field. We all know what a "dog" the M981 is.

Unfortunately, hard mounting the G/VLLD on top of the turret as shown will ultimately bring serious harm to the device. In the M981 turret, the G/VLLD is mounted on a floating plate to dampen vibration during movement. This plate "locks down" only in a firing configuration. Without such an arrangement, the G/VLLD's laser rods will be destroyed, sending the unit back to the depot at a cost of about \$100,000. If the money isn't a concern, the lack of combat readiness should be.

It's a sad commentary on TRADOC and AMC that good folks in the field have to go to such lengths to have a useable system. A wide array of upgrades have been proposed for the M981 to solve its problems until the BFIST arrives. All have been rejected for fear that providing an interim fix to the system will threaten the BFIST program. These upgrades, many of which are fully developed and immediately available to the field, include everything from upgraded power trains (from the M113A3 package), to improved north-seeking gyros, and a new turret to cut set-up time and eliminate much of the FIST's easily recognized signature. In most cases, these upgrades would have paid for themselves with their O&M savings before the much needed BFIST is fielded.

In an age where the requirements process is so carefully supported with sophisticated computer models and gigabytes of

analytical data, it's a shame that common sense is overcome by politics, leaving our soldiers to fend for themselves with welding rods and drill bits.

STEVE SHELTON
MAJ, OD
USAR

Resources Aren't There For Field Trains Command Post

Dear Sir:

Once again, I am generally pleased with the current issue of *ARMOR* (Mar-Apr 96). You truly set the standard in both looking forward and reviewing the past in each and every issue, however, the articles regarding present operations and organizations might stand some improvement. Specifically, I refer to CPT Kevin Banks' article, "The Field Trains Command Post — Organizing for Success." CPT Banks makes several great suggestions for the new HHC commander of the cavalry, armor, or mechanized infantry battalion. His design for the organization and execution of a field trains command post could well result in changes to all of our Tables of Organization and Equipment (TO&E). There is, however, one real problem with much of what CPT Banks suggests... reality.

Reality is that armor and mechanized infantry MTO&Es have no allocation for the Field Trains Command Post (FTCP) beyond the commander's HMMWV and one GP Medium.

Reality is that armor and mechanized infantry MTO&Es do not allocate an "OPS NCO" or a "training NCO" or an "XO's driver." None of those positions are authorized. We all have them, true, but it's a bloody fight to get quality men in these positions, and the bottom line remains that when we start taking casualties, these "non-essential" positions are likely to be stripped, de facto as well as de jure.

Reality is that there is no "expando van" in an infantry or armor battalion to begin with. Nor are there "extra" M577s. I cannot speak for division or regimental cavalry squadrons, so perhaps CPT Banks' experiences are applicable there.

I have commanded an HHC for 24 months; I have deployed a mech TF field trains numerous times in those years, both here at Fort Hood and to the National Training Center. I cede the point that CPT Banks suggests what SHOULD BE. I hope that someday what should be, WILL BE. (I doubt it, but I still hope!) But for today, *ARMOR* needs to concern itself with accuracy in its articles. What is published in *ARMOR* is seen in the field as reality, and accepted as factual. The fact is that the Field Trains Command Post (and HHC company head-

quarters) is not acknowledged as a valid resource requirement in our armor and infantry MTO&Es. Until it is, the FTCP will remain deficient in personnel and equipment, and the force will suffer.

ROBERT L. BATEMAN
CPT, IN
Cdr, HHC/2-7 Cav, 1st CD
Ft. Hood, Texas

Editor's note: Throughout ARMOR's 108-year history, it has been a magazine where the professional warfighter could discuss what should be versus what is and be guaranteed an audience. In that sense, it is not an official publication, as the views represent those of the authors (see page 2). We will continue that winning tradition.

External Gun Turrets: Refuting the Critics

Dear Sir:

There were two letters in the March-April issue that were very critical of my article, "The External Gun Turret: Often a Bridesmaid, Never a Bride" (*ARMOR*, Jan-Feb 96), one by J. Boucher, U.S. Army (Ret.) and the other by MAJ R. Duvall, USMC. These tirades did not offer any reasoned response to the issues that I brought up, but relied instead on personal insult and accused me of saying things I never said. In my article, I made several points: (1) That the EGT's loss of good direct vision from the turret top is a decrease in survivability; (2) That the elevated gun position decreases survivability because of high silhouette and exposed mechanisms; (3) That the EGT is excessively complex due to remote operation of subsystems; and (4) That there is an unacceptable loss of interior volume and surface area for mounting components. In the article, I explained why these four points were valid.

Prior to submitting the article, I asked three friends to read and comment on the article. They did so, and all their comments have been incorporated. All are experienced in design, testing, and production of combat vehicles. Two are experienced turret design engineers (real turrets, as well as paper turrets) and one is a program manager on development of an armored fighting vehicle. Two of the three are armored combat veterans of Vietnam, and all three must average about 30-35 years experience each. They are still active in the defense business. I omitted their identities because I anticipated a hostile reaction due to the fragile pride of the government developers.

The critical letters did not offer any reasoned counter-argument against my points except to say that:

(1) I am naive. (Boucher) Not true. I am very cynical, especially of federal programs that spend a lot of money on not much more than paper.

(2) I use the kind of logic that opposed the machine gun and the airplane. (Boucher) Not true. That kind of logic was an entirely internal military problem which resulted in our going into WWI so poorly equipped that our allies had to furnish us with not only machine guns and airplanes, but also artillery and tanks. Not all this problem was due to penurious pre-war funding levels. Most of it was due to a dithering bureaucracy that couldn't make up its mind. "Machine gun development in this country floundered on one thing only: Those in authority could not make up their minds on what was wanted. ..." (Chinn, George M., LTC, USMC. *THE MACHINE GUN, History...Weapons*, p. 173, Vol. 1 of III. BuOrd, 1951.)

(3) I never said or implied that the external gun turret (EGT) was extensively tested. (Boucher and Duvall.) A bad idea doesn't need a lot of testing to reveal its limits. Even a design study, if honest, objective, and performed by competent engineers, can reveal most of the advantages and disadvantages of a particular approach. A final decision as to whether or not to enter production, of course, must follow extensive testing.

(4) Mr. Boucher questions my motives. My motive is to show the readers of *ARMOR* a different viewpoint of EGT than the one offered by proponents of the program. If Mr. Boucher has something concrete about my motives being other than advertised, say so.

(5) MAJ Duvall's first two paragraphs state his unfavorable opinion of my work, which comments I summarize as, to use his word, "drivel." His second paragraph is not related to anything I said. In regard to the ignorance of EGT that he ascribes to me, he should know that ideas such as EGT existed long before ASM and have been examined for other applications in parallel with ASM. Unfortunately, there are those in government who have fallen in love with EGT and it will, like Dracula, rise again from the grave to suck the taxpayers' blood.

(6) MAJ Duvall, in his third paragraph, speaks highly of the experts for whom he worked on the ASM program. I am sure they are experts, but the facts are that many major federal programs get into trouble, even though led by highly qualified people. For those who wish to learn more about ASM, try: *ARMORED SYSTEMS MODERNIZATION, Program Inconsistent With Current Threat and Budgetary Constraints*; U.S. GAO, Report No. B-244187, July 1991. AD-A242 142.

Continued on Page 49

Your Mind Is Your Primary Weapon



MG Lon E. Maggart
Commanding General
U.S. Army Armor Center

For more than forty years, military analysts have predicted the coming of “push-button war” where experts wearing white laboratory coats monitor super-sophisticated machines capable of conducting target acquisition and attack without the need for human intervention.

With the 1991 Persian Gulf War, there were glimmerings that this era had arrived. Carefully-chosen footage of “smart” munitions selectively destroying bridges or flying through specific windows of a building showed a world where guesswork was removed, human error eliminated, and perfect execution mastered. Best of all, it looked safe and easy. Unfortunately, this perception is not true. No matter how sophisticated the world becomes, warfare will never be safe, easy, or sterile. War will be dirty, bloody, dangerous, and very, very difficult.

America's Army is committed to using information age technology to provide a rapid and accurate common view of the battlefield to the combined-arms team. The mounted force was the first to appreciate the value and importance of applying advanced technology to all elements of the combined arms team to make combat operations more effective. The Army will field the best equipment money can buy to win on the battlefields of the 21st Century. But at the same time, we must understand that advanced technology alone will not solve all of our problems. I believe that the best weapon available to the mounted force is one that already exists between the ears of our soldiers — the brain. A trained and educated mind is the most important weapon on the battlefield today and will be well into the future.

It is easy to be impressed by the technology of the M1A2 Abrams tank. Its accurate main gun, its thermal sights and computerized fire control, its powerful engine, and its digital architecture are the best in the world. But, without the four crewmen who have the knowledge, courage, and desire to close with and destroy the en-

emy, all of the attributes of this great fighting machine will be wasted.

Machines are tools, and tools are only as good as the minds that guide them. Even a Cray supercomputer cannot tell its operator that he asked the wrong question, or is using the answer in the wrong way. The words and symbols on the IVIS screen cannot convey emotions, urgency, fear, pain, weariness, or excitement.

The mind of the tank commander must convert the information that his IVIS screen provides into action, based on the situation and his commander's intent. The capabilities resident in advanced technology combat platforms can only influence the situation when the crewmen think and take action. We in the mounted force must recognize the requirement for the long-term development of brain power in order to prepare for the challenges of future operations. Our warfighters must develop new technical-tactical skills to master the many new nuances of digital warfighting.

Mastery of warfighting on the next battlefield will require new ways of thinking and operating, in part, because everyone in a digital organization will have the information to make and execute tactical decisions. The situational awareness that comes with increased information flow enables truly decentralized execution. This increases the need for individual imaginative thinking and initiative. The more sophisticated our machines become, the more important it is that we pay attention to our primary weapon — the minds of the soldiers that guide these machines. Only then will we optimize our weapon systems.

Technology bridges the gap between our unaided abilities and a given task. Adapting technology for mounted warfighting results in being able to perform tasks better and faster, and more importantly, performing tasks that were previously impossible. Our greatest challenge today will be to identify and train on tasks that before were impossible to perform.

A laser rangefinder is an example of how technology takes an existing task and makes it easier. The physical task itself — measuring the distance to the target — has not changed. However, the technology simply makes it faster and more accurate, and requires less effort from the crewman. The ability to range to a target and then transmit that information directly to an artillery piece or to a wingman instantaneously is an example of a task that was impossible to do previously, but which can now be performed in minutes. The trick is to understand where and how to apply this capability to tactical situations...to understand the possibilities for a better way of fighting.

For the first time ever, current technology permits a friendly force commander to know precisely where his unit is in relation to other friendly and enemy forces on the battlefield. Before now, this had been so difficult and time-consuming that we used pre-arranged control measures — unit boundaries, directions of attack, limits of advance — to keep ourselves organized, because it was impossible to see the battlefield *in real time*. Information age technology gives us the capability to see the battlefield in real time. Now, instead of controlling units to operate within rigid, pre-determined boundaries, we have the potential to move units over multiple routes to attack an enemy from many disparate locations. The possibilities for future combat operations given such capabilities are limited only by our intellect.

Nothing can take the place of thinking soldiers on the ground who understand how to use their equipment. Equipment may fail; but, minds can improvise, make allowances and adjust. War is a contest in which the side with the wits and will to win will prevail. We clearly have the best equipment on the battlefield. Our strength as an Army and our success on future battlefields will depend on how well we can train our minds to use this equipment. We must prepare our leaders' minds to fight on the digital battlefields of tomorrow...

CSM Ronnie W. Davis
Command Sergeant Major
U.S. Army Armor Center



Consolidation “A Vision Realized”

To train tank commanders or cavalry scout section sergeants/squad leaders to be technically and tactically proficient in skill level three tasks, to fight, maintain, train, and sustain their crew/section and to perform duties of a tank commander or scout section sergeant in armor/cavalry units. This purpose is the first item in the CMF 19 Basic Noncommissioned Officers Course (BNCOC) program of instruction (POI). Starting in the fourth quarter, FY 96, all 19D/19K sergeants (P) will attend BNCOC only at Fort Knox, Kentucky, which is a big change in the current way we train our NCO leaders. Through consolidation, Fort Knox will be keeping in step with the Army's school philosophy of “One Course, One Standard, One Army.”

The consolidation effort has been an ongoing project and supports the downsizing of the Army and the Armor Force. With BNCOC consolidation effective in the fourth quarter, FY 96, the vision has become reality. Just four years ago, seven external academies and Fort Knox trained CMF 19 soldiers. Due to the end of the Cold War, downsizing, and budget cuts, armor soldiers stationed in Europe since October 1993 started attending BNCOC at Fort Knox. Gradually, four other academies closed and divided their student load among the other existing academies. When the decision was made to consolidate at Fort Knox, there were only two external academies and Fort Knox still operating.

Consolidation of the CMF 19 BNCOC at Fort Knox enhances standardization of training and allows the Army to keep the school portion of a

soldier's training within TRADOC. The necessary ammunition and equipment is available to support hands-on instruction. A solid instructional base exists, and adequate space is available to house the BNCOC student. A big advantage to students will be in the area of simulation. The Battle Lab, SIMNET, and Test Bed allow the students to become exposed to state-of-the-art simulation training unavailable anywhere outside of Fort Knox. The young soldier will receive a comprehensive and challenging course. This will relieve budget constraints on organizations that previously sponsored academies. To assist Fort Knox in the success of BNCOC consolidation, units ensure that selected soldiers are, in fact, the correct soldiers.

Fort Knox has the ability to train 48 19Ks, and 32 19Ds, per class with 10 classes scheduled for the upcoming year. The class dates for the remaining portion of FY 96 and FY 97 follow:

BNCOC CMF 19 FY 96

Report Date	Start Date
21 Jul 96	22 Jul 96
11 Aug 96	12 Aug 96
FY 97	
1 Oct 96	2 Oct 96
23 Oct 96	24 Oct 96
5 Jan 97	6 Jan 97
26 Jan 97	27 Jan 97
9 Mar 97	10 Mar 97
30 Mar 97	31 Mar 97
11 May 97	12 May 97
1 Jun 97	2 Jun 97
20 Jul 97	21 Jul 97
10 Aug 97	11 Aug 97

Note: The 19D and 19K classes start simultaneously, so only one start date is listed.

Forecasting soldiers for attendance at BNCOC is primarily the responsibility of individual units. Future plans are to forecast soldiers using a centralized method similar to the procedure used to select soldiers for ANCOG. Those soldiers selected must be in a promotable status when they arrive at Fort Knox. They should be in the best possible physical condition, possess no temporary profiles, and meet the other prerequisites necessary for attendance at BNCOC. To ensure that the school fills all seats, a unit should identify a primary and alternate attendee for each course. This will eliminate unit shortfalls and allow the academy to keep a steady flow of graduates moving into the field. In a downsized Army, this will be a key to the success for both the Army and the soldiers concerned. If a unit or soldier is having difficulty getting a school seat, contact one of the following points of contact (POC) for assistance:

- FORSCOM HQ, Mr. Grady Hammock, DSN 367-7035
- PERSCOM, Ms. Dorine Hagarman, DSN 221-8693
- National Guard, Mr. Jim Coats, DSN 327-7339
- G3 Schools (Ft. Knox), SGT Mann, DSN 464-3255

If you are within the 30-day window prior to a class start date, contact AR School HQ, Ms. Carol Hickok, DSN 464-3585.

Continued on Page 49

BALKAN REPORT II

Off-the-Shelf Wheeled Armor Proves Its Worth In Macedonian Winter

by Captain Matthew D. Morton



Two Finnish SISU 6x6s team up to extract a bulldozer mired in the Macedonian mud.

Much has been written in recent editions of *ARMOR* about the versatility and unrealized potential of the M113A3 in Operations Other Than War (OOTW). Our joint task force, referred to by the UN as USBAT, used them as the only form of armored transportation (unless you count our limited number of armored HMMWVs as armored vehicles) in the United States sector of the former Yugoslavian Republic of Macedonia (FYROM) while conducting peacekeeping operations. The M113 worked well in the valley floor around Camp Able Sentry, our task force headquarters, but was of little or no use at our OPs. What our soldiers really needed was a wheeled armored personnel carrier to fill the role for which our M113s were not appropriate or capable. A better tool for the job would have been the LAV-APC.¹

I am not suggesting a change to the TO&E for any of the organizations in the current Army structure. What I am suggesting is this: If a **mechanized** infantry battalion can deploy from Germany without their M2A2s and fall in on equipment already in place, why not add a complement of LAV-APCs when the terrain, weather, and situation make it a better tool than the tracked M113? Obviously, it was not a stretch of the imagination for a smart planner to make sure our OPs were equipped with Small Unit Support Vehicles (SUSV), best described as similar to the type of

snow caterpillar seen on ski slopes, to aid us in accomplishing our mission in mountainous, snow-covered terrain. The LAV-APC would be another welcome addition in this environment and in other peacekeeping missions as well.

While deployed, our company's mission was to observe, monitor, and report any activity along the Northern Limit Area of Operations (NLAOO),² which could undermine confidence and stability in FYROM or threaten its territory. Our company manned USBAT sector east (see attached map). We accomplished our mission from a series of fixed OPs, which looked into Serbia, and with regular patrolling, both mounted and dismounted. Our sector was marked by extreme mountainous terrain with only one major hard-surfaced highway which ran from Kosovo to Bulgaria in an east/west direction. All of our fixed OPs were located more than 20 kilometers north of this highway at the end of small, unimproved roads that transitioned to small dirt tracks as they approached the NLAOO. Winter weather proved extreme. Four- and five-foot snow drifts were not uncommon during the months of January, February, and March. We received our last snowfall in May. Terrain and weather were daily challenges to mission accomplishment and force protection.

Patrolling supported accomplishment of the mission and provided a vehicle for showing our presence to the local

citizens on a daily basis. Showing a presence is an important aspect of any OOTW mission. We were able to accomplish the majority of our mounted patrolling with HMMWVs and occasionally SUSVs when weather did not permit the use of our wheeled vehicles. Rubber tires and the rubber tracks of the SUSV did no damage to the nearly non-existent network of trails and unimproved roads found in our sector. Had we been forced to use tracked M113s, M2A2s, or M1A1s, the fragile road network never would have lasted. Certainly the civilian population would have been displeased had we destroyed their already limited infrastructure, not to mention a rapid inability to supply our own OPs along these same fragile supply lines. Unlike fast-paced maneuver warfare, in which we hope to achieve rapid and decisive victory, the OOTW environment demands that we use the same infrastructure and deal with the local populace for an extended period of time. Planning to let follow-on forces deal with the people and improve the MSR is no longer an option.

Our soldiers safely accomplished their mounted patrolling missions from unarmored vehicles. They were able to do this because of the total lack of mine activity and violence in FYROM. This may not be the case in other OOTW areas of operations, and could have changed in our area during the course of our deployment. Increased protection would be desirable in a more



threatening environment. The ability of light and heavy tracked armored vehicles to move in the places that our troops patrolled was not an option for our company. Tracked armored vehicles quickly become unstoppable sleds on ice and snow. Riding an 11-ton sled off the edge of a steep mountainous road is not a prospect many of us relish. A 30- or 60-plus-ton sled is an even worse thought. In fact, we had an M113 slide off one of our OPs. It came to rest only after it slid into a group of trees. We recovered this vehicle using a technique taught during the Armor Officer Basic Course. The perimeter wire was reduced to allow the M113 to drive back onto the OP from a less acute slope. This would not have been an option on any of our other OPs. We tried removing track pads to improve traction, but with only minimal success. In our environment, we were left with no armored alternative. Had there been a greater threat, this would not have been acceptable. Our Army may easily find itself in a similar environment but facing a greater threat than we faced. Armored protection would be required to protect our force. Wheeled APCs can meet both the force protection and mobility requirements.

There is another less tangible aspect of patrolling worthy of note.

How many times has the media misidentified a tracked APC as a tank? The mere mention of a tank takes the psychological aspects of an operation to entirely different levels. The tanks at Tianamen Square never had to fire a shot to send a very serious message. No, an M113 is not a tank, but the difference between an M113 and a tank is much less obvious to a civilian than to a professional soldier. The difference between patrolling in tracked armored

vehicles and wheeled vehicles would not have been lost on the civilians living in our sector. Certainly there will be times when some degree of protection is required, but protection should not be gained at the expense of the local population's attitude toward our presence. Wheeled APCs provide that option.

Our task force was not equipped with LAV-APCs, but our sister battalion, NORDBAT,³ was equipped with the SISU XA-180, from Finland. This 6x6 APC is capable of carrying 10 soldiers with a crew of two. It is amphibious, though I never saw this capability used during our six-month deployment. The welded hull is designed to stop small arms and shell fragments. It sported a 10 metric ton winch with 50 meters of 16mm cable. Its listed road speed is 100 KPH. On occasion, I was passed by SISUs while traveling at highway speeds in my HMMWV. Cleated snow chains extended the mobility of the XA-180s operating in our sector. Chain usage had no noticeable effect on the limited number of hard-surfaced roads. This is probably because they were rarely used anywhere in our sector except under the most extreme off-road conditions. SCANDCOY⁴ soldiers operating in our sector did comment that the XA-180 did not handle particularly well on snow and ice, and that they too were forced to slow down. The important thing is that they were still moving with armored protection under conditions that stopped our HMMWVs.

Before citing examples of the XA-180 in action, a basis for our ability to



At upper left, a SUSV that left the road in a severe snowdrift and overturned. No one was injured, a SUSV takes to the air on helicopter sling.

insert the LAV-APC into similar situations should be established. The LAV-APC is an 8x8 vehicle capable of carrying eight soldiers and a crew of two. It, too, is amphibious. Its armored hull provides protection against small arms and shell fragments. Its standard winch is not as heavy as the XA-180's at 15,000 lb. The listed road speed is 100 KPH, and it can be equipped with snow chains. A machine gun mounts at the commander's station. It weighs less than the XA-180 by 2,000 kg, and it has both power steering and power brakes. Best of all, it is field tested; logistics requirements already exist, and a cadre of experienced operators can be found inside our military, the United States Marine Corps. The LAV-APC is not exactly the same as the XA-180, but close enough that the following examples of the XA-180 in action should also apply to the LAV-APC.

As mentioned before, the poor infrastructure made resupplying our fixed OPs extremely difficult. Small roads and tight turns, which had collapsed on

more than one occasion, made the 5-ton truck (we had multiple series) “king of logistics. The HEMTTs we did have in FYROM were used to refuel our helicopters at Camp Able Sentry. Because of the many tight turns on already narrow roads, even our 5-ton trucks were forced to make a series of forward and backward movements to negotiate the curves on some roads. Heavy snow at our higher elevation OPs forced us to use helicopter sling loads, or more commonly sending the SUSV down to meet the LOGPAC and make multiple trips from an LRP to the OP and back.⁵ This was time-consuming and inefficient. We also supplied one SCANDCOY OP located in the exclusion zone,⁶ atop the highest mountain in our sector, 1703 meters. They also shuttled fuel and water with their SUSV, but they also had the use of their XA-180. A water blivet fits nicely in the back of the XA-180. Our M113s were immobile when the weather required this technique; their APCs were productive, and if the THREATCON had ever risen, they would have provided their soldiers with protection to and from the LRP.

Our engineers worked non-stop trying to improve the trail to the lone SCANDCOY OP in our sector. The bulldozer which did much of this road improvement was also responsible for assisting the LOGPAC trucks up some of the steeper hills on the days they traveled all the way to the OP. Unfortunately, the bulldozer became fender depth mired in a spring hidden beneath the snow. Two XA-180s with their 10 metric ton winches, three snatch blocks, an additional length of cable, a whole lot of timbers, one very squared away NCO with years of service at Ft. Greely, Alaska, and a Swedish infantry captain extracted the bulldozer in a day. There were no M88s in country, not that it mattered, for an M88 couldn't have traveled the 60+ kilometers to the OP in January from Camp Able Sentry. SUSV winches are for self-recovery only. Our HEMTT wrecker would have had a hard time getting to the OP under the winter conditions we were experiencing. Even if our HEMTT wrecker made it to the scene, it only would have made it there with its one winch.



A HMMWV in deep mud just south of the buffer zone.

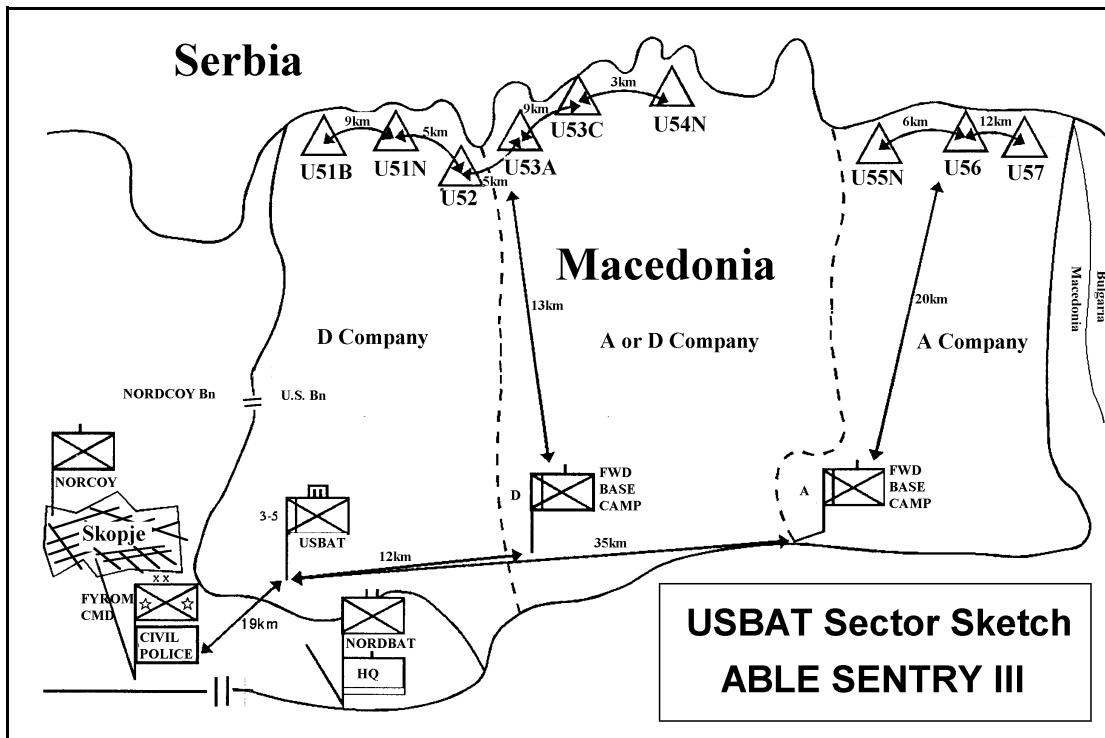
Moving two forward-deployed, winch-equipped APCs is easier and provides a more flexible response than bringing a resource in great demand and short supply⁷ to the farthest limit of the sector when, with the right tool, infantrymen, tankers, scouts, and engineers could solve the problem with limited additional resources. The XA-180 winches pulled other vehicles back onto the roads on other occasions. An LAV with its 15,000-lb winch is just another tool which would give our troops more self-sufficiency. An LAV-R mounts a 30,000-lb winch and, in an OOTW environment, affords its crew more protection than a HEMTT wrecker.

Our OPs rotated personnel every 21-days. Once in the rear, they served on the Quick Reaction Force, the guard force, or took their UN pass. Our rotation of squads took place by exchanging one fire team at a time by air or ground extraction. This process was often complicated when an OP's HMMWV was deadlined, which required the lateral movement of vehicles across the sector.⁸ The SCANDCOY soldiers rotated on a weekly basis, using their XA-180 to rotate an entire squad at a time. Had our troops been equipped similarly, the contortions we went through would have been greatly reduced. The average OP during our operation was a squad — nine infantrymen and one medic. The LAV-APC carries 10 sol-

diers. Imagine this: Incoming squad mounts up and moves to sector in its own vehicle, the same vehicle just used on the QRF or guard force. Incoming squad arrives, is briefed on current situation, conducts joint inventories, and maintenance checks. The outgoing squad mounts up in **its own APC**, and drives to the rear. Rotating on and off of equipment is something no one likes. It is very hard to establish a sense of ownership when that ownership is only for 21 days at a time.

Our Quick Reaction Force was equipped with HMMWVs and M113s. The QRF rehearsed to insert in support of an OP by air, UH-60, or ground. It wasn't uncommon for Camp Able Sentry, located next to Skopje international airport, to be fogged in when the weather was perfectly clear out in sector, or vice versa. Anyone who has ever depended on helicopters has at some time been disappointed (our pilots, both UN and U.S., were very capable and very dedicated). This leaves HMMWVs and M113s. By HMMWV, under **ideal** road conditions, the drive to our closest OP took at least 2½ hours. This isn't quick by any standard, and to still be arriving in a light-skinned vehicle probably is not the best idea if the situation demands the deployment of the QRF. The LAV-APC provides the mobility and speed of a HMMWV and the protection of an M113. A QRF equipped with the LAV-25 would be an extremely lethal force in many OOTW scenarios. In the context of the large frontages our task force had to cover, and many OOTW situations may demand, I will not even discuss how long it would take an M113 to make the trip out to sector.

Those who would argue that another type of vehicle would strain our logistics system even more may be right. Yet, none of our mechanics had ever worked on a SUSV until we deployed, but somehow they managed to keep our fleet up and running. Of course, when the Air Force could not land with our sustainment packages of Class IX, our mechanics found a way to local-purchase the required Mercedes parts⁹ for the SUSVs and glow plugs for our HMMWVs. Yes, I think our 63s and 45s can handle the additional task of



diesel fuel resupply on a weekly basis. Large fuel tanks were also required to refill HMMWVs, SUSVs, and any engineer vehicles that might be temporarily operating from a forward OP. All water used to support our on average 10-man OPs was brought up during LOGPAC. This provided our soldiers enough water for cooking, personal hygiene, and about one shower per week. Class I resupply was conducted from an M998. All rations were issued in bulk and prepared in kitchen CONEXs by infantrymen on our forward OPs.

working on a LAV instead of spending their time pulling services on an M113 that never leaves the perimeter. The Air Force supplied our joint task force with an Air Force NCO to run our mail room. Certainly the Marines could provide a knowledgeable mechanic, even if only on a temporary basis. Civilian contractors flew in to apply Modification Work Orders (MWOs) to our HMMWVs. Our task force also had a full time Logistics Assistance Representative, who helped us maintain our equipment readiness. Logistics should not be the excuse used to keep this valuable tool out of the hands of soldiers who could really use it.

The wheeled APC isn't the answer to all the problems that will face our troops in OOTW. It is another tool which will allow our soldiers to do more with less. If we can put together these packages of equipment that our task force fell in on, certainly we could add a useful tool to the package. OOTW continues to present us with new problems which require innovative thinking, or in this case not so innovative. Many of the places our troops have already gone were not conducive to heavy armor for a variety of reasons, to include terrain, weather and political considerations. We have also been to places where we did not have the right tool at the right time, and our dependence on someone else to provide it cost us dearly. The LAV is a tool already on the shelf. It comes tested, with a cadre

of experienced NCOs and officers to teach us how to use it.

The flexibility of our Army is unquestionable, and it always finds a way to accomplish the mission. As our missions become more diversified, the soldiers in the field deserve the best equipment to accomplish the mission. The LAV-APC would serve the Army well, and in the type of mission we are currently performing in FYROM, it is much better than the M113. Missions like Operation Able Sentry will continue, as will the demand for vehicles which afford more protection than the HMMWV, yet not all that is encompassed with the use of armored tracked vehicles. Fortunately, we already have the compromise in the form of the LAV-APC; all we have to do is use it.

Notes

¹The LAV comes in a variety of configurations. For the purpose of my article, I will focus on the LAV-APC, not the LAV-25.

²Consider this the unofficial border between Serbia and FYROM. For political reasons we did not refer to it as a "border."

³NORDBAT was composed of two Finnish companies, FINNCOY 1 and FINNCOY 2, and one company composed of platoons from Norway, Sweden, Denmark, and Finland, SCANDCOY.

⁴See Note 3.

⁵All electricity on our OPs was generated by 60 kw and 30 kw generators, which required

⁶The exclusion zone was a small portion of our sector where no Serbian or FYROM soldiers were permitted to patrol. OP U55A was located in the middle of this zone atop hill 1703. During our rotation, it was only manned by SCANDCOY soldiers. Our task force supplied the bulk of their logistics needs and conducted multiple OP improvements. Our company was responsible for tracking all operations and patrols at U55A.

⁷HEMTT wreckers were useful: they moved dragon teeth at Camp Able Sentry, moved Milvans into holes during OP improvements, recovered vehicles throughout the task force sector, and provided overhead lift for maintenance operations.

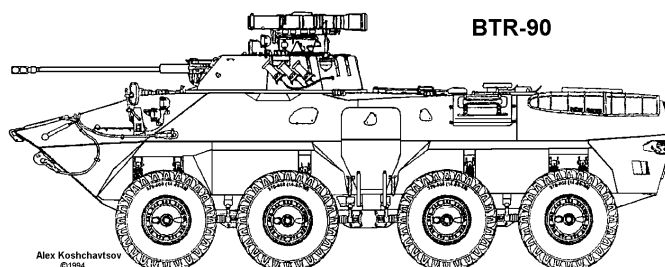
⁸Though our OPs were relatively close in terms of east-to-west, straight-line distance, almost all lateral movement took the form of moving south to the one hardball road, moving laterally and then moving back to the north. The result? A 6k distance turns into a 4-hour round trip just inside the sector.

⁹NORDBAT and SCANDCOY used Volvo engines in their SUSVs.

Captain Matthew D. Morton is a 1991 graduate of the U.S. Military Academy. His previous assignments include tank platoon leader, 2/11 ACR; BMO, 3-5 Cav (Mech Infantry); and rifle company XO, TF 3-5 Cav, Operation Able Sentry III. He is currently stationed at Ft. Polk, La.

In the Eyes of This Analyst

by Sergeant First Class Willis A. Bullard



Drawing used by permission, Jane's Information Group

During the past decade, the intelligence community has been inundated with rumors of a dissolving worldwide threat. With the fall of communism in Eastern Europe came a resounding sigh of relief from many analysts who, just the week before, were trying to keep up with the limitations and performance characteristics of Soviet-made equipment. The uncertainty of the fall of communism led to a lack of focus for intelligence collection. Our mission in Europe has been drastically altered, while other units continue to determine which direction their intelligence should lead them. Well, the tragedy is to ignore intelligence.

A viable threat still exists throughout the world. No, we cannot pinpoint this threat in terms of which army is invading which country, or whom our nation will fight next, but we can point a strong finger at the continuous production and improvements of combat weapon systems. Countries that were once enemies are drawn together in the arms market, making business deals for weapons purchases. Turkey has recently ventured into the market, buying both Soviet and Brazilian equipment. In ten years, what kind of equipment will we and our allies see emerging from our potential foes' arsenals and armories? Countries with little to no financial stability have found themselves tempted by reasonably-priced equipment now on sale by the Former Soviet Union (FSU). Not to be outdone, countries not so eager to make a buck," but to retain market share, have matched the prices of the FSU manufacturers in order to remain competitive in the world arms trade.

In the last five years, we have seen the introduction of many Russian-built weapon systems into the arms market. From the SA-15 TOR, a sophisticated surface-to-air missile system, to the newest armored fighting vehicle, the BTR-80A. Yes, the BTR-80 armored personnel carrier now has a variant described as a fighting vehicle.

At first glimpse, I thought that someone had modified a BRDM. From the front you see a low-profiled wheeled vehicle not too unlike the BRDM. After a closer look you can see the distinctive body style of the BTR-series vehicle: a pointed nose with splash plate on top, rather than folded underneath like the BTR-60, two windows with hatches that open upwards for the commander and driver, with a searchlight just above the commander's window (great target identifier), a full-sized door located between the second and third axle with a swing-out step for easier entry and exit than in the earlier BTR-series vehicles, and, finally, the familiar exhaust system on the rear that lies parallel to the ground (an identifying feature that separated the BTR-80 from earlier versions of the vehicle). But then you see some small, almost unnoticeable differences. On the right side the vehicle, just below the exhaust system, is an unidentified box. Just to the right of the commander's window is a cylindrical object that I believe to be a ventilator, similar to that found on the turret of the original BTR-80.

And then the greatest difference — the lack of the traditional BTR turret. The BTR-80A has a new one-man turret with an

externally-mounted 30-mm automatic cannon which is presumed to be the 2A42, the same gun found on the BMP-2, and a 7.62-mm PKT machine gun. The turret is capable of traversing 360 degrees and can be used against both ground and air targets. Basic load for the 30-mm cannon is 300 rounds, and the gun should have a maximum effective range of 1000 meters against ground targets, although it can be sighted out to 4000 meters. There are two automatic rates of fire for the 2A42 gun, low at 200 to 300 rounds per minute and high at 500 rounds. The 7.62-mm machine gun has 2000 rounds available. The introduction of a 30-mm cannon to this familiar armored personnel carrier does not, in my opinion, make it a fighting vehicle. It does, however, nullify one of the BTR-80's shortcomings as a survivable system on today's battlefield. It provides additional protection and fire-power support for personnel getting in and out of the vehicle. Standard equipment includes a central tire pressure system that allows tire pressure adjustments from inside the vehicle, night vision equipment, and firing/vision ports for its eight passengers. The BTR-80A is fully amphibious and propelled by a single waterjet at the rear. It maintains a water speed of 10km/h like its BTR relatives. Power is supplied by either a KAMAZ-7403 diesel with 260 horsepower or a YaMZ-M2 diesel with 240 horsepower, both capable of achieving a maximum speed of 90km/h.

This system, revealed last year, is in service with the Russian Army and is available for export. Many countries lacking formidable infantry fighting vehicles (IFV) can feasibly use this system as their battlefield mainstay. The BTR-80A's amphibious ability can also be a boost to the inventory of nations planning for or expecting maneuvers in marshy areas. This system, like most wheeled systems, unfortunately does not have the mobility of a tracked vehicle. Cross-country movement is more difficult and slow, compared to tracked counterparts such as the BMP-series IFV.

An important question to consider is whether earlier versions of the BTR-80 and the other BTR-series vehicles will be retrofitted with this armament. Is the BTR-80A going to replace or complement the Russian Army's current BTR fleet? There is now worldwide interest in the vehicle. The BTR-80A has recently been exhibited and demonstrated in the United Arab Emirates (UAE) and Turkey (which acquired the earlier BTR-80 from Germany and Russia). But this is not the end of the BTR line. Just last year the Russians unveiled the BTR-90, which combines the BTR-80 body with the turret of the BMP-2, including the AT-5 antitank missile system. In the eyes of this analyst, the Cold War may be over, but I believe it was just a precursor to the opening of a warehouse of trouble.

SFC Willis A. Bullard is a Middle East analyst at the Defense Intelligence Agency. He previously served as a Technical Intelligence Analyst with C Det, 203rd MI Bn, National Training Center, Fort Irwin, California.

LEADERSHIP

on the Digital Battlefield

by Colonel (Ret.) Bruce B. G. Clarke



The armies of the world are currently struggling with the strategic and tactical implications of digital technology. The United States Army is finally fielding the M1A2 tank with its Intervehicular Information System (IVIS); the Royal Saudi Land Forces were the first to have a battalion in the field with the M1A2, and other nations are trying to catch up with similar systems that are not as sophisticated. In each case, military leaders are struggling with the implications of digital technology and the information that it may make available to field commanders.¹ Some see this change as evolutionary, others as revolutionary. Those that see it as evolutionary are more willing to struggle with the issues that always accompany such a transition. Those that see it as revolutionary are more prone to see the information sky as falling on them.² In actuality, reality is somewhere in between. This essay will attempt to show that the digital battlefield is not something so new that command and control, i.e. leadership, is different on that battlefield. To think the opposite is a fatal mistake. It will also be fatal for the commander who tries to micromanage his unit or forgets the tenets of leadership.

The Political Nature of War

Before discussing leadership on the battlefield, one must understand why soldiers are on the battlefield — to force an opponent to change his political objectives to accommodate ours.³ The true challenge is to translate political goals into militarily achievable objectives. Digital technology and instant communications may facilitate this process by allowing for the rapid transmission of observable intelligence. It will neither replace human intelligence nor perform the analysis that is necessary for the determination of centers of

gravity and achievable objectives. These are mental processes that are dependent upon subjective, rather than objective, analysis.

If we are not careful, we will forget the entire objective of warfare. For example, a recent edition of the *Army Times* reported that the probability of victory was listed at between “51 and 85%” based upon the casualties that are expected to occur in a war in Southwest Asia in the year 2001. In his book, *On Strategy*,⁴ Harry Summers tried to convince future military leaders that the whole concept of body count was useless. In his work, he quotes a North Vietnamese colonel as saying that the fact that the North Vietnamese Army lost every battle, measured in body count, was irrelevant to who won the war.

The key to victory is for the strategist to synchronize the elements of power so that the opponent sees more to gain (less to lose) by changing his objectives to accommodate ours. As Summers pointed out, this will to resist cannot be calculated in casualties (body count). It is an intangible piece of the strategic calculus and thus not susceptible to digital manipulation.

A classical example of where a force won the war and lost the peace is Finland in the Russo-Finnish War. The Finns won every battle and inflicted casualties at the rate of about 40 to 1, but lost. Additionally, the final terms were more odious because of their success on the battlefield. So much for body count and for our ability to “calculate” victory. Therefore, when we talk about “victory,” we should not link it to casualties or exchange ratios. We should talk about the achievement of political objectives. In future wars, digital technology can assist in achieving such a victory, but not by replacing classical strategic/political-military thought.

Future Warfare

To understand the application of digital technology to the battlefield one must also understand the nature of future war. Except in the Mideast or the valleys and mountains of Korea, warfare in the future will be characterized as geographically isolated events on a highly dispersed battlefield of small unit actions — platoons and companies. The battles of the Fulda gap or the North German Plain are a thing of the past. Even the potential for Desert Storm-levels of conflict has been minimized by the cost of waging war. Armies of the future will be unable to afford the mass formations of the attrition warfare of the past. They will be reduced in size, though not necessarily scope (because of technology). The warfare of Frederick the Great, characterized by maneuver for strategic advantage so as to “win” with minimal casualties, will be the warfare of the future. Mass will be achieved by fires and movement over much larger areas by numerically smaller forces. However, in many cases the superiorities — information, accuracy, decision speed,⁵ etc. — offered by the situational awareness made possible by digital technology may allow for overwhelming force to be achieved without overwhelming numerical superiority.

This warfare of maneuver will be focused on strategic objectives.⁶ It is critical to again note, at this juncture, that every battle and action should contribute to the achievement of the political objective.⁷ It is this focus that the battalion and brigade commanders should provide. In the few cases where division flags may be on the battlefield, this will be even more true.⁸ These commanders’ purpose will be the translation of broad political-military objectives into tactical missions and the maintenance of focus, while minimizing casualties. It cannot be the over-

pervision of the tactical employment of platoons and vehicles that some fear.⁹

Given the coalition nature of most future conflicts, the battalion and brigade level commanders will spend a significant amount of time working the multitude of problems that will come with such relationships. They must also work to provide focus and unity of purpose with forces that may not be digital, or whose digital system may not integrate with their own.¹⁰

In short, the division or brigade commander of the future will have a multitude of new tasks — but they will not be purely of an informational nature, as some have suggested.¹¹ The commander will have his hands full providing military objectives that are in consonance with the political goals,¹² the resulting focus, maneuver guidance, and coalitional support.¹³ He will be too busy to over-supervise. The new demands of the expanded horizons and variables of the “battlefield” will preclude over-supervision.

METT-T and the Digital Battlefield

Once one understands the above, one must still deal with the battlefield reality of overcoming the opponent’s military will to resist so that he will change his objectives to accommodate ours. Winning the battle, as long as it is in fulfillment of the political objective, is where digital technology is truly applicable. Technology may allow the commander to more accurately accomplish his mission and enemy analysis. He may have more visual and electronic intelligence on the enemy and an increased appreciation of the terrain. He may have an “accurate” picture of the physical status of his own troops. But, he will only have a true comprehension of his own troops’ morale and well-being by interacting with them. This is what true leaders do. It is in this subjective area that leadership will remain critical to success on the battlefield. The abilities discussed in several articles¹⁴ of information management and other technical skills will in fact be important, but leadership will remain critical — not the ability to manage or manipulate data, but the ability to relate to and motivate soldiers to operate the machinery of war, the machinery critical to the conduct of massed, accurate fires, and the delivery of digitally controlled munitions.¹⁵ Digital technology may allow for a compression of time if

one side’s capability is superior to the others.

A commander’s ability to know his enemy and his own ability to collect and process information, and then exploit that information to deliver highly accurate fires, will be critical. If the enemy is also capable of collecting, processing, and acting upon such data, leadership and initiative will be the critical differences on the battlefield. The company commander who exercises initiative because he understands the commander’s intent and the focus of the campaign will bring success, while the company commander who waits for overly detailed instructions will be contributing to the defeat of his unit by surrendering the initiative. A sophisticated enemy will also cause increased dispersion to avoid creating too lucrative a target. The unit will mass as Frederick did at the strategic time and place. This much more fluid battlefield is both a result of, and a survival necessity of, digital technology.

When one gets to the turret, where the massing of forces and/or fires will truly occur, leadership will continue to be the decisive factor. The leader at the head of his company or battalion will know whether the data in the digital report on his screen is accurate and timely.¹⁶ He will also appreciate the rhythm of the battle and be able to cut through some of the fog of war. This is a critical point. Many pundits seem to assume that digitally generated data will eliminate the fog of war. This is not true. The data that is available to the commander will be as accurate and timely as the sources of the data and the ability of the opponent to manage, confuse, obfuscate, or deny that data. The current discussion assumes away these considerations. The fog of war may be different, but it will still be there, and both sides of a fight will be seeking to increase it on their opponent’s side, while reducing their own. This is the information war that the Tofflers talk about.¹⁷ At the battlefield level, it is not a new phenomenon — it is simply a repackaged one. The battlefield commander has always sought to deny the enemy information on his own capabilities and vulnerabilities, while gaining and exploiting the opponent’s. What may have changed are the weapons that are available to do this.

On the battlefield, the leader also will be engaged in an informational struggle of a personal nature — sorting the rele-

vant from everything else. This sorting will be between digital information on a screen, down-linked images from battlefield visual sensors and, most importantly, his own observations and emotions. The sense of history and precedent that has made it possible for military leaders to take the initiative and make gutsy, but correct, decisions will not go away because of the advent of digital technology. Leadership and the personally evaluated factors of METT-T will remain critical for battlefield success.

Finally, as noted, it is the leader that must also consider his own vulnerabilities. This consideration takes on added importance as the opponent of the future gains a similar capability. The ability to target, confuse, mass quickly, disperse, and respond quickly will not be a one-sided set of attributes. Both sides may have them. At this point, it will be classical leadership, not the manipulation of data, that will determine success on the battlefield.

Conclusion

The successful military of the future will learn how to manage data and process it without becoming overly enamored with it, or enslaved by it. The great battlefield captains of the future will be students of history and leaders of men who understand the limits, vulnerabilities, and advantages that flow from digital technology. They will not forget the importance of the individual serviceman to the success of the unit. They will understand that, because something is displayed on a video terminal, it may still contain the fog and friction of war. Finally, they will have a greater appreciation for the political purposes of the conflict — not just the technical. The challenge for training future combat leaders is thus to ensure that they don’t become prisoners of a video screen full of data at the expense of realistic, challenging, dirty training.¹⁸ It is the exhausting tactical reality of a Ranger School or an NTC rotation where training for war occurs — not behind a video screen.

As the understanding of the dynamic relationship between battlefield events and political objectives matures, the combat leader of the future will need to be mentally flexible, technically competent, and physically prepared to meet these new challenges of what it means to win.¹⁹

Notes

¹MG Maggart, "Armor and Cavalry in Transition — Time to Inventory Your Tool Bag," *ARMOR*, Jan-Feb 1996. He argues that the tools of the future are currently not developed in formal instruction or unit training programs.

²CPT R.L. Bateman, "Force XXI and the Death of Auftragstaktik," *ARMOR*, Jan-Feb 1996.

³Bruce B.G. Clarke, "Conflict Termination: A Rational Model," *Journal of Conflict and Terrorism*. In this article, Clausewitz was referred to as highlighting the political importance of the meaning of winning.

⁴Harry Summers, *On Strategy*.

⁵Decision speed may be accelerated because of the ability to more quickly gather and transmit data, but also because of the lower levels (compared to classical military thought) that will be making the decisions — battalions rather than divisions, etc. See 12 below.

⁶Hooker, et al, *Maneuver Warfare: An Anthology*. In this work, the authors discuss maneuver warfare from several perspectives. The one point that emerges is the criticality of the commander's intent for providing this focus while allowing individual initiative to exploit the tactical situation.

⁷Manwaring, Olsen et al, *Managing Contemporary Conflict: Pillars of Success*. "End State Planning." In this chapter, I discuss focus. Focus is critical in the warfare of the future.

⁸In the authors view, future engagements will be fought by battalions and maybe a brigade that is part of a joint task force. In short, the division of today and yesterday will have evolved into a tactical formation in the Israeli model, capable of providing Command and Control of Joint Forces — the Joint Force Tactical Headquarters.

⁹Bateman, *op. cit.* CPT Bateman argues that digitization will result in the emasculation of the subordinate commander because of the tendency for higher level commanders to meddle in their jobs. CPT Bateman has done a service by beginning the process of pointing out why this should not happen. Hopefully, my future paragraphs will add to this fine effort. Those of us who experienced the stacked helicopters of the Vietnam War understand clearly the imbedded problems of such over-supervision.

¹⁰The integration of digital technology is turning out to be extremely difficult for the U.S. Army. Rather than apply IVIS or some form of IVIS to every radio-equipped component on the battlefield, they have elected to have every system have its own digital formats, routing matrices, etc. This is the source of much of the Army's difficulty. It should be pointed out that the routing matrix in IVIS, that controls the distribution of digital communications from every MIA2, may be the technical solution to CPT Bateman's emasculation concerns.

¹¹Maggart, *op cit.*

¹²Dave Jablonsky. COL (Ret.) Jablonsky has argued that the tactical, operational, and strategic levels of warfare will be compressed by digital technology. This may be true in the clas-

sical theater commander, component commander, corps, division, brigade, etc. levels of command because each level will be planning simultaneously based upon digital data. However, what we are arguing here is that there most likely will not be those intervening levels of command. The brigade commander will also be the ground component commander and his battalions will be operating over greatly dispersed areas in a semi-independent nature. Such a scheme is very similar to operations in an unconventional warfare situation. These forces will mass at least their fires when required, but will operate more autonomously the rest of the time. The force developer may see this as an opportunity to reduce the overall size of the force, while the student of the post cold war world will realize that there may be numerous such "small scale" operations occurring in multiple theaters at any one time.

¹³In the Vietnam War, there occurred a classic example of a division commander understanding and working at the interface between the political and military. On 1 April 1968, the First Cavalry Division, commanded by MG John J. Tolson, attacked along Highway 9 in northern South Vietnam to relieve the siege of the Khe Sanh combat base. Several days earlier, the division had received its next mission — to attack into the Aschau valley and relieve the pressure on Hue. Major Paul Schwartz, the division plans officer, had prepared a concept that included continuing the attack along Highway 9 west into Laos, turning south along the Ho Chi Minh Trail, destroying the trail in the process and then entering the valley from an unexpected direction, thus achieving tactical and maybe strategic surprise. The 1 April briefing to General Tolson was very brief. He turned to the assembled planners and said: "You obviously didn't hear the President's speech last night. He announced a partial bombing halt. What you are proposing is politically impossible."

¹⁴Maggart, *op. cit.* One can even make the argument that the young soldier entering the Army with his computer and data skills will need more traditional leadership skills and experiences, not a focus on these computer skills. This argument is based on the concept that the society is providing the digital skills and the military should develop the leadership skills.

¹⁵Massed fires is of course an artillery concept. But it is also the goal of synchronization and applies to Armor units as they maneuver to close with and destroy the enemy. CPT Pryor, "MIA2, Smart Ammunition, Time and Space Theory," *ARMOR*, Jan-Feb 1996. This article and the analysis that accompanies it proves two things: That the analytical techniques necessary to operate on the digital battlefield are already growing within the military, and that static, non-fog of war type of analysis referred to in the 18th footnote of this paper and elsewhere is already becoming prevalent. Though an excellent analysis and understanding of the tremendous capabilities that will soon be on the battlefield, the article displays the "bean-counter" mentality that this article is railing against.

This article does bring home the concept of achieving mass without numerical superiority and highlights the lack of OPFOR capability

analysis that can get a bean counter into difficulty.

¹⁶Every IVIS SOP or discussion highlights the requirement to initially submit a contact report verbally and then, once one has lased and engaged, to send the digital contact report.

¹⁷Tofflers, *The Third Wave*. The critical point that is missed in all the discussion of future warfare is the concept of fighting an opponent who has a different level (wave) technology. The third wave force must still be capable of fighting and winning against a second or first wave force. Guerrilla wars and large, low technology forces are not yet a thing of the past.

¹⁸Finally, should we allow leaders to become captives of the tube? If we do, we run several risks. The most important of which is the depersonalization of warfare. If warfare comes to be viewed as an impersonal process, it will be easier for leaders to get soldiers into wars and more of them will die. The exact opposite of what a true leader will do.

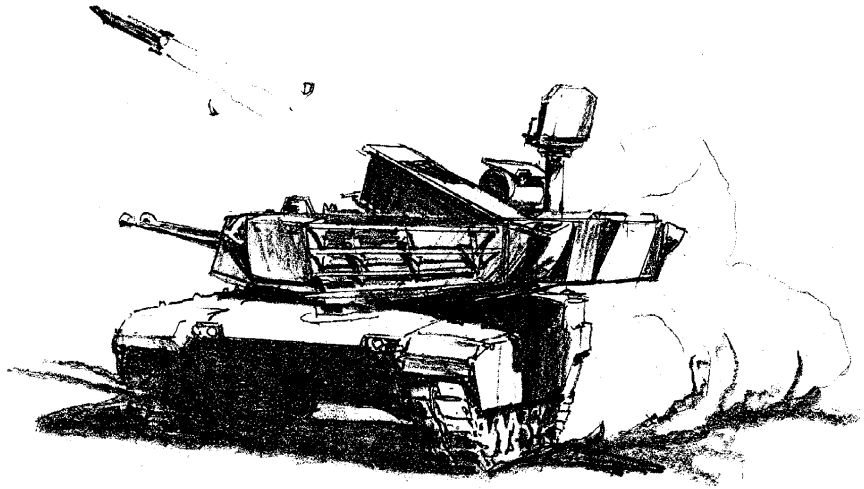
¹⁹Bruce B.G. Clarke, "Conflict Termination: What Does It Mean to Win," *Military Review*, November 1992, pp. 85-86.

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Forward Area Air-Ground Defense

Do We Need A Dual-Role Hybrid Air-Ground Defense System for the Armored Forces?

by Dr. Asher H. Sharoni
and Lawrence D. Bacon



Operational Requirements

Combined Arms Team (CAT) forward area armored maneuver forces are currently deficient in close tactical air and ground defense protection. The requirement for armored formations to be accompanied by self-propelled air-ground defense system (AGDS) vehicles, comparably mobile and ballistically protected, is nowadays widely acknowledged. Typically, air defense (AD) systems utilize radar-directed, light to medium gun systems or 'surface-to-air' guided missiles against a variety of aerial and ground targets.

Operational needs for an effective and crucial protective 'coverage' for the CAT have substantially escalated over the last two decades. The predominant rationalization is the proliferation of: a) ground-attack tactical fighter (fixed-wing, low-altitude aircraft) and antitank missile-launching, advanced attack helicopters; b) precision guided munitions (PGM); c) remotely piloted vehicles (RPV) and cruise missiles (CM); and d) a plethora of antitank weapon systems operated by armored fighting vehicles (AFV) or dismounted infantry.

A modern dual-role hybrid AGDS for the armored forces, at the brigade or division level, must be capable of keeping up with forward armored combat elements. Additionally, it *must* survive the extremely hostile 'armor vis-à-vis armor' intense battlefield environment. Consequently, an effective air-ground defense role may be accomplished by providing a timely and protective defense "umbrella" against most

antiarmor threats encountered in the modern battlefield presently and in the foreseeable future.

A highly-effective AGDS is characterized by:

- Cost-effectiveness in acquisition, procurement and operational deployment (affordable 'life cycle cost' -LCC)
- High operational availability and readiness
- Autonomous rapid fire control and weapon reaction
- Air/ground long-range target identification, acquisition, prioritization, and tracking with high 'hit and kill' probability
- Ammunition lethality and effective engagement range against all air/ground antiarmor designated targets
- All-weather, day/night, extended fighting capability
- Search and shoot 'on-the-move' overall capability
- Optimum crew ballistic protection, mobility and agility comparable to the M1-series tank

The typical advanced attack "tank-hunter" helicopter is predominantly perceived as a major, practically unchallenged threat to the armored forces. In fact, if the CAT is not equipped with effective antihelicopter ammunition or counterattack measures, it can do very little, if anything at all, to threaten and

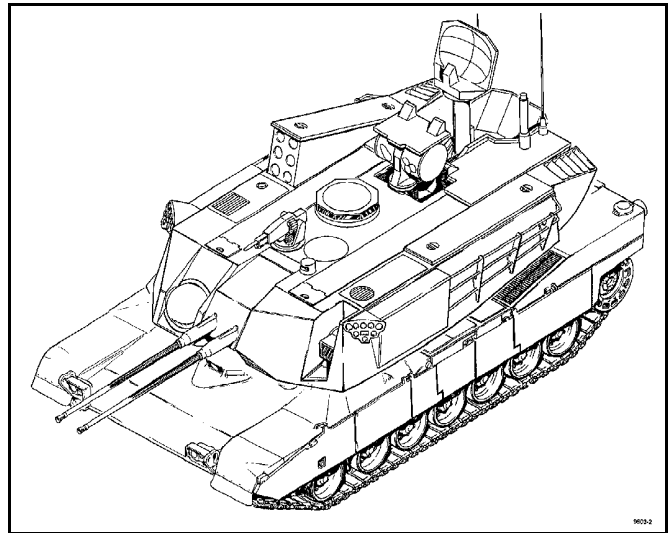
encounter this predator on equal terms. The reader will find it hard to conceive that one or two attack helicopters, effectively operated, may strike havoc, temporarily disrupt, and disable a whole armored formation if the latter is not provided nor equipped with adequate protection and effective countermeasures.

In addition to its enhanced capabilities against low-altitude, fixed-wing attacking aircraft and antitank helicopters, a modern AGDS *must* be capable of effectively engaging and defeating most ground targets, including tanks(!) and heavy armored vehicles (primarily in a *self-defense* mode). More often than not, the AGDS will be accompanied by tanks, so apparently there is no categorical need to provide it with a predominant 'tank kill' capability. Nonetheless, occasionally, while operating on the battlefield's forefront, an AGDS may encounter enemy tanks all by itself. In such a scenario, it needs to have the capability on board to survive.

Furthermore, its inherent antitank capability could be *selectively* exploited to engage vital-point, high-priority targets such as command vehicles (tanks), tank destroyers, and other highly sensitive targets. Indisputably, the AGDS's inherent capability to effectively engage such "hard" and "soft" ground targets as mounted or dismounted infantry, will substantially enhance the close-support and protection provided to the CAT.



The ill-fated DIVAD ("Sergeant York").



Proposed AGDS turret on M1 tank chassis.

A Proposed Solution: The Hybrid AGDS for the CAT

As a viable, cost-effective and practical solution to the above mentioned threats, a hybrid AGDS must be capable of providing adequate defense for tanks and armored formations by creating an effective and close "fire screen." A hybrid AGDS epitomizes the best of both AD worlds — missiles and guns. Though 'surface-to-air' guided missiles demonstrate high kill probability at long ranges (10-12 km), they are expensive to operate and vulnerable to Electronic Warfare (EW) and Electronic Counter Measures (ECM). Consequently, it is essential to include a complementary weapon system, comprised of automatic barreled weapons against low-level aircraft, RPVs, helicopters, and various ground targets operating at short ranges (2.5-3 km). Thus, a modern AGDS must be equipped with a hybrid, completely integrated weapon system, optimized to engage air and ground targets/threats at required ranges under all adverse battlefield conditions.

History: Division Air Defense Gun System (DIVAD)

The U.S. Army recognized the need for a new AD system two decades ago. In January 1978, the DIVAD ("Sergeant York") program was embarked upon by the U.S. Army for the design, development, fabrication, and test of two prototypes. The reasoning for the program was that the Army's forward maneuver forces were recognized to be severely lacking in air-defense coverage. Prototypes were scheduled for delivery to the U.S. Government in mid-

1980 for a comparative test and evaluation.

Development contractors employed existing European cannons and U.S.-made fire control systems and radars. The chassis, as prescribed by the U.S. Army, was a modified, Government Furnished Equipment (GFE), M48A5 tank. The U.S. Army planned to operationally deploy the first DIVAD units in the mid-1980s. Contractors were given ample flexibility to encourage design of a cost-effective system that could successfully achieve operational requirements commensurate with the threats. One prototype had as the main armament twin 40-mm L70 Bofors (Sweden) guns, while the other twin 35-mm KDA Oerlikon (Swiss) guns.

For various reasons, the DIVAD program did not live to see actual deployment. Nevertheless, the operational need did not vanish nor diminish. Conversely, it has steadily and persistently evolved to a degree that constitutes a clear and present threat to the CAT. The authors believe it is high time that the threat definition and present air-ground defense operational capabilities be reassessed, the operational requirements revisited and updated, and subsequently, an AGDS be fielded.

AGDS/M1 Major Operational Capabilities Overview

The proposed AGDS/M1 is an armored, self-propelled, mobile, autonomous, cost-effective, technologically superior, and economically affordable integrated weapon system. It is designed to function as a dual-role, hybrid Air-Ground Defense System for

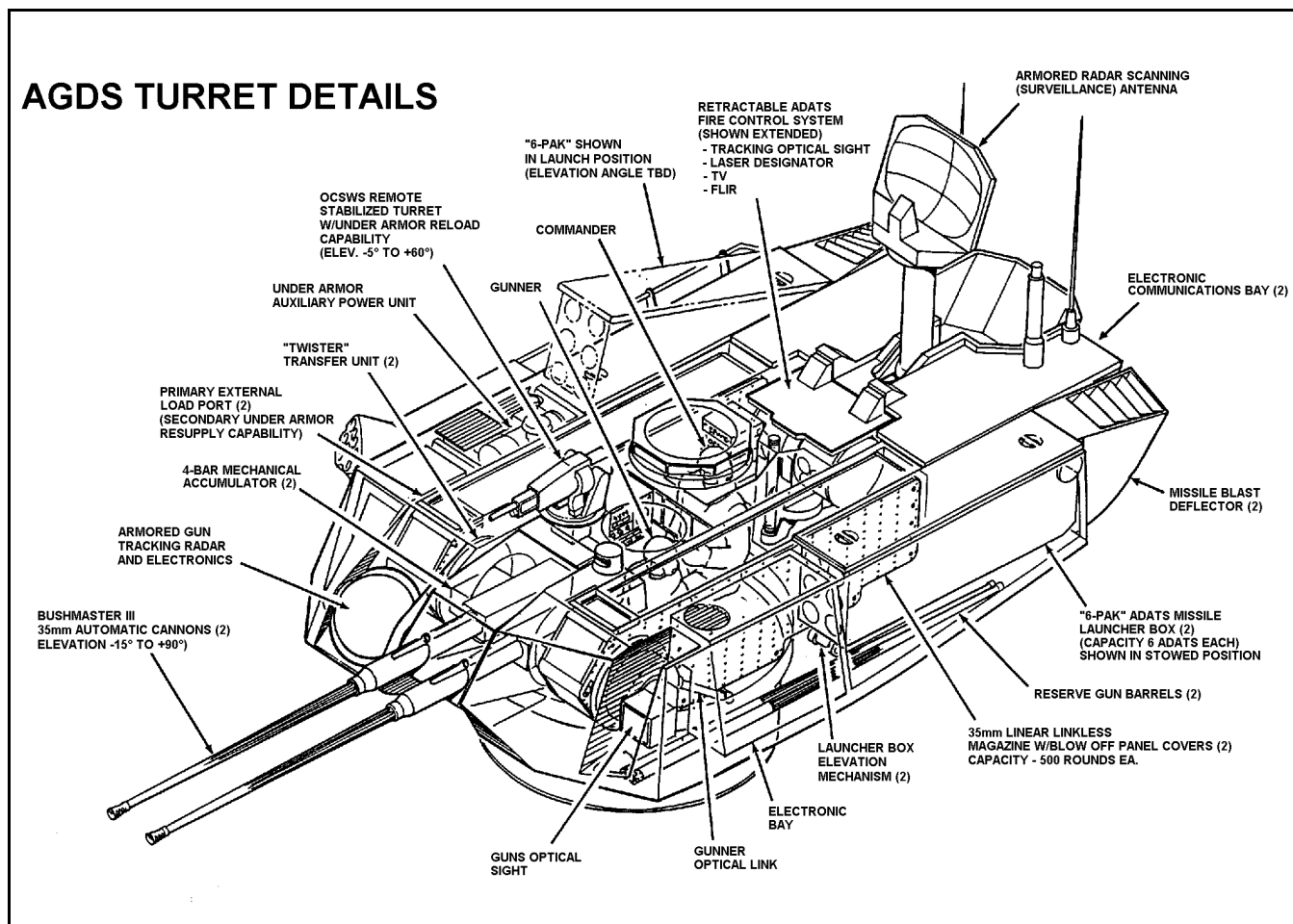
the CAT. The AGDS/M1 is a self-contained "fire unit" employing its own surveillance/tracking radars, fire control systems and main armaments for early detection and destruction of low-flying ground attack aircraft and aerials, antiarmor attack helicopters, and antiarmor ground targets. The AGDS/M1 is based on the battle proven, highly reliable M1 Abrams tank chassis.

The AGDS/M1 concept represents an extremely potent weapon system which, through effective sub-system integration, constitutes a significant leap-ahead in current armored air-ground defense conception and capabilities. It utilizes available proven weapon systems and mature technologies to address a pressing operational need. The following is an overview of its major operational capabilities related to the main armaments:

- **Primary Weapon System Candidate: 'Surface-to-Air' and "Surface-to-Surface" Guided Missile:** Air Defense, Anti-Tank System (ADATS) 'type' missile system is selected as the best overall 'system' choice for a primary weapon because of its inherent advantageous characteristics. ADATS was developed as an international private joint-venture undertaken by Martin Marietta (USA) under contract to Oerlikon-Bührle (Switzerland). ADATS is a single-stage, multipurpose, highly accurate, day/night and adverse weather missile system. It has a true and *unique* dual-target capability for engaging low-flying aircraft, advanced attack antitank helicopters, and armored vehicles.

The proposed AGDS/M1 consists of a passive electro-optical sensor retractable head containing a FLIR, TV, a la-

AGDS TURRET DETAILS



ser rangefinder and a laser beam guidance sensor. Two banks of six missile retractable launchers each (12 missiles in a 'ready-to-fire' mode) are located and integrated at either side of the turret. ADATS was originally designed to permit flexible installation on a variety of wheeled and tracked vehicles and therefore could be modified and adapted to the AGDS/M1 configuration without major difficulty. The additional 'surface-to-surface' antiarmor capability of the ADATS is considered essential, but complementary to its principal anti-air role. It can penetrate the equivalent of 900+ mm (with growth potential) rolled homogeneous armor steel, sufficient to defeat most armored targets (composite/reaction) today and in the foreseeable future. In its various test programs, ADATS has undergone highly successful operating trials in all types of conditions and environments.

AGDS/M1 Individual Mode of Operation: On detection of an aerial target, it is handed off to the passive optical tracking system (high-resolution TV or thermal imaging IR) which is immune to both anti-radiation missiles and ECM. Following passive tracking

of the target in the Line of Sight (LOS), the missile is launched when the target is within range, subsequent and final guidance only being by encoded laser beam radiated from the launching vehicle or an external source. In an antitank 'surface-to-surface' operation, the target is acquired and tracked with FLIR/TV and a laser rangefinder ensures optimal engagement. Launch and guidance of the missile is performed with an encoded laser beam. AGDS/M1 could receive information on targets from a Skyguard fire control station.

The passive guidance system, combined with a smokeless, solid fuel rocket motor propellant, further enhance the system's survivability on the battlefield. The dual-purpose warhead, with fragmentation effects against air targets and shaped-charge against armored vehicles, is detonated by a nose-mounted, impact/crush fuze. An electro-optical proximity fuze is used for aerial targets only. The ADATS missile weapon system will be deployed to intercept air targets at ranges between 3 to 10 km and ground targets between 500 meters and 10 km.

AGDS/ADATS Operating as an Air Defense 'Network': A 'network' of six AGDS/M1, at the division level, can prioritize and engage up to 20 aerial and vital-point ground targets at any given time. The regional AD commander has a complete and expedient picture of the surrounding tactical area with inputs from all subordinate AGDS/M1s. The commander transmits information and targeting assignments to the individual AGDS/M1 over a data link. One or more surveillance radars of the AD network can provide necessary target information to other vehicles, which can then track and engage targets in a 'radar-silent' mode to minimize exposure.

ADATS Missile Major Specifications: Length: 2.08m; Diameter: 152mm; Weight: 51 kg (at launch); Dual-Purpose Heavy Warhead: shaped (hollow) charge and HE fragmentation (12.5 kg); Fuze: electro-optical range-gated laser proximity fuze with variable fuze delay and nose-mounted crush/impact fuze; Propulsion: solid, smokeless, rocket motor; Max. Speed: Mach 3+; Max. Intercept Range: 10 km (slow-air/ground targets), high

speed maneuverable aerial targets: 8 km; Max. altitude: 7 km.

• **Secondary Weapon System Candidate: Air-Ground Defense Automatic Guns:**

Two Bushmaster III 35-mm automatic cannons were selected as the best overall 'system' choice for a secondary weapon because of their inherent advantageous characteristics: American-designed and to be produced in the USA; near end of development; fires NATO standard 35-mm ammunition; demonstrates high reliability, superior durability, exceptional accuracy, and safe operation under all firing conditions. Bushmaster III is virtually an 'upscaled' design and incorporates all the battle-proven features of the Bushmaster 25-mm M242 gun which serves as the primary armament on the Army's Bradley Fighting Vehicle.

Bushmaster III combines design simplicity, external operation, positive round control, ease of maintenance and constant velocity feed to enhance reliability of gun and feed systems. Fired cases are ejected forward (overboard). Longer dwell after firing eliminates gun gas buildup 'under armor.' Bushmaster III capitalizes on the use of externally powered operation to separate mechanism motion from cartridge ballistics. This allows for a precisely timed and fully controllable operating cycle. A key feature assuring outstanding reliability is 100% positive cartridge control from the time the ammunition enters the feeder until the fired case is ejected from the weapon. It is readily adaptable to advanced, high performance, antiair and antiarmor penetrating rounds currently being developed to defeat present and projected future threats.

Utilization of the 'twins' will be limited to targets at ranges not greater than 2.5-3.0 km. To be effective, and yet preserve ammunition, single fire bursts must take no longer than 1.5-2.0 seconds. A very high rate of fire is not necessarily a decisive and mandatory factor at such a short range. Nowadays we have stabilized, highly accurate fire-control systems with enhanced computerized tracking and 'smart' programmed proximity fuses. These render the philosophy of "filling the sky with bullets..." — to increase hit probability — obsolete. The rate of fire is also adequate for engaging relatively slow moving ground targets. Therefore, a rate of fire of 250 rounds per minute,

500 rounds per minute total on target, should be sufficiently effective in hitting and killing air/ground targets within the designated ranges.

Bushmaster III Gun Major Specifications:

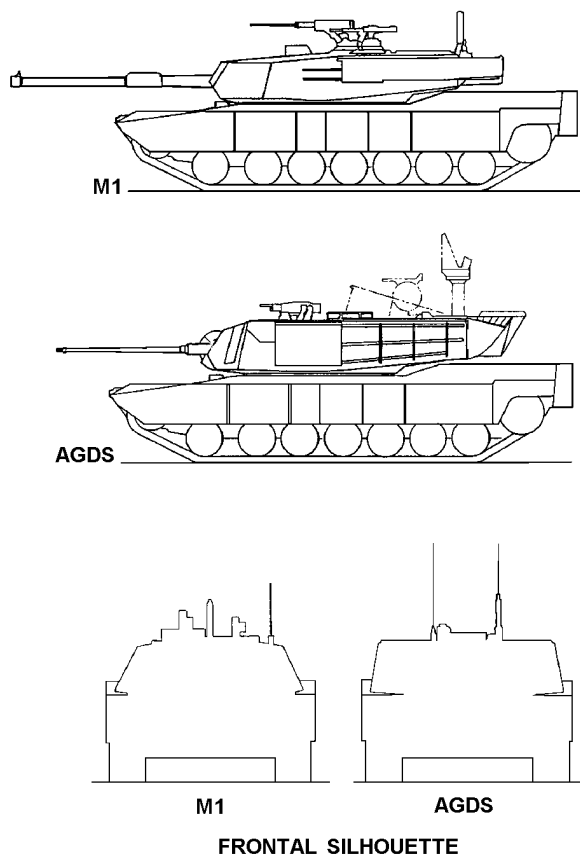
Caliber: 35mm; Muzzle velocity: 4540 fps; Peak recoil: 14,000 lb; Total weight: 535 lb; Overall length: 158.1 inch; Rate of fire: Single shot, 250 spm; Power required: 3.0 hp @ 28 VDC; Clearing method ('cookoff' safe): open-bolt; Safety: Absolute Hangfire Protection; Case ejection: forward (overboard).

Ammunition (NATO Standard 35mm):

Antiair and soft to medium ground armored targets-HEI/T (High Explosive Incendiary, T-tracer); SAPHEI-T (Semi-Armor Piercing +HEI); FAPDS (Frangible Armor Piercing Discarding Sabot). Oerlikon-Contraves has recently developed the AHEAD antiair/missile ammunition to keep abreast of the ever escalating threat scenario.

The essence of the AHEAD concept is the high-precision determination of time and projectile location in space to within 1/1000 of a second and one meter of distance from target. The actual velocity of each projectile leaving the muzzle is measured by muzzle velocity measuring coils and processed instantly by the fire control computer. Time of flight is calculated and imparted through electronic induction via front coil to the projectile's base fuse. When the projectile's timer hits the 'zero' mark, the fuse detonates the payload ejection charge, erecting a 'cone' of 100-200 heavy-metal, spin stabilized sub-projectiles that are directed towards the target with devastating terminal effects. This type of ammunition reduces the need for a high rate of fire to achieve a 'hit and kill' of an aerial target.

M1/AGDS SILHOUETTE COMPARISON



Anti-Armor - FAPDS, APDS-T (Armor Piercing Discarding Sabot), APFSDS-T (Armor Piercing Fin Stabilized Discarding Sabot) to combat armored targets. Evidently, if Bushmaster III is selected, 35-mm NATO standard ammunition must be produced in the U.S. under license. NATO 35-mm standard ammunition, when fired to ranges up to 3 km, is characterized by a short time of flight which ensures flat trajectories with resultant high hit probability.

It has excellent armor-piercing performance by use of discarding sabot shell and excellent final ballistics. Storage, transportation, handling and firing criteria are all in full compliance with the U.S. Army and NATO specifications.

• **Surveillance/Scanning Radar:** A dual beam, X-band, pulse Doppler surveillance radar, 25 km range with enhanced ECM resistance; High-elevation angle search antenna ensures long-range rapid target detection, IFF interrogation, acquisition and tracking with high survivability.

- Primary (ADATS) Fire Control System:** Comprised of Forward Looking Infra-Red (FLIR) and TV trackers, a Nd-YAG laser rangefinder and a laser beam rider using digitally encoded carbon-dioxide laser which provides a guidance beam for the beam-riding ADATS missile. It is fitted with search 'on-the-move' (preferably fire 'on-the-move'), 'track-while-scan' and automatic threat IFF interrogation, acquisition and prioritization for up to 10 targets.

- Secondary (Guns) Fire Control System:** High-powered armored tracking radar transmitter in the J/X-band (preferably 'off-the-shelf') provides enhanced performance against enemy threat and Electronic Warfare (EW) countermeasures; precision angle radar tracking for enhanced direct hit capability; rapid search, track and fire 'on-the-move'; target identification, acquisition and IFF interrogation by radar; Passive tracking FLIR, TV and optical sight; Active tracking by radar.

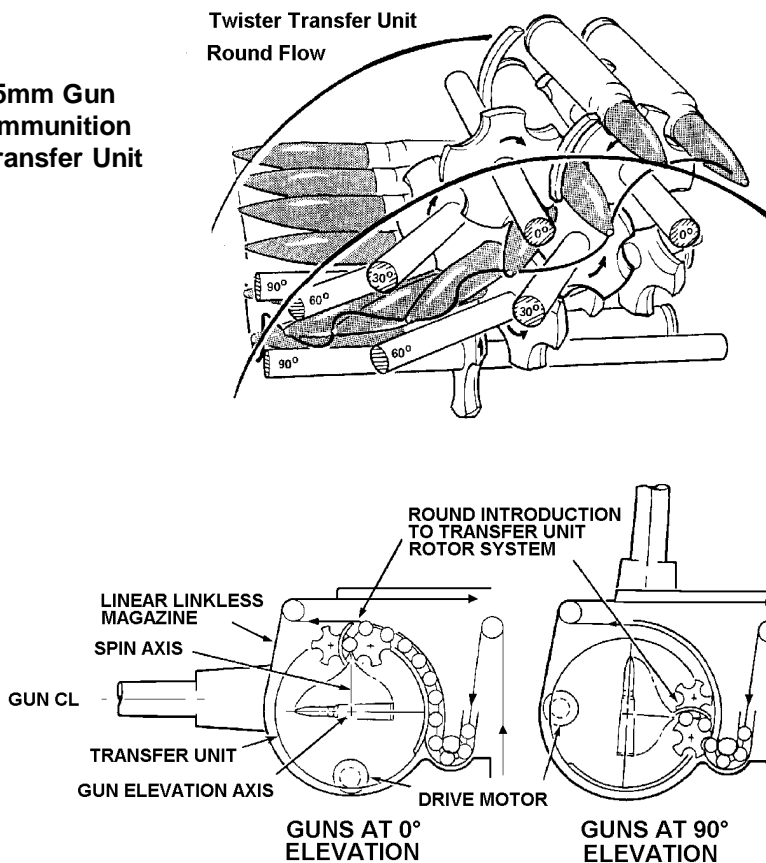
- Gun Optical Sight and Optical Target Designator:** Stabilized, dual-power sight for search, track, identification, and kill assessment while stationary or 'on-the-move'; Computer aided optical tracking against evasive maneuvering targets; Integrated night sight (FLIR) capability; Dual-beamwidth laser rangefinder for accurate air/ground target engagements; open hatch operation would require an optical target designator which provides quick target designation to the tracking radar or the optical sight.

- Command Control and Communications (C3):** C3 net allows the AGDS/M1 to be linked with higher echelon defenses and command centers, other radars and weapon systems for automatic response to saturation and time-compressed coordinated attacks.

- Armored Turret:** The turret's external envelope configuration and level of ballistic protection will resemble an M1 tank but it is not an M1 turret. This will make it more difficult for the enemy to 'single-out' the AGDS/M1 from the M1-series tank fleet as a high priority target. To enhance crew and vehicle survivability, "blow-off" panels will be installed in the magazine compartments.

- Gun Ammunition Handling System (AHS):** The AGDS/M1 utilizes a unique Ammunition Handling System (AHS). This system is comprised of a

35mm Gun Ammunition Transfer Unit



linear-linkless magazine, transfer unit ("Twister") and a 4-bar mechanical accumulator. It is a high-density system that minimizes the required volume such that the AHS approximately fits into an existing M1 tank turret envelope. The unique feed system also permits the elimination of flexible chutes which take up large volume, introduce mechanical complexity and substantially reduce reliability. Linear Linkless (LL) AHS is characterized by 60-70% increase in ready ammunition, enhanced operational effectiveness, lower LCC, less susceptibility to jamming and less chance of round damage.

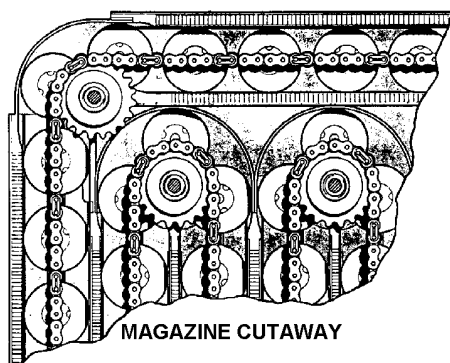
- Dual Feed Capability:** Bushmaster III has a dual feed capability. Anti-air ammunition is stored in the main magazines (2x500 rounds total). Antiarmor ammunition is stored in two additional small magazines (40-50 rounds capacity each), both located above the guns and each elevating with one gun to allow switching and immediate feeding of antiarmor ammunition in emergency situations. This dual feed arrangement reduces cost and volume, keeps the design simple, and maintains the highest possible system reliability.

- Crew:** 3-man crew (commander, gunner and driver) with one man full armament non-intense operation. Commander and gunner can interchange roles.

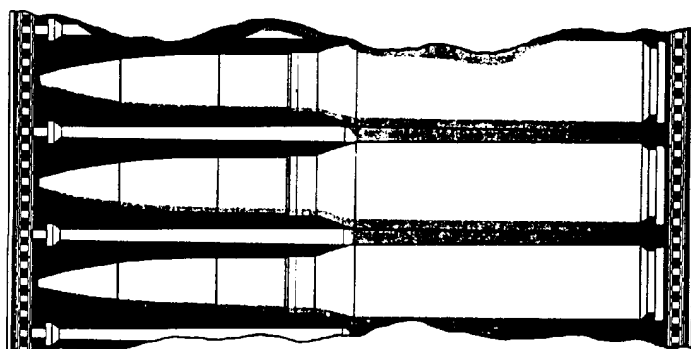
- Crew-Served Weapon System (CSWS):** The CSWS (currently under development) delivers a heavier volume of fire than contemporary crew-served weapons. It is primarily employed to defeat or suppress area-targets such as: personnel under cover and concealment, protected and unprotected personnel, unarmored and lightly armored vehicles, slow flying aircraft and ground emplacements. The CSWS will be installed on a stabilized, remotely operated turret with 'under-armor' loading capability (100-rd. magazine) It will be utilized as a day/night supplementary suppressive weapon system against enemy infantry operating antiarmor weapons.
 Specifications: Weight: 38 lb; Effective Range: 2000 m; Suppression: high at all ranges; Hit probability: high up to 2000 m; Operational Environment: all-weather, 24-hour, against air and ground targets.

- M1-Series Tank Chassis:** The preferred chassis for the AGDS is ostensi-

35mm Linear Linkless Magazine Details



MAGAZINE CUTAWAY



END VIEW

bly the M1-series tank. If the AGDS is to provide close and immediate support to the CAT, it stands to reason that it should equally share the same levels of ballistic protection, mobility, and agility as the forces it is designated to protect. Otherwise, it will not survive, or not be there when its critical support is required. Oftentimes, we tend to make the misconceived decision of selecting a 'degraded' chassis for weapon systems that assume a combat support role. Over the life of the system, it generally proves to be erroneous, both operationally and economically. The M1 tank chassis will require only minor modifications to allow adaptation to the AGDS turret. The AGDS/M1, based on an M1 tank chassis, will benefit from imminent and future fightability and maintainability improvements planned for the M1-series tank fleet.

The M1A2 chassis provides mobility, agility, and maneuverability. It can keep up with armored formations and provide optimum crew ballistic protection with an inherent 20-25% weight

and combat load growth potential. An AGDS/M1, if not heavier than 55-60 tons, will have better mobility and agility than the M1-series tanks it is designated to protect. This unprecedented mobility and agility will permit the AGDS/M1 to exploit its firepower potential to the utmost and provide the necessary 'coverage' when and where it is required.

Concluding Remarks

This article was written to capture the attention and imagination of the reader and trigger a creative and productive thought process within the defense community. The AGDS/M1 concept presented herein, may not be the optimized solution after all. Detailed, quantitative system engineering analyses may indicate alternative choices of guns and missiles. The operational requirement for a dual-role AGDS for the armored forces is more valid today than ever before. The authors believe

that prototypes could be feasibly developed in about 30-36 months and the first systems deployed within 48-60 months if an AGDS/M1 is devised and developed as proposed herein. For this to occur, the U.S. Government must adopt a true "hands-off" approach for procurement in the old spirit of "Prototyping for Production" and vigorously implement the new policy for streamlining the procurement and acquisition processes.

Potential sales of the AGDS/M1 internationally should be another paramount economic consideration in the development process. Foreign sales preserve the industrial base, keep production lines alive, and ultimately reduce the cost of procurement to the Government. An AGDS/M1 is likely to be procured by those foreign countries that operate the M1-series tank and have the logistic infrastructure already in place.

Western Design Howden (WDH), is a small defense company in Irvine, California, which specializes in the design, development, and production of ammunition and material handling systems for the U.S. and International military markets. WDH's track record includes a variety of air, land, and seaborne weapon systems which require automated feed, resupply, and optimized ammunition packaging.

Mr. Lawrence D. Bacon is the Director of Graphic Arts at WDH where, for the past 16 years, he has been responsible for creating numerous concepts for automatic ammunition handling, loading, and storage systems.

Dr. Asher H. Sharoni is the Director of Engineering at WDH. He holds a Sc.D. in Mechanical Engineering from MIT and an M.Sc. and B.Sc. from the Technion, Israel Institute of Technology. Dr. Sharoni is a former colonel in the Israeli Defense Forces in which he was involved in various major armored weapons developments.

How Soviets Fought in U.S. Shermans

By Dmitry Loza (Translated by James F. Gebhardt)

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Translator's Note

*In May, 1993, I came into possession of a manuscript entitled *Stories of the Sherman Tank*. It was written, in Russian, by a Red Army veteran of World War II, Hero of the Soviet Union Dmitry Loza. From November 1943 until the end of the war in August 1945, Loza was assigned to, and then commanded, a Soviet tank battalion equipped with the M4A2 Sherman tank (diesel engines, 76-mm gun). These tanks were sent to the USSR through the Lend-Lease Program. Loza's unit fought in Ukraine, Romania, Hungary, Austria, and Czechoslovakia. At the completion of hostilities in the West, his unit moved to Mongolia by rail, where they were issued a new set of Shermans. They then drove across the Grand Khingan Mountains into Manchuria to fight the Japanese Army.*

In the twenty years that I have followed this topic, Dmitry Loza's first-person account is the most detailed description I have seen of the employment of American military equipment by the Red Army. His story is a collection of anecdotes that speak to the life of a junior Red Army tank officer at the small-unit level. Some are humorous, some will put a lump in the reader's throat.

The Soviets received approximately 1,200 light and 5,000 medium tanks from the USA during World War II. The first tanks shipped to the Soviet Union in 1941-42 were the M3A1 General Lee and the M3A5 General Grant, equipped with gasoline-powered engines. Stalin complained openly to Roosevelt about these early American tanks in his personal correspondence, writing, "...U.S. tanks catch fire very easily when hit from behind or from the side..." The Americans responded by ceasing delivery of gasoline-powered tanks and sending instead the M4A2.

The First Difficult Trials

1943. The largest battle of World War II thundered on at Kursk in July and August. By November, the enemy had been thrown back to the right-bank Ukraine. With each day, the front line inexorably receded westward. Germany and its satellites were forced to go over to the defensive. Occasionally, the enemy made vain attempts to retake the strategic initiative from the hands of the Red Army.

Thus, at the end of November and the beginning of December, the German command launched a powerful attack northward from the area south of Belaya Tserkov (80 km south of Kiev), with the intent to liquidate the Soviet forces' bridgehead on the west bank of the Dnepr River. Although hurriedly occupying defensive positions, our infantry forces were unable to withstand the powerful enemy thrust. The German attack threatened Belaya Tserkov, the capture of which would put them on the near approaches to Kiev, the Ukrainian capital.

Units of 5th Mechanized Corps were in their second month of reconstitution in the forests north and west of Narofominsk [sixty-five kilometers southwest of Moscow]. Seven hours were set aside each day for rest, and the remaining time was spent in study of the equipment, gunnery at a range complex, and tactical field exercises. The following method was employed in our 233d Brigade to accelerate the mastery of the equipment. Permission was given to one crew in each battalion to disassemble almost completely one Sherman tank. The design and function of each instrument, component, system, and the armaments were studied. We had the full opportunity, as they say, to put our hands on a piece of "live" equipment. Ten days were spent in this exercise, after which the tank was reassembled by its crew. The deputy battalion commander for maintenance, together with the chief mechanic, monitored the assembly process, and the battalion armorer inspected the main gun and machine guns. A new group of "students" arrived, and studied the "American" by the same method. De-

tailed posters on the design and function of all the Sherman's systems and armaments had been issued in early October, and a good study guide had been published. Previous training methods were quickly abandoned...

I want immediately to say a good word about the manufacturer of the Shermans. Their representative was continuously available at the headquarters of 5th Mechanized Corps. He scrupulously collected and studied all incident reports pertaining to the "Emcha"¹ during its fielding. I can't recall his last name. It was categorically forbidden to conduct any kind of note taking on the front-line. But I remember we all called him Misha. Even now, at veterans' gatherings, we fondly recall how Misha, having observed a driver-mechanic attempting to twist something in the engine compartment, for example, with a key or a screwdriver, sternly spoke up: "This is factory sealed — tinkering is not permitted!" And the would-be tinkerer immediately lost the urge to turn and tighten screws. The *Emchisti* [*Emcha* tankers] later became convinced that these machines worked like a good chronometer with just normal maintenance resources.

"Hunting With Borzois"

I do not know who first used hunting terms to describe the means developed by *Emchisti* for combating heavy German tanks. It was not for a lark that we had to resort to this tactic in the Korsun-Shevchenkovskiy Operation (January-February 1944).

The tanks of the two sides were far from equal in firepower. The Tiger and Panther were equipped with long-barreled 88-mm and 75-mm cannon. The Shermans also had a long gun, but of lesser caliber — 76.2 mm. The 85- to 100-millimeter frontal and turret armor of the enemy tanks made them practically invulnerable to the *Emcha's* projectiles at those points. However, they did burn, and could be immobilized in place by our precision shooting.

The Korsun-Shevchenkovskiy Operation of two Ukrainian Fronts began on 26 January 1944. The recently created

6th Tank Army, to which the 5th Mechanized Corps belonged, was attacking in the southeastward direction toward Zvenigorodka from the area north of Tynovka. 5th Guards Tank Army of the adjacent First Ukrainian Front was attacking from the opposite direction to converge with it. In coordination with infantry formations, these tank armies were to encircle significant enemy forces in the Korsun-Shevchenkivskiy bulge.

Beginning on the morning of 27 January, 233d Tank Brigade — the backbone of the corps forward detachment — received the mission not to become engaged in protracted battles for isolated enemy strongpoints, but to penetrate into Zvenigorodka, where it was to close the ring of encirclement.

At midday, the brigade's 1st Tank Battalion, with *tankodesantniki*² aboard, reached the outskirts of a large and important — in the operational-tactical sense — inhabited area, Lysyanka [135 kilometers south of Kiev]. The enemy, realizing the key significance of this strongpoint, had concentrated up to a battalion of infantry, reinforced by five Tiger tanks, to hold it.

Lysyanka — a small regional town — stretched out in a deep hollow. Its houses could be seen only from a close vantage point. The Germans had dug in on the heights that framed this inhabited locale. They were covering the road and heights adjoining it with dense interlocking fires from all weapons. The defenders paid almost no attention to the gullies and ravines. They believed that their bottoms and side slopes, deteriorated from the bad weather, were unsuitable for deploying tanks.

We had to seize Lysyanka as rapidly as possible. The most important targets in its defenses were the tanks. They had to be knocked out in the first assault. It would then be much easier to deal with the infantry. The accomplishment of this task was further complicated by the worsening weather—the rain was growing heavier. Captain Nikolay Maslyukov, the battalion commander, made the following decision: two tank platoons were to attack the enemy along the highway (demonstration group), and the platoon of Junior Lieutenant Mikhail Prikhod'ko, moving along the side of one of the broad gullies, was to reach the flank of the Tigers and attack them with armor-piercing rounds on their hulls. This concept followed the model of "hunting with

Borzois" — the dogs tantalize the wolf from the front, while several hounds come at him from the flanks to take him down.

Our tanks maintained radio silence to achieve surprise in this unusual attack. Only the radios of the battalion commander and the two platoons attacking along the road were left on. Nikolay Maslyukov quietly orchestrated the actions of the demonstration and flanking groups.

Attentively studying the surrounding terrain, Prikhod'ko noticed nothing except dripping wet shrubbery and the occasional modest tree. The *Emchas* of his platoon crept forward on idling motors, avoiding movement along the same track. There was the possibility of getting bogged down in the soggy chernozem.³ As before, visibility was poor. A meeting wind hurled large raindrops into their faces, and carried the noise of their laboring engines from their sterns into the endless steppe. This encouraged the tankers, because it provided additional security to their actions. It would have been worse for the wind to be blowing toward the enemy. "Today, the weather is our friend," the platoon commander said encouragingly to his crew.

Hundreds of meters of a difficult path lay behind. Prikhod'ko understood that his tanks could encounter the enemy at any moment, and he was not wrong. Up ahead, Mikhail noticed a mound — a small ground sheet hung suspended above the ground. It was motionless. Out from under the tarpaulin crawled a German soldier, who stared at the lead tank, clearly not knowing if it was his or ours. Without hesitation, the driver-mechanic veered his Sherman toward the enemy position and ground the soldier and his covered machine gun into the earth. The enemy's security outpost had been destroyed without a sound. This did not happen often. "The defender's main forces are somewhere nearby," the platoon commander concluded to himself. A sheet of heavy rain hid the horizon from view. The enemy position was somewhere up ahead, but it could not be discerned.

Prikhod'ko reported his engagement with the enemy outpost to the battalion commander, and received the order to stop. The demonstration group along the road began its spirited "teasing" attack, trying to attract the defenders' attention completely to itself. By doing this, it simplified for Prikhod'ko's crews the accomplishment of their mis-

sion. The Shermans of the flanking group froze in place, their motors quietly idling. The commands of the officers of the tanks attacking frontally sounded crisply in the headphones. Frequent machine gun bursts and the noise of motors were reported. The main part of the concept of "hunting with Borzois" had been accomplished successfully. At this time, somewhere in the heights a strong gust of wind dispersed the heavy curtain of clouds, and a broad patch of sky shone through. The rain halted. Would it hold off long? A moment! A fortuitous moment! Prikhod'ko fixed his glance at the unfolding view. Some seventy meters ahead loomed two immense black-crossed tanks. Their main guns "patrolled" the road, prepared at any moment to greet our tanks attacking from the front with deadly fire.

Two Shermans of Prikhod'ko's platoon, moving in echelon, had stopped at the same time. This enabled them to open fire quickly, without interfering with each other. Their main guns had long ago been loaded with armor-piercing rounds. "The right Tiger is yours, the left one is mine. Fire!" commanded Mikhail.

Main gun fires ripped through the damp cold air. The engine compartment of the right "beast" was enveloped in flames. The left Tiger shook from the strike of the solid shot, but did not catch fire. Prikhod'ko shouted to the gunner, "Finish him off!" The second armor-piercing round did its work — the clumsy target belched black smoke. The German tankers began to jump out of their vehicle. Accurate machine gun fires found their mark.

The *Emchas* attacked forcefully along the road, conducting intensive main gun and machine gun fires. Prikhod'ko's platoon also did not spare their ammunition. Having been attacked from two sides, the enemy began to withdraw under fire to the south. Minutes later, the lead tanks of Maslyukov's battalion, in coordination with their *desantniki*, burst upon the enemy positions. Lysyanka stretched out below.

The *Emchisti* participating in the defeat of enemy attempts to break out of the Korsun-Shevchenkivskiy ring" employed a different method of combat with the enemy's heavy tanks. Two Shermans were designated in each platoon for each single attacking Tiger. One tank fired armor-piercing shells at

one or the other track, the other tank awaited the moment when the undamaged track had driven the German tank into a 90-degree turn, exposing its entire flank. Then it delivered a solid shot into the fuel cell. As a rule, attacking enemy tanks were permitted to close to 400 to 500 meters. It was difficult to break a track at greater ranges.

A "Psychological" Attack

Each officer at the front had his own moment in the sun, a specific day (or days) and a defined place. For Captain Nikolay Maslyukov, this was Lysyanka. This, indeed, was the peak of his command talent. Without a doubt, new aspects of the gifted battalion commander clearly would shine forth in other battles. But the time of his death was near. Maslyukov perished at 1300 on 28 January 1944 in Zvenigorodka. We were doggedly fighting our way there.

The wildly fluctuating weather continued. The brief pause was sufficient only for the capture of the important heights on the approaches to Lysyanka. Even more heavy rain fell later and, with the coming of dawn, abundant wet snow. Like it or not, this enemy strong-point had to be taken at night.

Nikolay Maslyukov assembled the company and tank commanders and explained the developing situation. At this time the crews replenished their *Emchas'* ammunition supply. A stubborn fight in a built-up area lay ahead, at night. Nikolay Nikolaevich listened to the opinions of his company commanders and several platoon commanders. All arrived at the same conclusion: Attack Lysyanka without delay, bringing all the firepower of their Shermans to bear on the enemy, and, as before, not sparing main gun rounds or machine gun bullets.

The captain agreed with his subordinates' opinion. He himself added: "We will augment the strength of our fire attack by turning on our lights and blowing our sirens at full power. We will conduct a 'psychological' attack!"

The *Emchas* had modest headlights, with a sufficiently powerful beam, and a "wailing" signaling device — a siren. When it was turned on, even the tankers, who knew its voice, experienced tingling in their spines. How would it affect someone who was hearing it for the first time? And at full power? Could he keep his nerve?

Then came Captain Maslyukov's terse command: "Turn on lights and sirens! Forward!" Though years have passed, the picture of this unusual attack is clear in my mind in all its detail. The piercing light of the headlamps pulled the road out of the darkness, along with the adjacent fields, houses, and trees. It blinded the enemy infantry and artillery gun crew. The powerful howl of the sirens ripped into the night. It assaulted the eardrums and placed a heavy load on the brain. The enemy fire, initially somewhat dense, began to weaken. The "psychological" attack bore fruit. "Any means is good in battle: blind the enemy, destroy him with the tank!"

From the first moment of the attack, the Sherman crews conducted intense main gun and machine gun fires. When the enemy's resistance had noticeably weakened, Maslyukov sternly ordered: "Conserve ammunition! Use your tracks!"

Each platoon and tank commander, emerging partially from his hatch, could easily see the enemy in the illuminated surroundings. Using their intercom systems, they gave commands to the driver-mechanic, directing their *Emchas* toward observed targets. Assault troops carrying submachine guns ran nearby, shielding "their" Sherman from panzerfaust gunners. The armor plate of antitank guns cracked. The multi-ton mass of the "American" easily overran the defenders' mortars and machine guns. The soft wet earth received the debris into its cold embrace without resistance. Maslyukov's battalion and the submachinegunners of the brigade commander's reserve captured Lysyanka without losses.

Early April, 1945. Formations of 6th Guards Army had seized the cities Shopron and Sombatkhey in northwest Hungary. Vienna was about sixty kilometers away. We had to interfere with the Germans' efforts to mine and destroy historical monuments and bridges, to move industrial equipment and cultural treasures out of Austria's capital. The army commander, Colonel-General A. G. Kravchenko, made the decision to send a detachment to Vienna. This detachment consisted of 1st Tank Battalion, 46th Guards Tank Brigade (eighteen Shermans), three SAU-152-mm guns, and a company of airborne troops — eighty men from the 1st Airborne Battalion of the 304th Airborne Regiment, commanded by



Guards Lieutenant Nikolay Georgievich Petukhov. The detachment was ordered to function as a raiding detachment in the enemy's rear area, hurriedly reach Vienna, penetrate into the city center from the south, and seize key objectives: the parliament building, art history museum, opera house, Belvedere Palace, and Academy of Sciences. We were to hold the captured buildings and surrounding blocks until the arrival of the main body of 9th Guards Mechanized Corps. The crews were briefed that they would be operating in the enemy's backyard for twenty-four hours, possibly even longer.

The army commander cleverly included in the detachment the high maneuverability and firepower of tanks and self-propelled guns with the practiced ability of airborne troops to fight fierce and prolonged battles in the enemy's rear. It was ever so strictly ordered: "Except in the most extreme case, do not become engaged in combat on the way to the Austrian capital!"

As the detachment commander, I shared a single thought and emotion with each tanker — get to Vienna quickly. Two circumstances dictated such operations. First, the objectives designated for capture were located a significant distance from the front line. Their defense might still not be well organized. Second, the Germans were unlikely to conceive of the idea that the Russian command would take this unbelievably risky step — inserting tanks and infantry into such a large metropolitan area.

The southeastern sector of Vienna had several less dense built-up areas near the Danube canal. However, honestly speaking, we did not have full confidence that the approach of Russian tanks to the city was not known here also. That is, on the new axis (if we went that way), we might not be able to achieve the necessary movement security. One thing was sure. If we continued on our present course, we would suffer more losses. We studied the layout of the southwestern sector of the Austrian capital. We were looking for a route through Meydling to the city center. There were substantial obstacles — hilly terrain covered by a forest, and a winding road. The enemy would not

need substantial forces to delay us. We decided upon a variant — bypass Vienna from the southwest and break into the city in the sector of the Hutteldorf-Linz highway. Austria's main highways were in excellent condition. The fires of war had not yet touched them. They were lined with tall, leafy trees. Their inter-arching green borders camouflaged the detachment well from the most dangerous threat in this situation — enemy aviation.

Darkness was approaching when the battalion reached the bridge west of Hutteldorf. Barricades blocked the streets and approaches to the bridge. Antitank fire struck the tank of Guards Senior Lieutenant Grigoriy Danil'chenko, commander of 1st Tank Company. We were forced to withdraw a bit. We maneuvered to the right and reached Hacking. Our mission was growing more difficult as time passed! Here a solid fortress wall of some length blocked our path. We could not go around it. Time was slipping away. We had to ram it with a tank. Guards Sergeant Nikolay Oseledkin, a driver-mechanic, executed this task masterfully. First he made a small breach. With several strikes of the tank's bow, he enlarged the breach until a Sherman could drive through it. The guards tankers christened this breach the "triumphal arch." Tanks with paratroopers clinging to them hurried along the railroad embankment toward the western station. The city was going about its normal daily life — buses were plying the streets, trolley cars were clanging, and the Viennese people were scurrying about with their business. Traffic policemen signaled our column forward without delay at three intersections. But this atmosphere did not last long. Soon the situation changed radically. They recognized us. One after the other, the canal bridges on our battalion's route of march went up in smoke. There were a lot of them.

Each *Emcha* commander had a map of the city. This permitted the detachment to continue closing on our designated objectives along multiple routes.

At 2300 on 9 April, I reported to the brigade commander by radio: "We have reached the center of Vienna!" And so, the first part of our combat mission was accomplished. The second — no less difficult — was to hold the captured area until the arrival of our own forces.

The principal concern of a commander in such situations is the organi-

zation in the briefest time of a defense and, in particular, its most important element — a system of fire. The tankers and paratroopers were arrayed so that each street, intersection, and passageway was under our constant observation. If an enemy appeared, he was destroyed by concentrated fires of all systems. The SAU-152s comprised our reserve, for reinforcing the threatened axis or sector in the course of the battle.

On my order, Guards Lieutenant Nikolay Petukhov's paratroopers carefully began clearing the blocks adjoining the area occupied by our force. Their task was to clean out enemy soldiers. The fact that the electricity remained functioning in central Vienna until 0200 initially facilitated the accomplishment of this mission. As soon as the enemy realized the situation, he turned out the lights.

The night was uneasy. Knowing the city well, the Germans made several reconnaissance forays. They threw grenades at our tanks from the roofs and upper floors of houses. We had to park our Shermans under the archways of buildings. The paratroopers quickly liquidated this danger from above. The crews did not sleep. All were at their battle stations, prepared to defeat an enemy attack. Only near morning did the driver-mechanics and gun commanders manage to snatch a bit of rest. No one doubted that at dawn the enemy would launch his attack. And we were not mistaken. The enemy made his first strong attack in the morning.

Not long before this, the Germans had begun to fire with an antitank gun at an *Emcha* parked under an arch. During the night, they had dragged it to the upper floor of one of the houses north of Ratush'. The enemy managed to damage the track on two tanks. We quickly had to take appropriate measures to prevent the majority of our vehicles east of Ratush', the University, and Parliament from being damaged. We wanted to leave them in those positions, because from there they could better engage an attacking enemy.

I called the commander of the SAU-152 battery, and ordered him immediately to suppress the enemy firing point. The self-propelled gun, sliding along the asphalt on its broad tracks, took a position on one of the streets on the southeastern side of the square. All of us were curious. We wanted to watch the self-propelled gun blow the German gunners and their cannon to

pieces. The tankers and paratroopers poured out into the street and began to wait. Now, recalling those minutes, I cannot excuse myself. As an inexperienced commander, I committed a serious error. At the time, I permitted these "spectators" to line the street. We paid a high price.

The Viennese lanes that ran in various directions from the central square were not wide. Beautiful houses with venetian blinds on their windows rose up on both sides of these lanes. Each soldier and officer would learn to his misfortune that these windows would end up on the street.

The shot of the self-propelled gun's large-caliber cannon roared forth. The air itself shook. One and one-half floors of the house, together with the enemy antitank gun and its crew, crashed to the ground. And in our own position? With a crash, the powerful shock wave of the shot broke the thin window glass in the houses near the self-propelled gun. Heavy shards of glass poured down on the heads of our "spectators." The result was lamentable: scores of wounded arms and backs, and two broken collar bones. Thankfully, the tankers were wearing their headgear, and the paratroopers their helmets. Their heads remained intact. What now! We were fighting our tanks inside a large city for the first time. Bad experience is experience, just the same!

There was no time to moan or complain. Enemy tanks were already moving along several streets toward the University and the Parliament. Infantry were attacking behind them, using the tanks for cover. The enemy was beginning an attack on a broad front. Very well, then, the hour had come to "cross swords" — armor with armor, fire with fire! We had the advantage. The battalion was deployed in combat formation. The Sherman fired more accurately from a stationary position.

A Panther, the thick armor of its turret and hull forming a shield, was leading the attackers on every street. The long range cannons of the heavy tanks that stopped outside the direct fire range of our Shermans' 76-mm main guns enabled them to strike our combat vehicles from a significant distance. In this unfavorable situation, the *Emcha* crews, on general command, employed a minor, but important, deception. They backed their tanks deeper into the archways. They remained ready to reoc-

cupy their position, on command, and spray the enemy with machinegun fire.

Battles are decided in seconds. The driver-mechanic of Guards Junior Lieutenant Bessol'tsev's tank tarried a bit too long, and was unable to reposition his vehicle immediately. This small lapse turned out to be fatal. The *Emcha* was hit. The commander and assistant driver-mechanic were wounded, but the main gun was undamaged. The crew bandaged themselves, and remained at their stations on order of the junior lieutenant. The immobile Sherman was prepared for an unequal duel, with an antitank round loaded in the main gun. The radio operator prepared a smoke pot; its dark gray screen at the right moment would effectively conceal the tank position. The rapid disappearance of our tanks, it seems, somewhat discouraged the enemy crews. The Panthers stopped. They hesitated, then slowly moved forward. One of the Panthers turned toward Bessol'tsev's tank, in all probability intending quickly to close the range in order to fire the killing shot. The junior lieutenant understood the enemy tank commander's intention. He ordered the radio operator to throw the smoke pot forward.

The thick cloud of smoke began to obscure the archway and the street in front of it. Now let the enemy try to find the target.

At this time, assistance sent by the company commander, Guards Senior Lieutenant Ionov, came to Bessol'tsev by the rear courtyards. Knocking down the intervening fence, the Sherman of Lieutenant Abib Bakuridze approached Bessol'tsev's tank from the rear, quickly hooked a tow cable onto it, and towed it to a safe place.

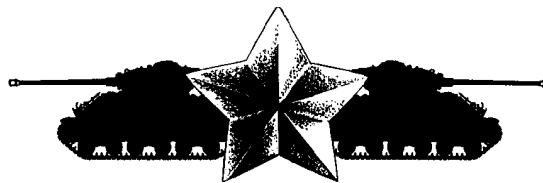
The Panthers did finally reach the line where they could be destroyed by the fires of the *Emchas'* 76.2-mm guns. The command went out over the radio: "Take your positions! Ten seconds later, the archways of the houses on the eastern edge of the central square were bristling with the Shermans' long barrels. A cannon duel commenced at close range.

Combat in cities is a great number of violent isolated engagements, in which success depends on the quickness of actions, the coolness of commanders of all ranks, the mastery of each crew member, and the skill of the infantry support troops. Guards Lieutenant Konstantin Drozdovskiy's tank was in a very good position. The archway en-

trance into the courtyard was ten meters from the corner of the building. Adjoining the house was a small square. Earlier, Konstantin had prepared a good route for maneuver out from under the archway into the square and back. And not in vain.

Up to one and one-half platoons of enemy submachinegunners were advancing on Drozdovskiy's position. Behind them were two Panthers. The forces were unequal. But the Guards *Emchisti* did not flinch. They skillfully engaged in a one-on-one fire fight. The lieutenant ordered the full weight of his main gun to rain upon the infantry, who represented a great danger to the tank. And then immediately to change positions. Volley fire with high-explosive rounds cut through the enemy submachinegunners very well. Those who survived immediately turned back and took cover behind the tank and in a house. The sector of observation and fire was better from the new position. Konstantin saw two armored vehicles approaching the square. They were almost in one line, in places shielding their vehicles behind house walls. There was deep thought shown in this combat formation. The Germans correctly figured that our tank could simultaneously knock out both targets with a single shot. An intact Panther managed to detect and hit an *Emcha* before the Sherman's crew was able to reload their main gun. In this single method, the enemy tank commanders demonstrated that they were not novices on the battlefield. Drozdovskiy accepted the enemy's challenge, and turned out to be more clever than the Germans. The first antitank round struck the right flank Panther on its left track. The intact right track drove this tank to the left, pressing the adjacent tank into a wall. Both enemy tanks froze in place. At the same instant, a smokepot flew from the turret of Drozdovskiy's tank. The thick cloud of smoke filled the square and street, depriving the Germans of any possibility of conducting aimed fire. Konstantin again changed his position. When the whitish shroud of smoke dissipated somewhat, the guards spotted a backward-moving Panther. A precision-fired antitank round forced it to stop in the middle of the street.

My command observation post was in the opera house. My reserve, the SAU-152 battery, was nearby. Radio reports were coming in from the company



commanders. I was monitoring the conversations of platoon leaders with their subordinates, describing the axis of the enemy's main attack from a position north of Ratush' and the University to Belvedere Palace. The enemy's intentions were manifestly obvious: to divide our detachment's combat formation into two parts, press the larger (eastern) portion toward the Danube canal, and destroy it.

As a result of an almost forty-minute fight, the attacking tanks and infantry were halted at the approaches to the central square, three Panthers were destroyed, and we lost two Shermans. Not less than fifty enemy submachinegunners were killed or wounded. Our method of combating tanks — "hunting with Borzois" — that we had tested in past battles, was not used in beating off the Germans' attack. Although I reminded everyone about it before the battle, I did not require its employment during our first encounter with the enemy. Drozdovskiy made one unsuccessful attempt, from out of a narrow alley. Not one Panther presented its flank to him, therefore he did not engage them. The damaged track of a heavy tank can be repaired in a short time. Meanwhile, this "armored pill-box" is capable of conducting powerful fire with its long-range gun. The enemy, gathering up his forces, could once again launch his attack with the support of the immobilized Panther.

I had to turn the developing situation in our favor. And the quicker, the better for our subsequent presence in Vienna. Our self-propelled guns were an effective means at my disposal. I discussed a plan of action with Senior Lieutenant Yakov Petrukhin, the battery commander of the big SAUs. We agreed on the following: The self-propelled guns, employing the long range and firepower of their 152-mm guns, would strike first at the mobile Panthers. Their second priority was to fire on vehicles that had already been hit. This method would minimize the expenditure of ammunition. We faced many hours of combat before the arrival of our own troops. The battery commander would pay special attention to the concealment of the movement of his self-propelled guns into firing positions. The Sherman crews would try at this time to distract the attention of the enemy

tankers, conducting fire in order to blind them.

Yakov Petrukhin reported that he had selected two very suitable firing positions: they had good cover in front to defend the hull of his vehicles from enemy armor-piercing shells.

The firing intensity increased from our side along the entire eastern line. The *Emchisti* were attempting to solve two problems at once: to prevent the Germans from spilling out onto the central square by blocking them up in the surrounding streets, and to cover the movement of the self-propelled guns to firing positions.

How slowly time passes when one awaits the decisive moments in a fight with the enemy. There was no doubt — the turning point was near. The long-awaited time had arrived. Two thundering shots assaulted our eardrums, blowing the glass out of the windows of nearby houses, and rattling other windows some distance away. “Pardon us, beautiful city, that we cause you to tremble, and at times, we destroy parts of you! The laws of war are ruthless!” I wanted to cry out loudly, seeing the destruction we were causing.

The “second Viennese spectacle” turned out to be no less impressive. The strike of a large-caliber projectile (Yakov had ordered a concrete-breaking round loaded, for greater effect) knocked the turret off one of the Panthers that had already almost crawled into the square. The second heavy tank blazed up in an enormous fire. The SAU-152 immediately abandoned its position. It was as if they had poured boiling water on the enemy. The awkward armored vehicles hurriedly began to withdraw rearward. The enemy infantry, now lacking tank support, ran away through courtyards and alleys. And so, the enemy’s first attempt to divide the raiding detachment suffered defeat. The Shermans and paratroopers stubbornly held the center of Vienna. I reported the battalion’s situation to the brigade commander. He informed me that corps units were conducting a successful attack on the southern approaches to the Austrian capital.

Dinner in Vienna

The detachment’s personnel had not eaten hot food in more than a day. They were eating dry rations. If my memory serves me correctly, in the

center of Vienna was a restaurant that went by the name “Astoria.” I decided to order dinner for 180 people at this establishment. I delegated the battalion chief of staff, Guards Senior Lieutenant Nikolay Bogdanov (who spoke German fluently) to reach an agreement with the restaurant owner. The desired meal time was 1200 (Moscow time). We had foreign currency — dollars, pounds sterling, and shillings — to pay for the dinner. There was no doubt that the enemy’s morning attempt to attack our positions would not be his last. Taking advantage of the coming lull, I headed for the area of the art history museum with a group of officers. It was possible that the Germans would again throw themselves at us from the Ottakring or Funfhaus sectors. We had to inspect the organization of the defenses on the approach to the museum, and make some adjustments to the system of fire based on the experience of the enemy attack we had just defeated. I repositioned the SAU-152 battery to an area south of the Parliament.

After conducting the necessary work with the units, I decided to take a quick glance at the museum, to see its displays. We entered the building, and were stunned. The halls were completely empty of paintings or sculptures. The walls showed only various sized dark rectangular and oval patches, signs that canvasses hung here at one time. During the war years, each of us had seen the fascists’ crimes more than once. And here was their latest crime: the theft of the artworks and historical artifacts of the state property of Austria.

Passing through the labyrinth of large and small halls, we found ourselves in a cellar area. Immense joy flooded over us: here were stacked hundreds of latticed, reinforced crates. As it became clear, these crates contained the museum’s displays — paintings, sculptures, and so on. It was obvious to everyone that the Germans were preparing to ship them. The hurried entrance of our raiding detachment into Vienna had disrupted the enemy’s plans. These priceless treasures had not disappeared!

I returned to my command observation post in the left wing of the Parliament. Nikolay Bogdanov and the restaurant owner were waiting there. The Austrian wanted to confirm one important detail of the upcoming meal. What kind of alcoholic beverages should be served? I thought about it for several seconds. This was not a minor issue.



So I decided to allow the *Emchisti* and the paratroopers to drink a limited amount. They had earned it. “And what does the proprietor of the Astoria have?” I asked Bogdanov. “Cognac.” I calculated that the troops had gone more than a day without sleep or rest. How strong a “potion” would not harm our mission? “And what else does he have, besides cognac?” “French champagne!” The restaurateur raised the thumb of his right hand and pronounced, “Gut!”

Who would have believed it! Where, and when, would we dirty-covered tankers get a chance to drink such “nectar”! I ordered champagne for the tables, one bottle for every two men. “Does the manager have an adequate supply?” I turned to Bogdanov.

The Austrian made a mental calculation and replied affirmatively, “Ninety



bottles is nothing!” We agreed on this quantity.

Thirty minutes before the appointed meal hour, the restaurant owner invited the battalion command to the covered tables. The table appointments were beyond criticism: snow-white table linens, nickel-plated utensils, and beautiful porcelain ware. In sum, everything was high class. Without a word from us, the owner and the chef walked around all the tables and sampled each prepared dish. This in itself guaranteed the quality of the meal.

The command went out to all the units: leave half the crews and paratroopers in the positions, and the remainder come to the Astoria for dinner! Thirty minutes was allocated for the meal, followed by a changeover of the personnel. Departure from and return to the positions were to be conducted with

the strictest observation of security measures.

The tankers, artillerymen, and paratroopers liked dinner. Yes! This was their first such feast along their wartime roads (for some, thousands of kilometers). No doubt, they would remember it for the rest of their lives.

My deputies, chiefs of services, and I (seven persons altogether) began to discuss how much money to pay for this fare, and with what currency. I will openly admit that we all were total novices in these matters. We made a “Solomonic” decision, to let the restaurateur himself present us with a bill for the meal and specify the currency of payment.

The battalion chief of finance services placed three stacks of currency on the table: dollars, pounds sterling, and Austrian shillings. We called over the

owner of the Astoria. Nikolay Bogdanov explained what was required of him. He hesitated a bit with his answer, and then expressed a preference for “greenbacks.” He named a sum. I took the stack of dollars, the bank seal still affixed, and, saying “Bitte!” handed it to the Austrian.

With a slight tilt of his head, he accepted the money and immediately secreted it in the inside pocket of his jacket. After several seconds, he pulled the money out of that location and hurriedly thrust it into his pants pocket, not releasing it from his hand. With some trepidation in his eyes, he threw a hurried glance in our direction. The pupils of his eyes (I wasn’t the only one who noticed) were greatly enlarged. What was bothering him? Unfortunately, we never found out. My tank commander, Guards Lieutenant Ivan Filin, came running in and exclaimed,

"The Germans are attacking again!" We flew out from behind the table like the wind. Everyone hurried to his combat post.

We defeated this German attack, from the Funfhaus area in the direction of the art history museum and the opera house, easily and quickly. Having lost one tank and perhaps thirty soldiers and officers, the enemy withdrew to his starting positions. We had six wounded and two killed.

By the evening of 10 April, attacking units of 9th Guards Mechanized Corps broke through toward the center of Vienna through Meydling. The Shermans filled the streets and lanes of the Austrian capital. Our raiding detachment had accomplished its difficult combat mission! The battalion had fought in the enemy's rear, separated from the brigade and corps main bodies for twenty-four hours. The enemy had lost four tanks, two antitank guns, and approximately 100 soldiers and officers. Our ranks were also depleted: four *Emchas* were destroyed, ten men were killed, and fifteen were wounded. In these most difficult conditions, the detachment's soldiers and commanders displayed exceptional endurance, courage, and determination. They had mastered their experience of combat in a large city.

All the enlisted personnel of 1st Tank Battalion, 46th Guards Brigade, the paratroopers, and the artillerymen were recommended for decorations. Later, I was awarded the esteemed rank of Hero of the Soviet Union.

On 13 April 1945, after stubborn street battles, our forces took full control of the city. Vienna. Many of our troops were awarded the medal "For the Capture of Vienna."

The first anniversary of Victory Day was being celebrated in our unit on 9 May 1946. At a ceremonial dinner on the occasion of this holiday, one of the officers said, "Hey, this is not even half the dinner we had in Vienna!" Those commanders who understood what he was talking about began to laugh. "What did you expect?"

I immediately questioned the chief of finance, "How much did we pay the owner of the Astoria for our meal?"

"Comrade commander, do you remember the denomination of the bills in that packet of money?" "I think they were \$100 bills." "Yes. And there were

fifty of them." "Damn!" "We paid that hospitable Viennese \$5,000 for that dinner."

That's what we thought at the time. Sometime not too long ago, I had a conversation with one of our Russian embassy officials. I told him about those long-ago April days of 1945. And about the dinner in Vienna, and our settlement with the restaurateur. He corrected me. "There were not 50, but 100 \$100 bills in that packet. This was the traditional bank packet!" This is why the Austrian's eyes got so big. It turns out that we, simple Russian soldiers, paid him generously! Probably no one had ever settled their bill so lavishly in this restaurant. So much so, that it left him speechless.

East to Mongolia

The formations of 6th Guards Tank Army completed their rail journey from Czechoslovakia to Mongolia at the end of June 1945. 9th Guards Mechanized Corps detained at Choybolsan station. Its 46th Tank Brigade was concentrated fifteen kilometers northeast of the city. The army's forces had arrived in the Far East without combat vehicles or transport. They were to receive this equipment in their new operational area. Units were at full strength in tank crews, gun and mortar crews, and truck drivers. The headquarters of all troop formations were fully manned with enlisted personnel and had a sufficient number of buses. This permitted them to be included immediately in the enormous effort to prepare the forces for the upcoming combat activities.

The Mongolian steppe was as flat as a table top, all the way to the horizon. Abundant rains had recently fallen. The sun's rays had not yet burned the tall green grasses. Everywhere one looked were large herds of sheep. Cattle herders migrated here from the southeastern regions of the country.

For us "westerners," everything was a marvel: unbearably hot days and somewhat cool nights. We became acquainted with the charms of the sharply continental climate during our first days in Mongolia. Added to this was the absence of roads and clearly visible landmarks.

The brigade's units were prepared for battle from the moment they received their equipment. The Shermans were fully manned by crews battle-tested in the West. These were soldiers, sergeants, and officers who knew how to

"drive with the wind and cut down the enemy with precision fire."

All around us was the vast "sea" of the steppe, covered with thick grass. There was nothing on it to catch a person's glance. The only salvation in such a boundless landscape was the ability to move on an azimuth. Day and night. For great distances. Without "His Majesty the Azimuth," one could not move a step in these regions! We had some semblance of "western" experience in moving by azimuth with the aid of the tank gyrocompass that was mounted on each Sherman. We were required to sharpen our previously acquired skills and adapt them to new and unusual conditions. Crew training was divided into two phases: the first was movement on an azimuth on a "dismounted tank;" the second was practice in this same task, but mounted on the vehicles. We planned parallel exercises on the design and function of the gyrocompass and how to use it.

Before their departure to start positions, the Soviet and Mongolian forces were concentrated principally in the northern part of the Mongolian People's Republic. Formations of 6th Guards Tank Army were positioned west, south, and southeast of the city Choybolsan, not far from the Kerulen River. In these areas were a small number of nomadic herders with all sorts of herbivorous small and large livestock. The staff officers joked, "There were never such densities of tanks, guns, cattle, sheep, and horses before a single operation in the West!"

We "westerners" understood that this "Mongolian phenomenon" was possibly due to several factors. The recent victory over Fascist Germany had radically changed the world situation. The fate of Japan — the Third Reich's last ally — had been sealed. The removal of the Mongolian peasant herders from areas of succulent grasses would cause significant damage to the Mongolian civilian economy. The grass in the western and southern areas of the country had all been consumed, and what remained had been dried out by the merciless hot sun.

Thus, we, tankers and herdsman, lived as good neighbors until the beginning of the August offensive.

At the same time, an order arrived on the conduct of a march and the occupation of a start position for the offensive in the area of Tamsag-Bulag. The 9th

Guards Mechanized Corps commander, General-Lieutenant Mikhail Volkov, planned for the wheeled vehicles to complete the movement in two legs, and the tanks in three. To avoid overheating the engines of the tracked vehicles, units were to move mainly at night. During the day, the troops rested and conducted maintenance.

For brigade and battalion commanders, crews, and engineer-maintenance personnel, the forced march to the border became its own form of "dress rehearsal" for the upcoming operation. Experience was gained in movement in extremely dusty conditions and in rapidly servicing vehicles at nighttime halts. The chiefs of the engineering-maintenance services came to the conclusion that in the desert and steppe terrain, the Shermans required replacement of track shoes every 300 to 400 kilometers, and complete rebuild of the track with replacement, for example, of one-third of its track shoes every 500 to 600 kilometers. The necessity of more frequent and careful checks of the lubrication, charging, cooling, and especially air filtration systems was emphasized.

By the morning of 8 August, forces of 6th Guards Tank Army were occupying their forward assembly areas for the offensive. We did not realize that only twenty-four hours remained until the start of combat activities.

On the Eve

The Manchurian strategic offensive operation (8 August to 2 September 1945) was one of the largest operations in the concluding stage of World War II. It is unequalled in a number of operational norms and characteristics. The combat actions were projected to unfold on the broadest scale: troops occupied start positions along a 5,000-kilometer line; the forces of three fronts were concentrated in a zone of 280 to 300 kilometers, which comprised 7 percent of the front as a whole.

The concept of the conduct of the operation against Japan envisioned forces of the Transbaikal First and Second Far East Fronts executing a rapid penetration into the heart of Manchuria on three strategic axes. The main attacks were planned to be launched from the territory of the Mongolian People's Republic to the east and from the area of the Soviet Primorya [that portion of the USSR bordering Manchuria on the east, basically south of Khabarovsk] to

the west. These two meeting attacks were separated one from the other (measured along the international boundary) by a distance of not less than 2500 kilometers. The forces had to capture important military-political and economic objectives in central Manchuria — Mukden, Chan'chun, Harbin, and Gerin — as rapidly as possible. This was to be accomplished by the division of the Kwantung Army's main forces into isolated pieces, with their subsequent encirclement and destruction in northern and central Manchuria. Transbaikal and First Far East Fronts were given a leading role in the operation. Forces of the Second Far East Front were launching a supporting attack from the Blagoveshchensk area in the general direction of Harbin. They were to assist in breaking up the enemy grouping and destroying it in detail. The three fronts had a total of eleven combined arms, one tank, and three air armies, and an operational group. These formations included eighty divisions (of these, six cavalry, two tank, and two motorized rifle), four tank and mechanized corps, six rifle and thirty separate brigades, and the garrisons of fortified regions [primarily artillery and machine gun units]. Of the 63 tank and mechanized formations deployed in the three fronts, 29 — more than 16 percent — were in the Transbaikal Front. This was on the axis of the most complex natural conditions, which the Japanese command considered insurmountable and unsuitable for use by large masses of forces and combat equipment.

Altogether, 1,566,725 personnel; 26,137 guns and mortars; 5,556 tanks and SAUs [self-propelled guns]; and more than 3,800 combat aircraft were concentrated in the Far Eastern grouping of Soviet forces. The overall superiority over the enemy was 1.2:1 in troops, 4.8:1 in tanks and artillery, and 3.6:1 in aircraft. On the axis of the main attacks, the Soviet command sought to create a decisive superiority in forces and means. Thus, on the Transbaikal Front, the correlation of Soviet forces to Japanese forces was 1.7:1 in infantry, 8.6:1 in guns and mortars, and 5:1 in tanks and SAUs.

Let's take the Berlin strategic offensive operation (26 April to 8 May 1945) for comparison. It was also conducted by the forces of three fronts. Sixteen combined arms and four tank armies, nine tank and mechanized and four cavalry corps, and four air armies



were allocated for the breakthrough of the enemy defenses. A total of 2.5 million men participated in this concluding operation for the defeat of Fascist Germany. 41,600 guns and mortars; 6,250 tanks and SAUs; 7,650 aircraft, and a portion of the forces of Baltic Fleet and Dnepr Flotilla were employed. And all these forces and means were deployed, in contrast to the Manchurian operation, on a continuous front in a zone of not more than 300 kilometers.

On the Central Manchurian Plain

Dropping down out of the mountains, the tankers rejoiced that they finally had broken loose from the "mouth of the dragon." They could see farther and breathe easier on the plain. As we later learned, our joy was somewhat premature. Our difficulties were not yet over. In comparison with our previous trials, they were twice or even three times worse. In other words, the severe testing of the Shermans and the verifying of their crews' endurance and courage would continue. On the first day of our movement toward Tunlyao, the soldiers expressed their attitude toward the developing situation with the words: "You are a broad valley, but we hate you!"

During the course of the march, each kilometer cost us immense effort, and twice the norm of fuel. The rains stopped briefly, permitting us to admire the limitless crops of succulent grasses, then again pelted our faces with torrents of water. The road surface became a thick porridge-like mash. In places, the tanks created a muddy bow wave ahead of them. We had to take the 160-kilometer distance to Tunlyao "by storm" over the course of more than two days. No consideration was given to maneuvering around difficult sectors of the route or increasing speed. For "everywhere one looked, it was swampy fields and, on the road, a meter of fermenting mud!" The *Emchas'* motors were stressed to the limit. They withstood the enormous strain well; not one broke down. Having crossed the Silyaokhe River by bridge, the brigade's units drew up to the western outskirts of Tunlyao on the morning of 19 August. This was the second large city on our route. It became, in its own

right, the jumping off point for an unusual and most difficult march.

Something unbelievable happened here. The roads leading from Tunlyao to the southeast were unsuitable even for the movement of tanks. The several days of pouring rain had turned the broad central Manchurian plain into a kind of artificial lake. In this critical situation, when each hour was precious, a uniquely practicable decision was made — to cross this submerged terrain on the narrow embankment of the railroad bed, from Tunlyao to Chzhan"u and beyond to Mukden. The total length of this "cross-tie road" was approximately 250 kilometers.

I remember that day well. When the chain of command's decision was announced, several of us veteran officers were somewhat alarmed. We understood too well that such a risky step was not taken on a whim. Two corps (5th Tank and 9th Mechanized) would be moving along a single slender thread. "He who has not fought in war does not know what risk is!" This is true. We wondered: How many "hidden boulders" were on this lifesaving, and dangerous, route.

It would be twice as difficult for the army's second echelon units, that is to say, for us, the "*inomarochniki*" [foreign-vehicle tankers], to move along the fairly well broken up railroad embankment. We had no doubts about this whatsoever. The rugged track system of the 32-ton T-34 had left the embankment in just such a condition. The Sherman was four tons heavier than the Soviet tank. This had to be taken into account.

The brigade's tanks drove up onto the railroad embankment south of Tunlyao. We began the march across the railroad cross ties. This continued for two days. All sorts of things occurred along this route. From the first meters, we felt the "charm" of the sole dry strip of ground. The ends of the ties were heavily splintered. Deep gouges remained from the tracks of 5th Tank Corps' T-34 tanks. The T-34, with a somewhat narrower track block than a Sherman (500 versus 584 millimeters), moved with the rails between its tracks. The *Emchas* were not able to do this. We had to drive with one track between the rails, and the other on the gravel ballast of the ties. In doing this, the tank leaned significantly to the side. We had to move more than 100 kilometers in this "lopsided" attitude. In addition, the vehicles vibrated on the ties, like they were in

convulsions. It was especially difficult when we encountered bridges. We had to go around them. In order to do so, we had to prepare dismounting and mounting points to get down off of and back onto the embankment. And all of this with the efforts of our crews and *desantniki*. True, we had all the brigade's units.

At 1700 on 19 August, my 1st Battalion — the lead unit in the column — reached Bakhuta siding. Here stood one modest brick building. The rain had stopped a short time earlier. The *Emchisti* and *tankodesantniki* were removing their wet clothing. As before, the water was all around us. An unusual engagement occurred at this point along our route of march.

Observers loudly shouted out: "Air!" The gun commanders in the crews rushed to their covered anti-aircraft machine guns. For several days now, we had protected them from the heavy precipitation. During the brief interludes between rains, they remained in the travel position. Prior to this, enemy aircraft had never bothered us. Now, six spots had appeared on the horizon, fighter bombers hurriedly approaching from the south. Our "westerners" had mastered well the tactics of German pilots. Before they dropped their bombs, they circled over the target. They selected the aiming point, and only after this, the leader turned his aircraft into a dive. But here, everything unfolded according to a different scenario. Events developed so rapidly that we did not even have time to bring our machine guns into action. How did this unusual Japanese attack conclude?

The first aircraft raced toward the battalion's lead tank at low altitude. And at full speed, it plowed into the tank's hull. Pieces of the fuselage flew off in all directions. The airplane's engine buried itself under the tank's tracks. Tongues of flame licked around the Sherman's hull. The driver-mechanic, Guards Sergeant Nikolay Zuev, received numerous cuts and bruises.

The *desantniki* from the first three tanks ran into the brick building in order to seek cover. The second Japanese pilot guided his aircraft into this structure. Crashing through the roof, it lodged itself in the attic. None of our soldiers were injured. It immediately became clear: kamikaze were attacking our battalion.

The third pilot did not repeat the mistake of his comrades. He dropped

sharply toward the ground and flew his aircraft toward a window of the building. He also was unable to reach his target. His wing caught a telegraph pole, and the fighter bomber crashed into the ground. It quickly burst into flames.

The fourth aircraft dived on the column. It crashed into a truck belonging to the battalion aid station, setting it on fire. The last two kamikaze directed their attack at the column's trailing tanks, and were met by a dense curtain of anti-aircraft fire. Struck by machine gun bursts, both aircraft crashed into the water not far from the railroad embankment. The air attack had lasted several brief moments. Six fighter bombers were turned into shapeless heaps of metal, with six dead pilots. What really surprised us, however, were the female corpses in the cockpits of two of the aircraft. In all likelihood, these were fiancées of the kamikaze pilots, who had decided to share the dismal fate of their selected ones. Our losses were insignificant: one truck burned, a gouged turret on the lead Sherman, and one driver-mechanic disabled. We quickly pushed the truck off into the water, sat the assistant driver-mechanic behind the controls of the tank, and continued the march.

By the middle of the day, the brigade's units had reached Chzhan"u. Here, to the great joy of the tankers and *desantniki*, we abandoned the railway and drove along the concrete. We immediately increased our speed to the maximum — just under fifty kilometers per hour. Even the "lame" tanks did not fall behind. Ninety minutes later, the column was once again forced to straddle the hated railroad tracks. It was sixty "vibrating" kilometers to Mukden.

The tankers had experienced much on the long journey from the forward assembly area: they scorched in the heat, bogged down in the desert sands, forced a track through the mountains (every minute risking a rollover), ate dust for several consecutive days, and washed it down with torrents of rain. It would seem that everyone had been driven to the brink. But no! A new problem arose — another obstacle. We had to cross the Lyaokhe River on a railroad bridge. This would be no simple matter. The "listing" Shermans did not fit between the [low] sides of the bridge structure. We had to "streamline" the vehicle. I thought about it, and the company commanders and bat-

talion staff sought a solution. We discussed various ideas. The best of these was to load the *Emchas* on platform cars and move them to the opposite bank.

We had to find platform cars, even just two or three. And a steam engine. We created two groups of scouts to go out and find the necessary equipment. One group was sent back to the station we had recently passed through, the second to the next station ahead. After about an hour, discomfiting news reached us. Platform cars of only sixteen tons capacity had been found, but no locomotives.

There was one way out: we had to push these loaded platform cars across the bridge by hand. A herculean task, for sure. We constructed a loading platform out of various makeshift materials, and maneuvered a single tank onto two platform cars. A team of twenty men was assigned to each platform. Their strength was sufficient to push, and to hold the valuable "cargo" on grades. The first shuttle was successful, but it took almost four hours. The axle boxes smoked from the inordinate overloading. We took various measures, such as pouring diesel fuel and oil on the bearings. And again we put them under the load.

The sweat poured off of our arms. Our hands bled from pushing and dragging all the Shermans to the opposite bank of the Lyaokhe River. We breathed a sigh of relief, then moved off toward Mukden. On the morning of 21 August, we reached its northwestern outskirts. The order came down to halt in the city.

Mukden

How long would we be in Mukden? At the time we still did not know that this was the final stop on the offensive advance by units of 9th Guards Mechanized Corps. 5th Guards Tank Corps continued to advance to Port Arthur and Dal'nya.

When the battalion had been in Mukden for about two hours, we were alerted. We received the mission to disarm a Japanese tank unit in a nearby sector of the city. The five-kilometer roadmarch required little time. We reached the objective: a military garrison of a Japanese tank brigade. We encircled it with our Shermans, their main guns and machine guns loaded. We were ordered to open fire on the garrison at the slightest sign of resistance.

The Japanese officer — a captain, with anger in his voice, reported to me in perfect Russian that they had received an order from their own command to surrender their arms. "What procedure do you wish us to follow?" he asked me.

We gave the following instructions to the Japanese officer: to surrender all small arms; where to drive and park the tanks and other combat vehicles; and where, after this had been accomplished, to assemble all the soldiers. Bogdanov also drew him a sketch indicating the locations of these points. The Japanese captain indicated his understanding of the instructions and returned to his unit. We worriedly waited the fulfillment of our requirements. Brigade and corps staff officers arrived to observe the activity, and I briefed them on the situation.

About an hour passed in waiting. As before, all was quiet in the compound. The *emchisti* were ready for anything. Suddenly, it was as if the Japanese were preparing for their last engagement. Inside the compound we heard the racing of tank engines. A light truck quickly appeared in the gates. Behind it followed several staff buses, and then the tanks. It was a brigade column. The lead tank came up to my Sherman and stopped. I was handed the TOE [table of organization and equipment] for the brigade, in Russian. This was a great surprise to us. It was clearly the work of the captain-negotiator.

The commanding officers of the units were the first to lay down their weapons. They immediately were seated in two light vehicles and taken to corps headquarters under guard.

For almost the remainder of the day we accepted the capitulation of the Japanese tankers. Fairness requires me to note that even in this difficult, disgraceful period, the officers, noncommissioned officers, and soldiers carried out every instruction regarding surrender of their weapons and equipment. Military discipline was maintained to the last fateful moment, when all of the more than 1,000 assigned soldiers of the brigade became prisoners of war. The final command was issued in Japanese and the former tankers, under heavy guard, marched off into Mukden, to a prisoner-of-war collection point.

I turned to the captain who had negotiated for the Japanese command with a question. "Captain, where did you learn



Russian so well?" Standing quietly for a moment, he replied, with some assertiveness in his voice, "It was my duty."

"Captain, how did you intend to fight against Soviet T-34s and American Shermans with such tanks as these?" I asked the Japanese captain-parliamentarian. Not concealing his enormous hatred toward us, the Japanese officer responded, "Captain, had there been a confrontation, had we seen your five thousand tanks, we would have found twelve thousand soldiers willing to sacrifice themselves."

The Japanese forces moved rapidly toward their fate. Garrison after garrison, position upon position laid down their arms. The Kwantung Army, like snow before the sun, melted away by the day, by the hour.

Notes

¹"Emcha" is a Russian nickname, a shortening of "M4." - Editor

²Tankodesantniki: a Russian term for accompanying infantry who rode on the tank's hull.

³Chernozem: the blacksoil typical of the Ukraine.

This article adopted with permission from *Commanding the Red Army's Sherman Tanks*, by Dmitry Loza, translated and edited by James F. Gebhardt, to be published in December. © by the University of Nebraska Press.

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The 3d Armored Cavalry Regiment's Tactical Command Post:

An Alternative Command and Control Facility

by Captain Christopher Boyle

Framework

Equipped with a large tactical command post, the 3d ACR decided to experiment with a smaller, more deployable regimental TAC. The old and cumbersome TAC consisted of three M577s (S3, S2, and engineer); three M113s (S3, FSCoord, engineer battalion commander); two command Bradleys; and five HMMV's. This configuration was too large and too difficult to set up and break down; the commander wanted a command post that could displace quickly, retain the ability to track current operations, provide a limited planning area, and be air deployable in support of the regiment's rapid deployment mission. The new concept, based on a model once used by the 11th ACR in Germany, eliminated the S3 and S2 M577s and replaced them with a 5-ton expandable van. Because a van was not available, the regiment used a modified M109 van.

Equipment

The regiment modified a standard M109 shop van to meet the regimental commander's command and control needs. The modifications were focused on three areas: the communications architecture, the continuous operations suitability, and the battle tracking sys-

tem. The communications structure in the M109 had to provide redundant, long range voice and data links to higher and subordinate headquarters. Our challenge was to maintain communications with the corps commander at potentially great distances while retaining communications with the regimental combat team. To accomplish these tasks, the regiment installed four SINCGARS radios used primarily for the regimental command and O/I nets and the corps command and O/I nets. The M109 van was equipped with whip antennae for the FM radios; therefore, the RTAC required no time to establish communications. The TAC personnel assembled OE-254s to increase the range of the FM radios when time permitted.

The regiment enhanced the TAC's communications capability by providing an MST-20 Single Channel Tactical Satellite (TACSAT) with an omni-directional antenna; this system established the communications link between the regimental commander and the corps commander. The regiment effected a voice and data link using a Multi-Subscriber Radio-Telephone (MSRT) equipped with a Crypteks secure fax. This equipment allowed the command group to pass information quickly and securely to the squadrons and to the corps. To pass selected, non-secure information, the regiment equipped the TAC with a 3W cellular phone. Although cellular phones were used rarely in tactical environments,

they provided another reliable form of communications at the regimental commander's disposal. The redundancy of the TACSAT, MSRT, Crypteks fax, four SINCGARS radios, and cellular phone ensured that a continuous communications link between regimental commander and the corps and squadron commanders remained intact.

The TAC used trailer-mounted, twin 3kw generators to furnish power to the M109 van. Twin generators provided continuous power and allowed the crew to service one generator while the other was in operation. With both generators mounted on a single trailer, the M109 van pulled its own power generation source. At least one generator was always operational; however, the M109 could operate for a limited time using the vehicle batteries. The two generators and the M109's battery guaranteed that the TAC always had power to operate.

Besides the considerable communications ability, the commander required an all-weather, day/night environment conducive to command and control of the regiment. The van's hard shell offered protection from the elements and a dry, comfortable work area. To control the climate inside the TAC, the van was fitted with a 3,000 BTU heater and 3,000 BTU air conditioner. With a controlled environment, the TAC could conduct 24 hour operations while providing necessary environmental control to the communications equipment. The

HQ-6	HMMWV	Regimental Commander Commander's Driver	COL SPC
HQ-3	HMMWV	Regimental S3 RS3 Driver	MAJ SPC
*HQ-66	M3A2	Commander's Gunner Assistant Gunner Driver	SSG CPL PFC
*HQ-33	M3A2	RS3 Gunner Assistant Gunner Driver	SGT SGT SPC
HQ-37	M109	Truck Commander (Shift NCOIC) Driver	SSG PV2
HQ-36	HMMWV	RTAC NCOIC Driver	SFC(P) PFC
HQ-33 (Engineer)	M577	S3 Engineer Battalion Track Commander Driver Crewmen x 3	MAJ SFC SPC SPC
*HQ-66 (Engineer)	M113	Commander, Engineer Battalion Track Commander Driver	LTC SSG SPC
*HQ-66 (Artillery)	M113	FSCoord Track Commander Driver	LTC SSG SPC
HQ-38	M113	RS3 Battle Captain x 2 RS2 Battle Captain RS2 Battle Captain Driver Generator Mechanic Shift NCOIC Shift NCOIC	CPT CPT SFC PV2 PV2 SFC SSG
HQ-6P	OH-58	Pilot Crew Chief	CW2 SPC
	HMMWV	Air Liaison Officer Assistant	MAJ SSGT
*During battles, the command vehicles moved forward.			

Table 1

regiment mounted two fluorescent lights from a Modular Command Post System tent which proved to be significantly cooler inside the M109 than the standard lights built into the shelter. To ensure light discipline, we constructed a custom-fitted boot to fit over the exit of the truck entrance to the tent. The boot prevented light from escaping and provided more room to operate when temporarily halted. The additional space allowed the regimental commander to plan and conduct rehearsals in limited visibility conditions forward on the battlefield.

With an all-weather environment and an effective communications platform, the next concern was the battle-tracking system. The TAC crews used two map boards: a current operations map consisting of friendly and confirmed enemy locations, and an intelligence map, consisting of templated enemy lo-

cations and likely courses of actions. The consolidation of enemy and friendly locations on one map provided the regimental commander with a timely picture of the regiment's battle space. To assist the commander in making decisions based on the current situation, the TAC maintained combat power charts down to the troop level. Each of the regiment's combat systems was included on these charts. With this system in place, the TAC could provide the commander, the TOC, or the corps headquarters with the friendly and enemy situations and the current combat status of the regiment.

The equipment was the infrastructure of the TAC. With an unflinching communications architecture, a secure, comfortable work area, and a simple battle tracking system, the TAC was successful in assisting the regimental commander in fighting the regiment.

Personnel

The next challenge was to tailor the TAC personnel manning to accomplish the mission both inside and outside the vehicle. The main constraint of the TAC was the limited space inside the van; only five personnel could effectively work inside. To remain effective, the TAC required a staff tracking enemy and friendly operations and a command and control element to supervise the security and operations outside the TAC. To accomplish these tasks, the regiment utilized the soldiers at the TAC as shown in Table 1.

The crews that operated inside the TAC aided the commander by providing him with a clear picture of the friendly and enemy situation. A normal shift at the TAC consisted of an S3 battle captain, an S2 battle captain, and a shift NCOIC. During battles or other peak times during the operation, two S3 battle captains surged to enhance battle tracking and command and control of the regiment. Maintaining S2 and S3 battle captains in the TAC allowed outstanding situational awareness. The S2 battle captain maintained a situation template on the intelligence map and posted known enemy locations on the operations map. Enemy locations transposed on the operations map provided the regimental commander a clear picture of the battlefield and facilitated analysis of the enemy's courses of action.

The battle captains were assisted by the shift NCOIC who tracked and reported required information, i.e., combat power and unit locations. The shift NCOIC also maintained the equipment inside the TAC. He ensured that communication with higher and subordinate headquarters was maintained and that all equipment inside the van remained combat ready.

While the crews inside the TAC were tracking the battle, an outside crew ensured that the TAC remained secure and provided for continuous operations. The crew outside allowed the soldiers inside to focus on their primary task, aiding the regimental commander.

To ensure success, the regiment assigned an SFC(P) as the TAC NCOIC. He developed and supervised the security plan, supervised maintenance, and

ensured that the TAC received necessary logistics support. With a senior NCO operating in this capacity, the battle captains were able to focus on their duties and to maintain a sleep plan.

Support

The TAC never lacked for logistical support because the regimental HHT 1SG ensured that we received a LOG-PAC daily, and sometimes twice a day. To facilitate the HHT commander in his logistical planning, the TAC submitted a logistics request to HHT daily. Face-to-face communications with the LOGPAC personnel, and an accurate estimate of the logistical support required, expedited the process. A clear communications link to HHT, an NCO who monitored the TAC logistics status, and a supportive chain of command set the conditions for success.

Operations

Operations inside the TAC were similar to those in any TAC. Normally, the regimental commander and S3 fought forward from their Bradleys. Occasionally, during battles when the regiment was spread across a wide front, the S3 operated from the TAC while the regimental commander utilized his command console in the UH-60. The TAC provided an excellent platform for the S3 to recommend critical decisions: priorities of fire for high payoff targets, close air support, and committal of the reserve. The TAC provided a command and control center to communicate with subordinate, higher, and adjacent unit headquarters and the regimental commander. The S3 could track operations effectively throughout the regiment's battle space.

Security

With the regimental commander, the S3, and at least two battalion commanders sometimes at the TAC, it became a high value target, and security was a chief concern. The majority of the TAC's security was passive, although available weapons systems were used to help secure its perimeter.

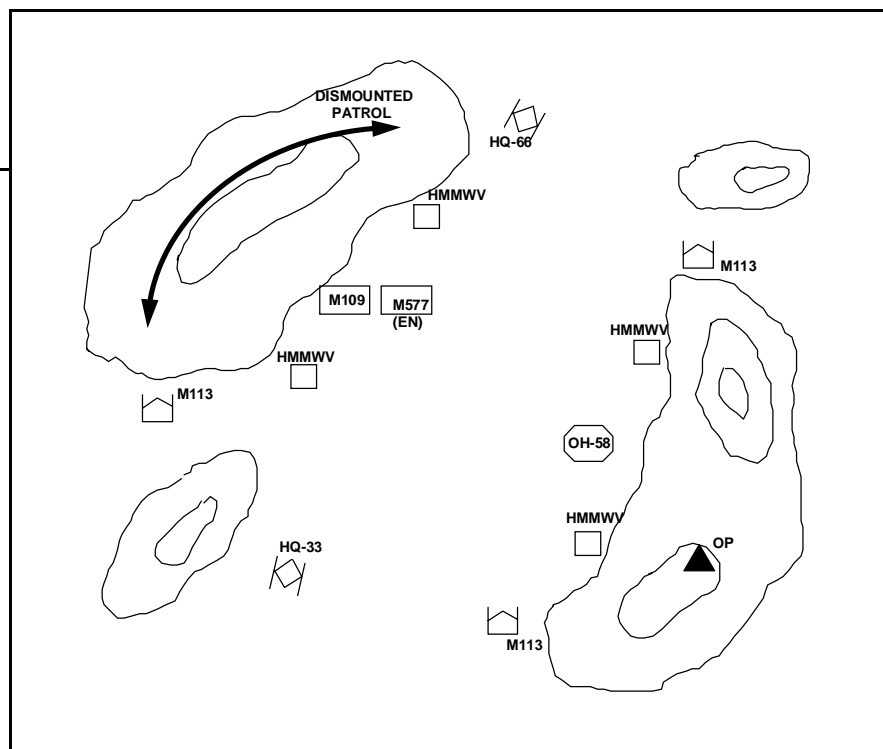


Figure 1. RTAC configuration in an unsecure area with command Bradleys

To prevent detection, the TAC relocated at least once a day. Because the TAC was extremely small, breakdown took only 20-30 minutes, much faster than the Regimental Tactical Opera-

tions Center (RTOC). To decrease the time required to displace the TAC, soldiers kept all equipment stowed, including their personal gear. The only time-consuming processes remaining

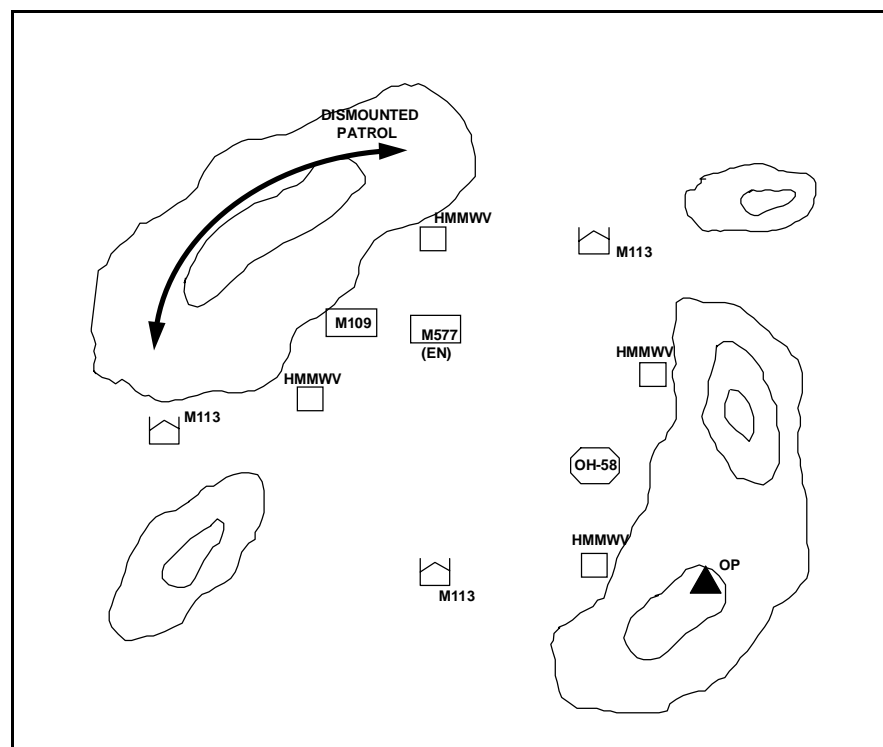


Figure 2. RTAC configuration in an unsecure area without command Bradleys

were the disassembly of the OE-254 antennae and the combat rolling of the camouflage nets. Realizing that this equipment required the most time to assemble and disassemble, the NCOs meticulously trained their soldiers on these tasks. To decrease the set-up and breakdown time, the TAC decreased the soldiers on security and inside the van and utilized them to prepare for displacement. While the soldiers broke down the TAC, a small quartering party departed to recon the new location.

While most of the TAC soldiers were breaking down equipment, the S3 battle captain not on shift would fly to the new location using the OH-58. If the OH-58 was unavailable, the quartering party used a HMMWV or an M113. The OH-58 would provide early warning until local security was established. Smooth quartering party operations facilitated the movement of the TAC into new vehicle positions and limited the signature of a command post entering the area.

The considerations used in choosing TAC locations were simple: defensible



The regimental TAC and its twin 3kw generators.

terrain, cover and concealment from mounted and dismounted observation, excellent communications with subordinate and higher headquarters, and accessibility to the regimental commander.

The TAC, due to its small size, could easily hide in wadis and ravines, which made the TAC virtually invisible unless the observer was within 200-300 meters. The only exposed parts of the TAC were the antennae heads.

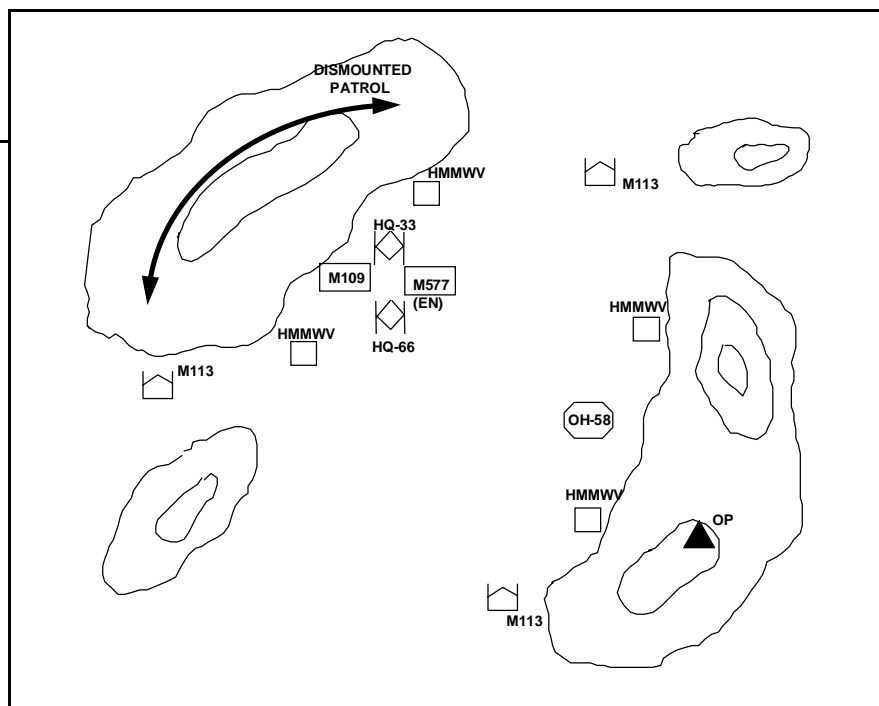


Figure 3. RTAC configuration in a secure area

Besides passive security, the TAC established a 360-degree perimeter around the M109 van. The two command Bradleys defended the most likely avenues of approach. The three M113s secured the remainder of the perimeter. To prevent a dismounted attack, an OP and a patrol secured the dismounted avenues of approach (Figure 1).

When the command vehicles were away from the TAC, the S3 M113 would defend the most likely avenues of approach and the perimeter would be reduced in size (Figure 2). When the TAC was located in a secure area, the command Bradleys were placed ramp to ramp under the SICUP (Figure 3).

Deployability

The regiment deploys the TAC as the Regimental Assault Command Post. In this capacity, the TAC serves as the initial command and control node controlling the reception of the regiment. The TAC is deployable on a C-130 or larger aircraft and has the organic equipment to control the regiment.

Summary

The 3d ACR TAC is a viable alternative to conventional TACs. Its communications platform, battle tracking ability, and stealth allow it to aid the commander in the command and control of the regiment. Its personnel manning and the climate control system allow the TAC to remain combat effective over long periods of time. Small and mobile, the TAC provides the 3d ACR with the flexibility to quickly establish a command post to successfully control regimental operations. The smaller command post facilitates the regiment in rapid deployment operations with no degradation in communications capability.

Captain Christopher Boyle is a 1990 graduate of the U.S. Military Academy. He served as a tank and scout platoon leader in 3d Squadron, 2d ACR, and as a tank, support, and scout platoon leader in 2-37 Armor. He was the regimental training officer in 3d ACR prior to his current assignment as commander, L Troop, 3d Squadron, 3d ACR.

Company/Team Command Post: The Missing Link

by Captain Dave Thompson

The ability of the armor or mechanized company/team to accomplish its myriad of tasks during preparation for combat is greatly enhanced by a functional command post (CP).

As observed during NTC rotations, the CP is often only a physical point in the assembly area where the command vehicles are located. Information flow, timeline management, and accurate tracking of the unit's status during the planning and preparation phases are lacking. That is not to say that there is no emphasis on how a CP should operate, or what it should look like, but generally, there is not an orderly, SOP-driven approach to CP operations.

Furthermore, our doctrine does not adequately address this issue for the armor or mechanized infantry company/team. While it does mention the numerous tasks that must be accomplished during planning and preparation, FM 71-1 does not include anything about the use of a command post. FM 71-123 states, "Companies have command groups rather than CP facilities. CP functions are normally conducted by the company XO from his tank." This lack of a doctrinal base, coupled with an inability to effectively manage information, result in a piecemeal effort by the company/team to accomplish all of the commander's priorities. This ultimately leaves critical tasks incomplete and important information uncommunicated to subordinate leaders.

When discussing the nature of CPs at higher levels of command, FM 101-5 states: "The commander also establishes procedures which clearly identify those CP activities and functions that must be accomplished on a routine basis...." The commander has the same responsibility at the company/team level. Therefore, it is incumbent upon the commander to develop his own techniques.

The following is a guide compiled from the suggestions of observer/controllers at the NTC. It is important to keep in mind that this guide is intended to assist company commanders in developing a command post SOP for the planning and preparation phases, while the unit is relatively static. While on the move, the company/team XO performs the necessary CP functions, and the first sergeant takes over when the XO becomes involved in the fighting (FM 71-123).

Company/Team Command Post

- 1. Purpose:** To enable the company/team to effectively accomplish battle preparation by providing a centralized point for information gathering and dissemination, coordination, time management, and tracking of unit status (Figure 1).
- 2. Functions:** The commander has numerous options in determining what, and who, the CP should consist of. Re-

gardless of the physical configuration, it is the *function* of the CP that is critical. Good results are obtained when an information manager is designated to operate the CP. In an armor company/team, the information manager should be an NCO from the HQ platoon, preferably the master gunner or the NBC NCO. Although duties pursuant to their primary positions will pull them away at times, more often than not they are available to perform as the commander's information managers. In a mechanized company/team the information manager should also be an NCO from the HQ platoon, preferably the master gunner or the commo chief. The requirement for additional personnel in the CP can be met by rotating soldiers from the HQs platoon. These may include available crew members from the commander's and XO's vehicles, medics, FISTV crew members, and the driver of the first sergeant's M113 in an armor company/team. The information manager utilizes these personnel to assist in accomplishing the CP tasks listed in Figure 2.

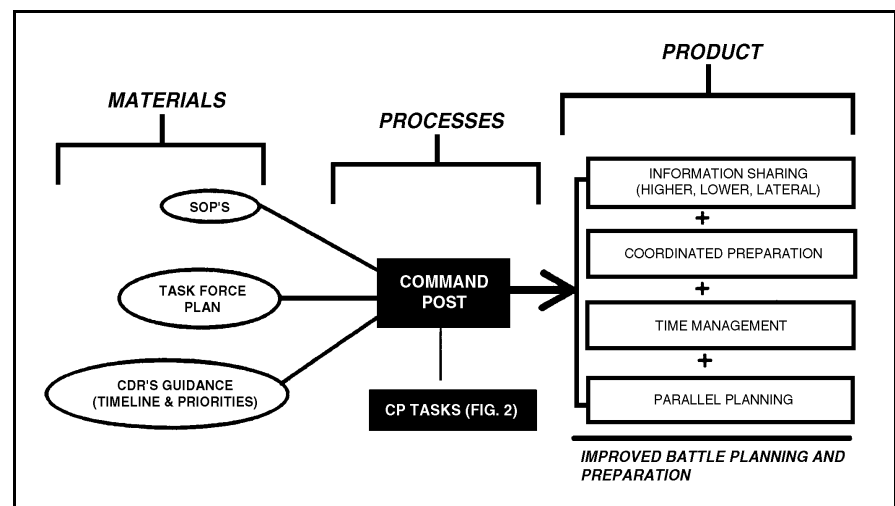


Figure 1

Among its more important tasks, the CP records incoming information (intel updates, directives from battalion, adjacent unit coordination requirements, logistical information, etc.). It also ensures that information required by the task force TOC is passed on time. Additionally, the CP is responsible for maintaining the commander's timeline. That is, it verifies that subordinate elements are accomplishing the commander's priorities and then records this information in a manner that allows the commander to get a quick, accurate status of the unit's preparation. This prevents the commander from having to individually poll each platoon.

It is important to note that, in order for the CP to be able to effectively manage the commander's timeline, the platoons must be able to update the CP at any time. Platoon leaders must *push* information, rather than wait for a query from the CP. In this manner, the commander can make rapid, informed decisions about adjusting his timeline. For example, if the platoons have accomplished all the platoon-level preparation possible, *and have duly reported that*, then it is possible for the company/team to embark on some of its collective tasks. These may include mounted drills and rehearsals. The result is that time is saved, which allows the company/team to deal effectively with unforeseen requirements (screen mission, new task organization, etc.) as well as handle setbacks such as maintenance problems — while still accomplishing those tasks that the commander has prioritized. The CP is the “enforcer” of the commander's timeline.

The CP also acts as the point of contact for attachments. For example, if an engineer platoon is attached to the company/team sometime during the plan/prep phase, the platoon leader reports to the CP to conduct coordination, instead of attempting to find the commander or someone “in charge.” At the CP, the information manager can gather critical information (headcounts, fuel and ammo status, special requirements, etc.), and the attached element can be apprised of the current situation and informed of any applicable SOPs. The platoon can then be integrated into the company assembly area. The most important advantage is that it requires no immediate personal involvement of the commander, XO, or first sergeant.

In this way, planning and preparation continues without distracting key leaders. Key leaders are often absent from the assembly area while preparing for combat operations; therefore, a well informed, capable CP is necessary in order to get attachments integrated into the team quickly.

In order to speed the dissemination of plans, the CP is where written orders are prepared and overlays reproduced. Since CPs are sheltered (section 3, Configuration), these tasks can be performed in any weather. Because there is room and a map available, the CP can also be used to deliver the operations order to subordinates. Although it is best to visualize the operations order while looking at the terrain, some circumstances, such as darkness or inclement weather, might prevent that, which makes the CP a good backup. The construction of a sand table of the area of operations is another CP responsibility. The same sand table may be used during orders for walk-through rehearsals, briefs, and subordinate planning, giving the entire team a common picture of the terrain.

All warning orders are posted in the CP as well as the current MCOO (modified combined obstacles overlay) and initial SITEMP. In this way, the CP enables the commander and platoon leaders to *plan in parallel*. With this information readily available, subordinate leaders can utilize it very early on to begin their own Troop Leading Procedures (TLP). The benefit is a time savings that is realized at the company/team operations order when platoon leaders come fully armed with a good picture of the commander's terrain analysis and enemy situation. If forced to wait until the operations order for their first look at the terrain and threat courses of action, platoon leaders

CP Task List

1. Post timeline (adjust as needed or directed)
 - This includes all of the commanders priorities: boresight, PCC, PCI, recon, TF OPORD, company/team OPORD, rehearsals, resupply, PLT OPORDS, time windows for dozers, etc.
2. Post unit status (see Figure 3, tracking charts)
3. Record and pass on information (monitor TF and company/team cmd nets)
 - a. Intel updates
 - b. Warning orders
 - c. Task organization changes
 - d. Logistics information
 - e. Any directives from TF
 - f. Required reports to TF
4. Integrate attachments
5. Post map
 - a. Current area of operations
 - b. MCOO
 - c. Situational template
 - d. Operational graphics
 - e. Logistics graphics
6. Build sand table of area of operations
7. Coordinate reproduction of overlays/orders
8. Assist first sergeant and XO in coordination for logistics support as required

Figure 2

are hard pressed to accomplish their own TLP to standard.

The CP also assists in the sustainment of the company/team by collecting logistical information with which the XO can begin to derive a plan for support. Some of the charts in Figure 3 deal directly with logistics issues. Using these charts to visualize the logistical status of the unit enables the commander, XO, and first sergeant to quickly assess potential problem areas and take necessary action. The first sergeant is also able to make use of this information in the preparation of his daily logistics report. If the information is accurate, it will reflect the on-hand quantities of critical supplies and personnel. This allows the assembly of customized LOGPACs that resupply the company/team with what it actually needs. No longer is the first sergeant the central point for logistical information collection. Instead, the CP performs that function, and as a result adds flexibility to the first sergeant's schedule.

As of: _____

CURRENT COMBAT POWER

TANKs/BRADs/INF SQDs

	Location	Weapons Systems	CLASSV Per Veh	Remarks
1st Plt				
2nd Plt				
3rd Plt				
HQ Sec				
FISTV				
Atch				

PERSONNEL STATUS

	# Auth	# curr On Hand	# on Logpac	Remarks
1st Plt				
2nd Plt				
3rd Plt				
HQ				
FIST				

ATTACHED/OPCON

	I/U Time Location	Call Sign	Internal Freq.	Remarks
Scouts				
Mortars				
ENG				
ADA				
FIST				

TIMELINE

MAINTENANCE

	FMC/NMC	Location	Co/Trm Priority	Est Repair Time
1st Plt				
2nd Plt				
3rd Plt				
HQ				
FIST				

CRITICAL SUPPLY

	III	IV	V	Remarks
1st Plt				
2nd Plt				
3rd Plt				
HQ				
FIST				

G=90% OR GREATER
A=50% TO 89%
R=49% OR LESS
B=0 BALANCE

Figure 3

3. Configuration: There are a number of good ideas on how to properly configure a company/team CP given current MTOEs. Regardless of the specific setup, a CP must be austere, which allows for rapid displacement. There exists a point of diminishing returns when a CP is outfitted with too many bells and whistles in an attempt to further enhance its function. The configuration offered here results from observations of successful techniques applied during NTC rotations.

The armor company/team is best served by utilizing the first sergeant's M113 armored personnel carrier in conjunction with a shelter as its CP. This works well as the first sergeant rarely has a need to use the M113 dur-

ing planning and preparation. Many options are available when considering which shelter to use. The canvas extension originally designed for the M577 command post vehicle can be used with the M113. Another option is to use a tent (GP small) with the radios remoted from the M113. The preferred method is command post, modular (NSN 5410-01-334-7529). It is easily set up and stored, and is waterproof. There is enough room to mount a map and required charts, as well as accommodate numerous personnel. Another technique is to use the FISTV with any of the shelters mentioned. However, the FISTV may come under the control of a higher headquarters (due to its unique capabilities) and leave the company/team. This makes the first ser-

geant's M113 the best choice since it is organic to the company/team and usually remains there.

The mechanized company/team can use a Bradley from the HQ platoon with a shelter. Keep in mind that using a combat vehicle poses some problems, due to its need to be boresighted and armed. These activities usually require the vehicle to be moved, as does participation in mounted rehearsals. Again, the FISTV is also an option.

4. Task List and Tracking Charts: Figure 2 is a listing of the minimum tasks performed by the CP in order to provide the advantages discussed previously. Additionally, in order to give the commander a clear snapshot in time of the status of his unit, the information manager can make use of easily updated charts. Figure 3 is a compilation of these charts.

With digitization on the near horizon, more battlefield information will become available at much accelerated rates. This, in turn, should allow commanders at all levels to accelerate their decision cycles. The desired result will be rapid tempo operations that allow the enemy little or no time to react. Success, in part, will depend on our ability to manage and assimilate this ever-increasing volume of information. The command post function will take on even more importance as commanders attempt to "balance the scales" between rapid action/reaction and the necessary preparation for combat (troop leading procedures and priorities of work). Better technology helps to alleviate this conflict to some degree, but the bottom line remains — less time is available to accomplish the same number of tasks. The company/team must be able to manage time, information, and resources, and the company/team CP is the tool to use to get the job done.

Captain Dave Thompson was commissioned in Armor in 1986 from Texas A&M University. He is currently serving as an armor company/team combat trainer at the National Training Center.



Team 2-70 Armor executes a LOG-PAC during training at Hohenfels.

Improving Your Company Trains Operations

by Captain Andrew I. Green

The wind blew cold over the plains of Hohenfels...

The commander sat back; his armor team had just fought a pitched battle with the enemy forward security element of the OPFOR battalion and had utterly destroyed them. He had suffered some losses, but nothing compared to the destruction he had dealt to his foe. He could taste the praise his battalion commander would give him for his victory; he would be a hero among the commanders. All of his months of training and preparation had finally paid off.

Now, he waited for the 1SG to bring forward the company trains and begin the less glamorous job of casualty evacuation and vehicle repair and evacuation. He watched the trains begin their work. For some reason, things weren't going well. His medic track mistakenly went to a tank that only had a slightly wounded tanker on it while bypassing several tanks with soldiers needing immediate evacuation. His M88 recovery vehicle and maintenance M113 waited on the road for someone to guide them to a downed vehicle and for the medics to clear the battle area. He could hear the frustration of the platoon sergeants and platoon leaders on the company radio net as they tried to

guide the medics and mechanics to the less obviously damaged vehicles. The commander had to admit that, until you could get close enough to see their bumper numbers, all the M1s and M2s looked the same.

As time went on, things got worse, the medic track quickly filled up, and many wounded still needed evacuation. The commander, in an act of desperation, tried helping out by sending in his HMMWV, but it got tangled in barbed wire and now was down for maintenance. His M88 was lost looking for a stuck tank in a well-concealed position. When the tank commander tried to give the mechanics his position using company graphics, he discovered that the M88 driver had used the map board as a lunch tray and the correct checkpoint was buried under yesterday's "Pork in BBQ" sauce.

Now things became desperate; many of his company wounded in action (WIAs) were now dying of their wounds. There were too many casualties and not enough evac vehicles with room to put the litters. Every time his medics took another load, it seemed like forever before they returned. The battalion medic assets that he had always counted on to help weren't avail-

able. In addition, his maintenance team was lost, and required someone to go find them and bring them back to the company area. To top it off, his 1SG had to leave to pick up an incoming LOGPAC. In desperation, he called in his XO to bring order to the impending chaos, but even with both of them coordinating the support effort, it seemed like no one knew what they were doing.

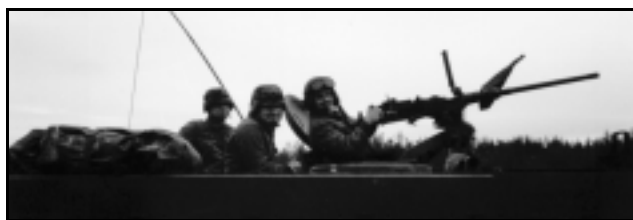
In the end, many of the commander's soldiers died of wounds, he lost his M88 to a minefield, and only half his vehicles made the follow-on mission due to many missing the LOGPAC and running low on fuel. The welcome he received from the task force commander differed radically from the one he had envisioned.

Making the Plan

How can we, as armor leaders, keep this from happening to us? The answers can't be found in FM 71-1, FM 71-123, or FKSM 17-16. They deal with armor team operations but, other than generalizations, give little specific guidance. As with many important lessons, one must use many different sources and personal experiences to fix these problems. Here is one solution.

Trains Training at Hohenfels

At right, mechanics from B Co., 2-70 Armor train with crew-served weapons. Below right, Headquarters Platoon recovery team, which recorded the fastest recovery times of any 1993 CMTC rotation.



Below, mechanics fix a tank at a unit collection point.



Effective company trains operations can be the key to a successful NTC or CMTC rotation and are critical to any combat situation. Unfortunately, we rarely train them as intensely as we do our combat drills. Most good ISGs can handle LOGPAC operations, casualty reporting, and company trains operations during limited platoon and company ARTEP training events. Unfortunately, these offer few opportunities to train casualty and vehicle evacuation operations with all the distractions of realistic training or combat. With lane training and reliance on using the local training area, it's rare that company trains players deal with land navigation, evacuation, or recovery operations above the platoon level in an unfamiliar environment. LOGPAC times are often structured and routine, with plenty of "admin time" to allow everyone to find the assembly area and eat a leisurely meal. Vehicles with major maintenance problems are often towed back to the motor pool and worked on in the rear, as no one wants to have any extra vehicle down days against their Operational Readiness rate. The medics generally are whatever team is available and don't look at their maps as, "they know the area." These situations don't train the key players in the company post-battle operations to the level required at the training centers or in combat.

Where does one start? First, the CO, XO, and ISG must decide on a plan to improve their trains operations and set goals to work on identifiable weaknesses. A commonly understood, easily recognizable signal system must also

be created and disseminated to each vehicle in the company, with extra sets of signal material ready to provide to attachments and slice elements. VS-17 panels and gunnery flags work well for this.

Next, set aside time to rehearse and train full-scale post-battle operations. One idea is to practice casualty evacuation play at a SIMNET event with platoon sergeants reporting, the medic team and maintenance team chief role playing their part of the operation and keeping records on the vehicles down and casualties reported. All LOGPAC operations should be a rehearsal for the real thing. Vary the technique, decrease the time allowed, hold the soldiers to the standard every time, and keep security and vehicle density to a minimum. The ISG is the key, and he has to be the enforcer of the plan. Therefore, he must believe in it and hold the rest of the company to the commander's standards.

Casualty Evacuation

One medic track isn't enough! Combat lifesavers can stabilize the wounded, but most wounds typical of armored combat (burns, major punctures, and amputation injuries) require rapid medical evacuation and skilled medical treatment. Using operable combat vehicles to evacuate the wounded in an unsecured battle area is not practical, as it is rarely obvious when a lull in combat will occur and how long it will last, so it is impractical to allow soldiers to leave the battle area with one of your major weapons and

evac the wounded. Wheeled vehicles are rarely practical in the main battle area because obstacles and munitions abound that will soon render them inoperable. Therefore, the M113 armored medics are still the primary casualty evacuators. With some prior planning, the company commander can triple his casualty evacuation assets. All the company M113s can be fitted with litter kits and carry litters tied to the top or outside. Casevac takes priority over vehicle recovery, so the ISG's and the maintenance track can also help with medical evacuation until the medics alone are able to handle the flow of wounded. Wheels can be consolidated into a casualty transfer point on a safe intermediate rear area road position, and casualties transferred, thus keeping the tracks closer to the battle position. Good rehearsals are the key to this operation, and at least one combat lifesaver in each vehicle is a must. Route recons are also critical, and ambulance transfer points, locations of main and jump aid stations, battalion and company checkpoints, and all combat vehicle positions, if possible, must be passed down to every vehicle in the company. The ISG must play traffic control boss and direct the medevac vehicles to the wounded, as the reports come in, while evacuating wounded in his track. It's hard, but the results are worth it.

Vehicle Recovery

The M88 is an underutilized asset, usually maintained in the rear as time permits. It is allowed to sit idle most of the year, employed only to pull packs

during services or driven to assembly areas to sit until someone gets stuck or needs to be dragged back from ARTEPs. The M88 driver generally follows the ISG or some other guide, rarely land navigates, and uses map boards for card tables and food trays. If anyone has the wrong mission graphics, it is liable to be the mechanics. The correct graphics for the current mission are usually stuck in a cubby hole or under someone's tool box in the crew compartment. The reason: few leaders expect more from these soldiers, or take the time to train them. Fixing this problem is crucial to improving your vehicle recovery operations. With the maintenance team chief doing casevac, the M88 is unescorted on the battlefield; this is his time to shine. With a working knowledge of the plan, and platoon sergeants calling for assistance, the M88 crew can begin the vehicle evacuation process before the battle is over. All non-functioning combat vehicles need to be taken off the battlefield eventually, and it is better to start early than wait until it is too late.

To facilitate faster maintenance and battle damage repair, the vehicle collection point should be in a relatively safe area to the rear of the immediate battlefield. Ensure that this area isn't too close to casevac routes or supply routes, as once vehicles are being maintained, they can be hard to move. The benefits of using a company-level maintenance collection point, run by the maintenance team chief, are many. Security improves as mutual support from semi-combat ready vehicles can overwatch those less able. Vehicles evacuated there can be worked on more safely until all of the down vehicles are collected, parts cross-leveled, and maintenance priorities established.

The limited number of company maintenance personnel and their equipment can be co-located to speed repair and recovery times. Vehicles obviously in need of evacuation can be sent rearward after being stripped of needed parts to repair other, less damaged vehicles. Resupply of this area is easier than trying to find individual downed vehicles for LOGPAC operations. Interplatoon recovery is enhanced because the company maintenance area can allow combat vehicles to tow damaged vehicles to safety and more quickly return to the combat area. Finally, if task force recovery assets move forward to assist the company/team, it is much faster if they go to a single location, rather than wandering around an unfa-

miliar battlefield looking for broken vehicles.

Security Is Everyone's Job

The combat trains must also be able to fight. These forward operations require the support vehicles to operate semi-independently and in an unsecured battlefield. The crews of vehicles with crew-served weapons must be comfortable with their ability to use the weapons and may need to be augmented with AT-4s and small arms. MILES gunnery for training events must also be taught to support soldiers so that they see some reason to fire their weapons. This, of course, means that they must be given ammunition during training events, something that many mechanics don't ask for and, therefore, don't receive. The company trains can also improve their fighting ability by placing your attached air defenders in their M2 vehicles between them and the company during movements, or with them when stopped. The Stinger's long range will reach past the combat vehicles in front and the Bradley 25-mm chain gun can kill any marauding BMPs that threaten your trains.

One final asset that can be used better is the company master gunner. He can aid the ISG in reporting during the reconstitution phase of post-battle ops. If given the role of CINC/wheels, he can provide senior leadership in the casualty exchange point and when the ISG is rearward doing LOGPAC operations.

Conclusion

Good casualty and vehicle evacuation operations require innovative use of company assets, prior planning, and rehearsals. A simple plan, well rehearsed and enforced, as well as the complete inclusion of all company members in during- and post-battle operations, will ensure that no soldier or vehicle is lost due to wasted time or lack of coordination.

Finally...

The commander sat back, his armor team had just fought a pitched battle with the enemy forward security element and had destroyed them utterly. He had suffered some losses, but nothing compared to what he had dealt to his foe. All of his months of training had finally paid off. He waited for the ISG to bring forward the company trains and begin the essential job of

casualty evacuation, and vehicle repair and evacuation. His men were his primary concern now, and he demanded that they be taken care of. He watched the trains begin their work. His casevac track went to every vehicle with wounded, most serious to less urgent, as shown by his easily-identified-from-a-distance company marking system. His ISG coordinated the effort with a practiced ease, guiding the M113s using company and task force graphics to each vehicle. His M88 recovery vehicle tirelessly drove around the battlefield, dragging the damaged vehicles to the vehicle collection point, where mechanics waited to work on repairing any that could be quickly returned to combat. He could hear the platoon sergeants and platoon leaders as they reported their losses to the master gunner who sent the reports to the task force until the ISG was finished with casevac. His M88 bypassed a minefield that was on his graphics and recovered a stuck tank in a hard-to-find wood line.

His medevac times were once again excellent, and didn't slow as his ISG left to go pick up an incoming LOGPAC. The battalion medic assets that he had always planned on to help weren't available, but they were able to use the commander's and the ISG's HMMWVs to speed the most seriously wounded to the jump aid station. In the end, the commander had succeeded, with all of his vehicles making LOGPAC, and being the first company to be Redcon 1 for the task force's next mission. Needless to say, his company received high praise from their observer/controllers and, more importantly, from the task force commander himself.

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Training the Task Force Scout Platoon

by Lieutenant Colonel Rick Lynch and Captain Steve Cichocki

One cannot overemphasize the importance of the scout platoon to the task force commander. That platoon is truly the eyes and ears of the commander, and must be trained to an extremely high level. The purpose of this article is to share some thoughts and ideas on how to do this.

Our observations are based on two years of experience training the scout platoon of Task Force 1-8 Cavalry, 1st Cavalry Division. We used the First Cavalry Division Scout Platoon competition in 1993, and the III Corps Cav Cup competitions, to determine if our training program was properly focused. Specifically, we evaluated zone recon, screen, land navigation, enemy identification and doctrine, indirect fires, and communications during both competitions, and the task force scout platoon performed well, winning the Division 1993 competition and placing as the top HMMWV scout platoon in the 1994 III Corps Cav Cup. The true test came in March 1995 during the National Training Center (NTC) rotation. The scout platoon performed assigned missions admirably.

First and foremost, it is critical to define duties and responsibilities as we develop the training plan. Who's in charge of what? The task force commander has primary responsibility for training the scout platoon. He cannot delegate that. He knows what he expects from his scout platoon, and he has the authority to allocate necessary resources to ensure that the training is properly conducted. The task force commander also has the responsibility to ensure he has the right guy as his scout platoon leader. As a rule, this should be a seasoned platoon leader



who has attended the Scout Platoon Leader Course (SPLC). Specific competencies desirable in a scout platoon leader include confidence, stamina, endurance, and mature judgement. The task force commander must be willing to have a close personal relationship with his scout platoon leader. Their relationship must evolve to the point where the scout platoon leader knows what the task force commander wants, sometimes even before the commander asks for it.

The task force commander must allocate time and resources to the scout platoon to effect its training plan. All too often, the scout platoon gets detailed out on miscellaneous tasks which pull members of the platoon from critical training. The task force commander must prohibit that. One technique is to provide blocks of "protected time" for the scout platoon. The place to spend this protected training time is in the field.

The commander has sole ownership of the scout platoon. The scout platoon leader does not work for the S2 or the FSO; he works directly for the commander. All too often, the scout platoon

leader is overwhelmed by the number of "bosses" he has. When the commander allocates protected training time, the scout platoon leader must fiercely defend it. All the soldiers must participate in the training. He must bring problems to the attention of the commander immediately.

The scout platoon leader is the platoon's principal trainer. He knows what the battalion commander expects from the platoon, but he cannot do it alone. He must properly utilize his NCOs, who are clearly critical in training the platoon. The scout platoon leader must get them involved in the planning and execution of training. NCOs know the individual abilities of the platoon's soldiers. They must ensure that all individual skills are trained to a "T."

FM 25-100 and FM 25-101 lead us to truly battle-focused training. The training program that we designed for the scout platoon took battle-focused training one step further. We used the same priority intelligence requirements (PIRs) that we found ourselves employing in tactical missions to help us further define those critical skills — for the scouts individually, the scout sections, and the platoon as a whole.

All reconnaissance efforts must be focused to a finite level. The scout platoon must look for those things that the commander must know in order for the task force to successfully accomplish its mission. These requirements come in the form of PIRs. They must be drafted by the task force commander (upon recommendation by the TF S2). They must crystallize the things the commander must know. If the task force leaders understand the com-

mander's intent, and know the PIRs, then they have multiplied their chances for success.

An example set of PIRs for a task force defense are:

- 1) Size, location, and disposition of enemy reconnaissance elements
- 2) Location of enemy's main effort
- 3) Enemy's use of NBC assets
- 4) Enemy's use of FASCAM mine-fields
- 5) Location of engineer elements in movement formation
- 6) Helicopter/air insertions of dismounted reconnaissance teams

In the TF attack, they might be:

- 1) Recon element OPs
- 2) Size, location, disposition of recon elements
- 3) AT element locations
- 4) Obstacle location and size
- 5) Location of combined arms reserve
- 6) Location of battle positions/enemy main effort

While the PIRs provide focus for the actual conduct of reconnaissance, they also provide for a training baseline — an essential task list, if you will. The scout platoon must train on those collective and individual skills that allow it to successfully gather the PIRs. These are the skills that we focused on as we developed the scout platoon training plan. These fundamental skills included physical conditioning, dismounted operations, land navigation, and employment of direct and indirect fires.

Scouts must be in outstanding physical condition. The key to a successful PT program is innovation. Use all available resources. Our plan included morning PT that concentrated on sit-ups and different variations of long distance runs on Monday, Wednesday, and Friday. Monday through Friday afternoons, except Thursday, training concluded with a trip to the gym for a one hour weight-training session, organized and supervised by section. On Tuesday mornings, we swam laps at the pool, because scouts should be good swimmers. On Thursday afternoons, organized athletics helped team building. To maintain growth, we set goals during counseling and measured progress with

an APFT every third Friday. Our PT program was the result of experimentation, and we continued to find new ways to make PT interesting and challenging.

The scout platoon must understand dismounted operations. Nothing is more effective than a dismounted scout. Although the HMMWV is a stealthy vehicle, it is still essential to get up close to confirm what you think you see from a distance, and to gather more detailed information. Training for this task must be realistic, at night when appropriate, with all equipment, over moderate distances, and with an OPFOR.

If a scout has a most important task, it is land navigation. Every member of the scout platoon, down to the junior man, must be an expert. Although some scout platoons possess SLGRs, and scouts must be trained on them, too, the majority of land navigation training should be without them. Assume worst-case scenarios in your training program. Remember Murphy's Law of Land Navigation — SLGRs will malfunction at the worst possible moment.

There are really two critical subtasks to scout land navigation. The first is knowing where you are, where you want to go, and how to get there. Junior leaders must be superior navigators. Leaders can train subordinates on this task by asking for frequent fixes during every training event. Training must be both mounted and dismounted. PLDC and EIB practice courses are excellent dismounted training



"The place to spend protected training time is in the field, with all assigned personnel and slice elements, to develop skills necessary to gather PIRs and develop a sound SOP..."



"Our PT program was the result of constant experimentation..."

Above, the platoon at the III Corps Cav Cup competition, which helped focus the unit's physical training program.



"Dissemination of PIRs is critical. Every member of the platoon must know what information the commander has deemed most important..."

devices and, on a larger scale, platoon-constructed mounted courses can be imaginative and challenging if constructed properly.

The second critical subtask is figuring out where the enemy is and what he looks like. Junior leaders must also be trained in IPB to enable them to select routes, danger areas, and likely enemy positions as part of land navigation training. Of course, the R&S plan will aid in this process, but the scout must not rely on this completely. Including junior leaders in the IPB planning process during protected training time field missions is a great way to build understanding.

A scout that can bring effective long range indirect fires on the enemy is an essential asset. Even the most junior scout must be able to call for indirect fire. Preliminary training in garrison can employ devices like the Observed Fire Trainer (OFT), but every opportunity must be seized to train with live rounds. Mortar live fire is an excellent opportunity, as is registration for TT XII and other live-fire exercises in which mortars fire. Field artillery opportunities, of course, are just as important, but harder to come by. Battalion- and brigade-size live-fire exercises enable scouts to hone their indirect fire skills with the big guns.

The scout platoon must also know how to use available direct-fire systems. Fundamentally, we must remember that, by design, the HMMWV scout platoon has a limited direct-fire capability. Its weapons are primarily for suppression and self-protection. Although still in its final draft form, FM 17-12-8 is a manual badly in need of revision. Like its tank gunnery counterpart, it should train the live-fire situations that are most likely to be encountered. Close-in, ambush, and reaction-type engagements to suppress an enemy more accurately represent what a HMMWV-mounted scout will encounter. A scout has no need to engage a moving flank truck at a range of 800m in the offense during daylight. Further, multiple engagements at stationary and moving vehicles at night in the offense at 400m and 600m with 50 rounds of M2HB ammunition really suggest a departure from reality, given the platform, weapon, and scout mission. Finally, section runs by four vehicles more closely resemble what a tank

platoon would do, not what a scout section maximizing stealth would do. In the meantime, battalion scout platoons should tailor their scout gunnery programs to reflect their most likely engagements, given their missions. Analysis during tactical play can serve as a basis for designing the gunnery program. Commanders and scout platoon leaders must do a reality check and train the platoon in what most effectively supports their unit's METL.

The make-up of the scout platoon is an important training consideration. The scout platoon can consist of more personnel than just the 19Ds assigned. In each section, we carried engineers from the battalion's engineer company slice to evaluate obstacles in detail and calculate breaching assets required. Their knowledge assisted the platoon in more exact reporting, and we learned from them some of the expertise that was engineer-specific. Since we seldom used demolitions, our engineers also taught us the techniques they used for breaching, and the entire platoon benefited from our habitual relationship. The key is habitual association — the same engineers all the time. Cross-fertilization of skills is smart training.

As an army, we must do better at equipping our scout platoons. Quite frankly, binoculars are the most sophisticated piece of equipment the scout platoon has today in quantities. The tools scouts need for the future are found in technology that already exists. Efforts must be made to expedite their acquisition. Specifically, the intravehicular information system (IVIS), integrated with a global positioning system (GPS), are extremely effective tools that enhance the scout's abilities to gather PIRs and transmit that information to the task force commander. Scouts need the capabilities of these information-sharing systems, already fielded in the M1A2. Also, the Long Range Advanced Scout Surveillance System, integrated with the GPS and digitally linked with the IVIS, complete the system that possesses the capabilities our scouts need on the battlefield. Increased acquisition, reporting, and navigational capabilities, combined with information-sharing systems, are needed to remain effective in the future as we digitize our Army. The costs of acquisition are far outweighed by the capabilities our scouts need now and will possess as a result.

The key element is that the task force commander must be personally involved in training the scout platoon. He must work directly with that scout platoon leader to ensure that the platoon leader clearly understands the necessary training focus dictated by PIRs, and that he has the resources to execute demanding, realistic training. The scout platoon leader must, in turn, be relentless in his approach to training the platoon. Our soldiers deserve top-notch training, and our mission success depends on it.

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Reconnaissance in the Offense

“COMMAND PUSH” vs. “RECON PULL”

by Captain Christopher D. Kolenda

One imperative during the planning process is the commander's description of what he wants each combat multiplier to accomplish; in other words, the commander's intent for fire support, engineer support, etc. Stated properly, this method helps each element employ its systems to their greatest effect in support of the scheme of maneuver. While doctrine states that this method should be used for each combat multiplier, we routinely fail to give this type of guidance to one of our most important assets — reconnaissance.

Commanders employ their combat multipliers in several ways. They use fire support assets to destroy, neutralize, or suppress. They use engineers to turn, fix, block, or disrupt the enemy or to prevent the enemy from doing the same. These methods maximize the effect of these systems on the enemy in support of the scheme of maneuver. Employment methods for reconnaissance, however, all too often remain ill-defined. As a result, our reconnaissance assets often do not deliver the intelligence necessary to either develop or support the scheme of maneuver.

There are two fundamental employment methodologies for reconnaissance: recon-pull and command-push.¹ These techniques are based on the German and Soviet models, respectively, and have given both armies a distinct advantage over those who inappropriately define the role of their reconnaissance assets. We, however, often use a method called recon-push. Recon-push is simply an effort designed to “get the scouts out early” in order to “identify all enemy in zone.” It is a quantitative approach to reconnaissance that normally uses a myriad of graphic control measures to ensure the scouts leave no stone unturned in a particular area or zone of operations. Recon-push is the Mission Training Plan approach to reconnaissance — a check-the-block method that lends itself to planning in a reconnaissance vacuum.

Here's how recon-push often works: Once a staff receives the mission, the S2 and/or S3 hastily work out a reconnaissance and surveillance plan, complete with graphic control measures to cover all of the key terrain and templated enemy locations. The scouts are told to “identify all enemy in zone.” As the scouts are covering their routes, Named Areas of Interest (NAIs), and checkpoints, the parallel planning process begins. The plan is developed, the order is issued, and detailed rehearsals begin prior to the results of the reconnaissance. Once the intelligence reports begin to come in, the S2 and S3 gather these reports, which may confirm or deny their template, then try to figure out how to overcome the enemy.

This process, typical of most units, seems logical, but it is a recipe for disaster. The initial breakdown occurs at the reconnaissance planning level. The problem stems, first of all, from the inability of the planners to decide or articulate what they want the scouts to accomplish and how this will contribute to the success of the mission. We try to overcome this deficiency by giving the scouts precise graphic control measures to guide their efforts and hope that this will pass for proper definition. We hope our deficiencies in guidance will be overcome if the scouts can identify all enemy in the zone, but this is rarely the case. The problem is generally one of two things:

- We do not know what we want our scouts to accomplish or do not know what they can accomplish.
- We know what we want them to accomplish, but what we want and what we are asking the scouts to do are two different things.

An analogy is useful in illustrating this problem. Traversing the battlefield is like moving through a forest. It is a medium of resistance. The forest contains many unknowns that are hidden beneath the canopy, several of which

may prevent us from reaching the other side. There are several ways of getting through, some of which are more hazardous than the others. Since we cannot adequately determine the best way to negotiate the forest from a map or aerial photograph, we must send a recon party to fill in our informational gaps so we can select the best route for the main body. What we should really want is a better picture of the forest and an appreciation of how we can get through it with the least amount of resistance along the way. Yet, what we often ask for is a detailed description of the trees rather than a better appraisal of the forest itself.

The recon-push approach to this problem would be to give the recon party a comprehensive list of checkpoints and routes and ask them to report in detail on all of these — and in the recon-push mentality we get just what we ask for. The recon party will report oak trees at one checkpoint, birch at another, and pine at a third. Road A may have some fallen trees in the path, road B a boulder, road C washes out in deep ravine but has a difficult bypass 50 meters to the south, and road D, which is not in the plan but a route the party happened to stumble onto, is somewhat treacherous but does move through the forest unimpeded.

What we know now is that part of the forest has oak trees, part of it has birch trees and another part has pine trees. We also know that each of the routes we chose has an obstruction that we must overcome in order to use the route, and that a route we did not consider will get us through the forest unimpeded. The common sense solution would be to choose route D, but this is not possible in recon-push.

The problem is that while the scouts were out gathering information, the planners had already chosen and rehearsed a plan and a scheme of maneuver to negotiate the forest. This is the

second breakdown. The results of the reconnaissance really do not matter as far as the plan is concerned at the macro-level. The information is used to determine what dangers the main body must overcome in order to execute the plan successfully. Some micro-level adjustments are made, but the overall plan remains intact. The obvious result is a lot of needlessly wasted time and energy along the way.

If we replace the simplistic forest scenario with the complex battlefield scenario, the problems associated with this mentality become very serious. By selecting recon-push, we fail to maximize the benefits of our reconnaissance. Instead of gaining an appreciation for the battlefield, we get a myriad of details that may not help us better comprehend the meaning of the entire picture. But the paradox of recon-push is that we really do not want this portrayal anyway, because we have already decided what to do. All we want to know is what we can expect to encounter along the way so we can line up our assets to deal with these problems. The foundation of the scheme of maneuver is not good planning; it is hope sprinkled with a little bit of luck. Ideally, we want to pit our strength against the enemy's weakness and force him to fight in a direction or manner for which he is unprepared. If we are lucky in using recon-push, our main effort will strike at a weakness in the enemy's defense. If we are not, we will pit strength versus strength with a dicey outcome. The recon-push technique virtually assures us of a strength-on-strength fight, because we have not worked intelligently enough to avoid it.

The recon-push mentality derives from our own inability to understand how to use our reconnaissance assets, and our failure to define coherently what we want our scouts to accomplish. The result? We plan in a reconnaissance vacuum. Instead of adopting a plan based on information and on an appraisal by the only element that knows the texture of the battlefield, we select a plan based on guesswork and the hope that we can overcome whatever gets in our way. The destructive impact of this has been demonstrated at the combat maneuver training centers and in simulation exercises where the OPFOR repeatedly runs rampant over BLUEFOR units.

A classic example of a strength-on-strength frontal assault that resulted

from our propensity to plan in a reconnaissance vacuum was realized in a recent simulation exercise conducted at Fort Hood. An armor-heavy brigade was given the mission to conduct a hasty attack against a defending enemy. The enemy was roughly battalion-size, and had set up a complex obstacle belt to support their defense. The brigade had developed a plan to create three breach lanes through the obstacle belt and then conduct a frontal attack against the enemy battalion. A reconnaissance unit was OPCON to the brigade to create the breach lanes.

During the zone reconnaissance, the scouts reported that the obstacle belt was approximately 30 kilometers wide and 10 kilometers deep. They had also identified a three-kilometer-wide gap in the obstacle belt along the western boundary. The scouts reconned the gap, and reported that the gap was clear. A battalion could pass through it in roughly 15 minutes. Furthermore, there was no enemy unit overwatching the gap. The brigade could easily use this route to attack the enemy in the flank and rear and avoid plunging headlong into the enemy's main defense. Instead of using this gap to bypass the obstacle belt and quickly defeat the enemy, the brigade insisted on adhering to the original plan. Three to four hours later the brigade finally pushed through the obstacle belt, attacked into the enemy's strength, and suffered considerable attrition.

This is an example of the paralysis we create through the improper use of reconnaissance in the offense. First of all, the brigade developed the plan in an intelligence vacuum, despite having enough time to send the recon unit forward to gain information. Second, the reconnaissance unit had identified a gap in the enemy's defense early in the mission, but the higher unit failed to adapt their scheme of maneuver to the enemy situation. The result was needless attrition and lost momentum, instead of a quick, decisive victory through an open flank.

The concept of surfaces and gaps that I alluded to earlier is a fundamental building block of warfare at the tactical, operational, and strategic levels. Surfaces are areas where the enemy is strong; gaps are where he is weak. Since the enemy cannot be strong everywhere, he must be weak (or weaker) somewhere. Our job is to discover or create an enemy vulnerability and ex-

plot this weakness to our advantage. What we are interested in is not a fair fight, in which we pit our strength against his, but an unfair fight, in which we employ our strength against his weakness. When we attack an enemy weakness with overwhelming strength, the result is a quick, decisive victory. Yet, in order to do this we must know exactly where these surfaces and gaps are. Reconnaissance, when used in its proper role, is the most important factor in gaining this portrayal of the battlefield. The identification of the enemy's strengths and weaknesses must be the guiding principle behind our reconnaissance effort. This is more than just identifying all enemy in zone. It is a textured picture of the battlefield that gives us an appreciation of where the enemy is most vulnerable and how best to exploit this weakness. In this way it becomes the cornerstone of our tactical plan. Recon-pull and command-push reconnaissance are two methods that will enable us to gain these results.

Recon-pull reconnaissance is derived from what the Germans call *Auftragstaktik*. Literally translated, it means mission tactics. The concept behind *Auftragstaktik* is directive control in which the subordinates are given a specific mission, but are allowed great latitude in deciding how to accomplish it. The binding principle behind *Auftragstaktik* is the commander's intent — what the commander wants to accomplish by conducting a certain mission. The commander's intent, as William S. Lind puts it, is the glue that holds the operation together.¹ This concept leaves the initiative with subordinates so they can create and exploit opportunities as they present themselves on the battlefield. Their only constraint is that their actions must support the commander's intent.

In a classic employment of recon-pull, the commander would use reconnaissance or forward elements to move along different routes or axes toward the enemy. The forward elements (scouts, cavalry troop, advanced guard company) are the "reconnaissance screen." Their mission is to identify the surfaces and gaps in the enemy's defense. Once this gap is found, the commander will exploit the opportunity by sending the main body to attack this vulnerability and penetrate into the gap. The main body can then commit forces to widen the gap and envelop the enemy from the rear. The forward ele-

ment continues to move, seeking paths of least resistance, and pulling the main body deep into the enemy's rear. The key is to avoid the places where the enemy is strong and find a lightly or undefended gap that leads to the enemy's rear. In doing so, the commander pits his strength against the enemy's weakness with considerable advantage, rather than rushing headlong into the teeth of the enemy's defense.²

In a nutshell, the reconnaissance element pulls the main body toward the enemy weakness. The main body crushes the enemy at this point, pours through the gap, then continues deeper to destroy the enemy's fire support assets, or attacks the enemy's assailable flank or rear. In either case, the surface the enemy has built becomes insignificant. This part of the enemy's defense is either bypassed, isolated, or forced to fight in a manner or direction that it is not accustomed to or prepared for. The result is an unfair fight in which we have a decided advantage.

Recon-pull tactics could have been used very effectively in the above simulation exercise. The reconnaissance unit could have "pulled" the brigade through the gap in the enemy's defense, thereby rendering the obstacle belt insignificant and forcing the enemy to fight in an unexpected direction. The logical outcome would have been a quick, decisive victory in a matter of minutes rather than a slow, indecisive, and attrition-laden frontal assault against the enemy's strength. The former approach cuts through the enemy's defense like a sharp knife, the latter is akin to performing surgery with a blunt instrument — dull and painful, lots of tissue damage, and with a much lower chance of success.

The use of recon-pull, however, is not a panacea. Recon-pull relies on directive control, mission orders, and "trust tactics." It emphasizes the ability to read a situation rapidly, identify a weakness, and exploit it. As a result, it requires extensive training in reconnaissance, enemy doctrine, and rapid, agile battle drills to be effective. Since it stresses the primacy of opportunity, recon-pull requires a great deal of trust between senior and subordinate commanders, and a clear commander's intent and main effort to unify the action. Given the nature of the training required to attain the level of battlefield insight necessary to recognize and exploit opportunity, and the level of trust

a senior must place in the decisions of his subordinate commander, we cannot just wake up one day and decide to use recon-pull tactics. We must create a culture within our units that trains, reinforces, and rewards the confident, independent, yet properly-focused atmosphere and unity required to make this a reality. This cannot be accomplished overnight. It requires a deliberate commitment on the part of the senior commander to train and empower his subordinate leaders to make the rapid, accurate decisions necessary to recognize and exploit opportunity.

"How does the OPFOR do it? First of all, their reconnaissance units and intelligence officers are trained to look for enemy strengths and weaknesses. They do not send their scouts out merely to check a block on the MTP...."

Skeptics will argue that these decisions are too important to be left in the hands of subordinate leaders. I would argue that they are too important not to be. The side with the fastest decision-cycle wins. Sound decisions made at the lower level are implemented faster than the same decisions made at a higher level because of the nature of communication. The question thus becomes not whether our subordinates should make these choices, but what have we done to train them to make these decisions. Training our subordinates *how* to think rather than *what* to think, and evaluating the decision-making process as well as the decision itself, are important steps in this direction.

Recon-pull is most appropriate in a fluid situation where the enemy situation is unclear, or is rapidly changing. However, if we are given sufficient planning time against a relatively static enemy force, a different approach might be more suitable, "command push." This type of reconnaissance is built on the Soviet model which uses detailed instead of directive control. This is also the model used by the OPFOR at the Combat Maneuver Training Centers. The purpose of command-push reconnaissance, like recon-pull, is to identify enemy strengths and weaknesses, or surfaces and gaps, and report them to the commander, who then designs a detailed plan to mass his strength against the enemy weakness.

This approach differs from recon-push because the plan is selected on the basis of the reconnaissance results, not regardless of them. Often, the commander designs several different courses of action and develops them in as much detail as possible prior to the results of the reconnaissance. Once the recon units have painted the picture of the battlefield, the commander selects a plan based on this information and refines it in sufficient detail to give his unit the greatest possibility of success. This precise plan emphasizes unity of effort at the expense of opportunity, since the enemy situation is known in enough detail to allow for rigorous, centralized planning.

This method of reconnaissance is also very effective. Fifty-five battles were studied at the National Training Center to determine the impact of reconnaissance in the offense. In 50 of these battles, the OPFOR reconnaissance was successful in identifying 85-90 percent of the BLUEFOR's vehicle positions. The OPFOR won 45 of these battles.

How does the OPFOR do it? First of all, their reconnaissance units and intelligence officers are trained to look for enemy strengths and weaknesses. They do not send their scouts out merely to check a block on the MTP. They aggressively locate enemy positions, identify potential strengths and weaknesses, then report those detailed findings. The commander then selects his plan and scheme of maneuver based on the enemy template developed by the division recon and confirmed by the regimental recon. The OPFOR accepts risk in planning time, but overcomes this through detailed rehearsals on formations, movement techniques, and actions on contact drills. This method allows the OPFOR commander to mass his strength against the BLUEFOR's weakness. The result is a 90 percent success rate.

Both methods of reconnaissance are extremely effective and can be used by themselves, or in combination when the battlefield transitions from a static to a fluid nature. Recon-pull emphasizes opportunity over detailed control, and relies upon the commander's intent and designation of the main effort in order to achieve unity. Command-push, on the other hand, stresses early determination of enemy strengths and weaknesses, and a detailed plan to overwhelm the weakness over the exploitation of opportunity.

The key to a successful reconnaissance effort is the identification of enemy surfaces and gaps, for this allows the commander to mass his strength against an enemy weakness. The commander's intent for reconnaissance, therefore, must have the identification of enemy strengths and weaknesses as its foundation, and our reconnaissance collectors and assessors must be trained to recognize these. The efforts of the collectors (the scouts) and the assessors (the S2) must be mutually supporting and complement one another.

One of the great travesties of our system is the perpetuation of the "tell me what you see and not what you think" syndrome. This mentality assumes a minimum level of competence on the part of the scouts and a maximum level of omniscience on the part of the S2. Indeed, it often seems as though we treat the S2 as the guardian of some bastion of doctrinal and interpretive truth that no one is allowed to enter. This penchant robs us of the valuable analysis that the only element with eyes on the battlefield can offer. It also places the S2 in an unfair position.

I had the opportunity to witness an unfortunate manifestation of this syndrome while observing a unit at a combat training center. This particular unit was planning an offensive mission and had sent the scouts on a zone recon up to a designated phase-line. The unit had assumed incorrectly that it would encounter a moving enemy force the next morning and had based their plan accordingly. Meanwhile, during the zone reconnaissance, the scouts encountered an obstacle belt that was overwatched by two enemy vehicles with a considerable amount of artillery at their disposal. The scouts did their duty and reported exactly what they saw and nothing else. The next morning, air scouts preceded the ground scouts as the forward element, and the unit began moving toward its objective. One air scout had gotten himself into an excellent position and observed roughly five vehicles moving into defensive positions. He also reported exactly what he saw — five vehicles moving. The report was incomplete because the scout failed to report that the vehicles were moving into a defensive position, but even if he had, the results would not have been much different. The command group — S2, S3, and commander included — were firmly wedded to the idea that they were facing a moving

enemy force, and pushed the unit to move quickly to gain a piece of defensible terrain. The reality was much different. The enemy was stationary and had occupied a hasty defensive position. The unfortunate unit was quickly decimated before realizing what it was up against.

The S2 was the scapegoat for the defeat because he failed to interpret the enemy situation properly, but there was plenty of blame for everyone. The obstacle belt and the overwatching observation post should have been a tell-tale sign that the scouts had entered the enemy security zone. This should have been the first indication that the enemy was in a defensive rather than an offensive posture. The five moving enemy vehicles were the enemy's reserve that had taken up position to reinforce the defense. Nevertheless, this entire situation could have been avoided if the scouts were trained and trusted to analyze what they had seen. We need to arrive at some level within the reconnaissance effort where analysis from the forward scouts and S2 is synergized. The appropriate level for this is the scout platoon leader. He should be trained to do the S2's job just as well as the S2 himself. In this way, there is an analytical dialog between the front and the command post based on knowledge and trust. The result will be a more precise and robust depiction of the battlefield.

Thus far I have discussed some of the fundamental problems associated with our reconnaissance efforts. The first of which is the inability to define and/or articulate what we really want the scouts to accomplish, resulting in a misalignment between expectations and instructions, coupled with tactical planning in an information vacuum. The second is the lack of training and/or trust we place in our scouts, which results in an incomplete or erroneous depiction of the battlefield. I have offered solutions to both of these problems. I have also laid out the theoretical conceptions behind recon-pull and command-push reconnaissance and examples in which they were either used or could have been used to improve the success of a tactical plan. I will now offer a technique which I have found to be effective against a static enemy defense: layered reconnaissance.

The initial reconnaissance element moves out with the task of identifying enemy strengths and weaknesses

through a detailed reconnaissance of enemy positions. This may be accomplished through the use of ground, air and electronic reconnaissance. Their purpose is to develop the enemy template to enable the commander to decide which axis he will use and determine the focal point of his attack. In the meantime, the units can conduct rehearsals on movement formations and techniques, actions on contact, and breach drills. Once the template is developed, a second reconnaissance element (platoon-sized) confirm this template. That element should then be in a position to bring artillery fires at the point of attack, and use smoke to isolate that enemy element from the rest of the defense. Once the template is confirmed, the scheme of maneuver is locked in.

The last reconnaissance element is the advanced guard (company-sized). Its purpose is to establish the conditions for the attack of the main body by creating a gap in the enemy's defense at the weak point and pulling the main body through the gap in the defense. The main body can then continue to a deeper objective, or attack the defending enemy from the flank or rear and widen the gap for the follow-on force.

This technique may sound suspiciously similar to the tactics employed by the OPFOR at the National Training Center, but it is consistent with our doctrine. The only difference is in the use of reconnaissance to accomplish one specific task — identify the surfaces and gaps in the enemy's defense — which enables us to pit our strength against an enemy weakness. Another difference may be the commitment of an infantry platoon as a second layer in the reconnaissance effort. While this detracts from the raw combat power of the main body, it becomes an important combat multiplier in confirming the enemy's weak point and bringing other combat multipliers to bear at the focal point of the attack. If we can achieve these reconnaissance results, our success rate will increase several-fold, and enable us to gain a greater local superiority at the decisive point.

Reconnaissance is a critical, but often misused, combat multiplier. Recon-pull and command-push reconnaissance are two methods that support their parent form of tactics, and have been used effectively by both German and Soviet-style forces. The most critical task in the reconnaissance effort is the identifi-

LETTERS

(Continued from Page 4)

In conclusion, I say to my critics: Lighten up! The world will not end because the readers of *ARMOR* Magazine have had an opportunity to read something about EGT that you don't want them to see. The readers of *ARMOR* Magazine are smart enough to form their own judgments.

Additionally, I would like to retrospectively add two references to my article. Unfortunately, the references were rediscovered too late to be included in the article. The references are:

(1) Eshel, Lt. Col. David, IDF (Ret.), "Battlefield Survival," *NATIONAL DEFENSE Magazine*, September 1989. In this article, Col. Eshel makes some cogent points about vision and survivability. Here is an excerpt:

"...One of the foremost problems in tank fighting has always been to detect the enemy before he had a chance to fire for effect. Even the most sophisticated fire control equipment cannot replace the trained and experienced human eye in its surveillance and detection activities. ... detecting enemy targets is easier said than done. To... identify an enemy tank at maximum range is like trying to pinpoint a small mosquito on the far wall of a long room. ... Quick reaction to target acquisition is the key to survival, and any impediment in

achieving first hit may be fatal." Lt. Col. Eshel is also a past contributor to *ARMOR*.

(2) Mergens, Maj. Michael and Capt. William Weldon, U.S. Army. "Now Where Do We Put It?" *ARMOR*, Nov-Dec 1994. This is three pages of good discussion on the stowage limitations in and on armored vehicles.

DON LOUGHLIN
Bellingham, Wash.

Author Seeks Accounts Of War from the Turret

Dear Sir:

I'm a former member of the British Army's Royal Hussars and have been commissioned to write a book entitled "Voices from the Turret: Eighty Years of Allied Tank Warfare, 1916-1996." The idea is to have a definitive account of tank warfare as told by those who were in the turret. I am seeking first-hand accounts from Americans who served in tank combat in World War I, World War II, Korea, Vietnam, or the Gulf War. Accounts can cover all activities of service in combat tank units.

A final manuscript is to be submitted in January 1997, with publication scheduled

that fall. Interested individuals should contact me at the following address:

MR. RODERICK DE NORMANN
Tinkerfield House, Monument Hill
Stert, Devides
Wilts SN10 3HU
England

Armored SUSV Available If Requirements Exist

Dear Sir:

I read with interest the *ARMOR*, May-June 1996 article, "Bosnia Report," on the use of the M973A1 Small Unit Vehicle. The SUSV was one of the Army's first successes through the Foreign Comparative Testing Program in the early 1980s. Approximately 1,080 SUSVs have entered the Army inventory since the vehicle was Type Classified in March 1983. The FCT Program was created by Congress in 1977 to entice the services to consider allied equipment versus service-unique RDT&E programs. The goal of the program is to evaluate allied equipment towards the goal of fielding. Major successes include the Fox NBC Recon Vehicle and M1 chassis-based Heavy Assault Bridge. If a requirement for

RECONNAISSANCE (Cont'd)

cation of enemy strengths and weaknesses, and using these reconnaissance results to match our strength against the enemy weakness. If done effectively, the result is an unfair fight to our advantage where we can achieve a quick, decisive victory.

Notes

¹For a detailed discussion of these methodologies from a theoretical standpoint see Robert Leonhard, *The Art of Maneuver: Maneuver Warfare Theory and AirLand Battle*, Novato, Calif: Presidio Press, 1991, pp. 113-118. Leonhard's discussion centers on *Auftragstaktik* and *Befehlstaktik* as command and control methodologies, but he also relates them to how reconnaissance is used within these conceptual frameworks. See also William S. Lind, *Maneuver Warfare Handbook*, Boulder: Westview Press, 1985, pp. 18-19.

²See also Leonhard, pp. 113-114, and Lind, pp. 18-19.

Captain Christopher Kolenda is a 1987 graduate of the U.S. Military Academy. His previous assignments include tank platoon leader (M Co) and scout platoon leader and XO (L Trp) 3/11 ACR; U.S. Boeselager Team, Sep 89-Jun 90; and motor officer, 1-7 Cav and commander, A Trp, 1-7 Cav, 1st Cavalry Division. A graduate of Armor Officer Basic Course, Armor Officer Advanced Course (Distinguished Honor Graduate), BMOC, CAS³, and Air Assault, Airborne, and Ranger Courses, he is currently a graduate student, Modern European History, University of Wisconsin-Madison, enroute to Department of History, USMA.

DRIVER'S SEAT

(Continued from Page 6)

Recently the gauntlet was passed in several key positions on Fort Knox. CSM Kevin P. Garvey assumed the duty of Commandant at the Fort Knox Noncommissioned Officer Academy on 21 March 1996, and CSM Gerald D. Utterback assumed the duty of Armor School Sergeant Major on 23 March 1996. They are working diligently to ensure the success of the BNCOC consolidation and further the education of armor soldiers.

Fort Knox has the capabilities and the technology to train all the armor soldiers necessary for the force of today and that of tomorrow. It is with great pride and commitment Fort Knox accepts the responsibility and will endeavor to produce the most effective and well trained armor soldiers this nation and the world has ever seen.

1995 Index Available

The 1995 *ARMOR* Index is now available. For your copy, contact Mary Hager at DSN 464-2610/2249, commercial (502) 624-2610/2249; e-mail: HAGERM@KNOX-EMH1.ARMY.MIL; or write *ARMOR*, ATTN: ATZK-TDM, Ft. Knox, KY 40121-5210.

the BV-206S armored version of the SUSV does emerge, the IME Division can provide assistance in obtaining RDT&E funds. *ARMOR* readers are encouraged to contact our office for further information: International Materiel Evaluation Division, phone: (410) 278-1369.

TOM BUONAUGURIO
Project Officer
HQ, Army Materiel Command

Mine Plow Tank Useful in Restricted Terrain

Dear Sir:

I would like to commend SSG Krivitsky for, although indirectly, bringing to light a valid point which I had stressed during my years within the Armor community, "The Three to Six Second Advantage: Tank Combat in Restricted Terrain," (*ARMOR*, Mar-Apr 96). Although I believe that anticipating enemy attacks/ambushes involves more than having, "...your weapon drawn... accurately aimed and armed," the information provided was outstanding. The author's comments on 'recon by fire,' (The Crew's Critical Tasks para. 8, and Recon by Fire) were right on the money.

I thoroughly believe that routing the enemy with the use of the most unappreciated weapon system on board, the loader's M240 MG, has been for too long overlooked. Areas suspected, and capable, of concealing enemy positions should be saturated with fire, utilizing the loader's weapon system when applicable.

To effectively 'fight the tank,' a crew must be allowed and encouraged to use all of

the tank's available weapon systems. Training crews, especially the loader, to attack, suppress, and destroy targets utilizing the correct weapon system in its respective role against its appropriate targets, is absolutely essential.

In addition, I believe that when moving in such an environment as described in the author's article, a tank equipped with a mine plow should be placed in the lead position. The advantages to this are numerous, as well as common sense. Besides the obvious advantage of having a mine plow available in a defile road with little or no bypass area, the convoy's survivability would be increased. The added protection afforded by the mine plow to absorb the impact of head-on and frontal oblique ATGMs and ATMs, would be substantial.

Also, the plow maintains the ability to prematurely detect and destroy antitank mines and disassemble obstacles. Another advantage would be 'bunker busting.' The ability to 'charge' a bunker and utilize the plow as a means of destruction, although risky, should not be overlooked.

The M1's mine plow is like having an engineer detachment on the front slope of the tank. Its role in combat operations should not be limited to that of clearing a 'swath' or paths for follow-on vehicles.

I would like to point out what I believe may be a weak point in the author's plan. When operating in such an environment,

no task force should be deployed without infantry support. In such a situation as presented in the author's article, infantry support would grant an outstanding, as well as critical, scout advantage.

To drastically improve the task force's chance of survival (the bottom line here), crosstalk between armor and our attached infantry assets, both before and during the mission, would obviously be advantageous. These infantry units and their elements could best detect possible enemy AT and FO positions.

Also, let us not forget the M2's role in tank destroying, as well as quickly delivering infantry support. By utilizing bounding overwatches, coupled with already existing combined arms concepts, the combat strength and power of the task force drastically increases.

"Train as you fight" should be more than a catch phrase for professionals. It is imperative that we train our soldiers without mercy, teaching them the secrets of our trade, making them tomorrow's professional tankers. At the same time, we should be receptive to new and unorthodox ideas and suggestions. A new genre of soldiers means fresh and unburdened ideas and points of view. Let's listen to them.

JODEY C. KING
Frederick, Md.

Comments on the (Draft) Brigade MTP

ARTEP 71-3 MTP (Initial Draft) Mission Training Plan for the Heavy Brigade Command Group and Staff is currently under revision at the Armor Center. The Armor Center shares proponentcy with the Infantry School for this manual, but has primary writing responsibility. We are looking for specific comments on the content of the MTP. During the revision we added some new tasks:

- Employment of MI assets
- Planning of R&S
- HHC commander and CP-related tasks
- Deployment-related tasks
- Protection tasks
- MP tasks

Copies of the *ARTEP 71-3 MTP (Initial Draft)* were sent out to all divisions and brigades, branch schools, and CTCs.

In an effort to make our doctrine as accessible as possible to the force, we have placed the MTP on the Armor Center's Home Page on the Internet. Look at the Fort Knox Doctrine home page with the following URL (address):

<http://www.awwg.org/~dave/doctrine/71-3-mtp/brigmtmp.htm>

Your comments can be sent by e-mail/PROFS or mailed to this headquarters. Please include the name and telephone number of your POC with the comments.

The mailing address is:

Director, DTDD
ATTN: ATZK-TDD-B
U.S. Army Armor School
Fort Knox, KY 40121-5000

The e-mail address is:

riggsw@knox-emh1.army.mil

The PROFS ID is RIGGSW at KNO1.

For further information, call CPT Riggs at DSN 464-6651 or commercial (502) 624-6651.

BOOK ESSAY

He Rode Up Front For Patton by Brig. Gen. Albin F. (Al) Irzyk, Pentland Press, Inc., Raleigh, N.C., 1996. 388 pages. \$32.95.

There is a tantalizing, final glimpse of horse cavalry operations that opens this account of transition and employment of armor during WWII. Cavalry is fast, able to get around the enemy, but has no firepower. Animals die, even in training. Armor will change that.

The author's perspective encompasses this change, because he starts his career as a new horse cavalry lieutenant in 1941, and by the end of the war in Europe, he is a lieutenant colonel and an experienced commander of the fully mechanized 8th Tank Battalion, 4th Armored Division.

It is the frequent assignment of the 8th, "The Rolling Eight-Ball," to be in the lead of Patton's 3rd Army, which is the focus of the book.

The author is a fighting commander who is twice wounded, and who knows tank operations not only from the platoon, company, and battalion level, but also from the perspective of combat command (in the 4th AD, the 8th functions most often as part of Combat Command B).

The action in Europe falls essentially into three sections: heavy fighting with rapid progress across France punctuated by enforced breaks, the relief of Bastogne, and entry into Germany and victory.

The 8th and the author are not only part of some of the best-known battles of the war, but also many others of great importance which have received less attention. First-hand experiences include fighting out of hedgerow country, backtracking and fighting at Lorient, and covering an amazing 328 combat miles across France in 12 days to be within 63 miles of Germany by September 1, 1944. The author is in command of an advance guard that establishes the first bridgehead across the Moselle on September 11.

While much has been written about the encirclement of Nancy, the Arracourt tank battles and the great success of CCA, the author expands the record by describing his combat experiences in heavy fighting in CCB at Fresnes en Saulnois, the other half of the encirclement that made success possible (CCB knocks out 23 German Panther and Tiger tanks). In spite of inflicting staggering losses on the Germans, for a second time supplies are diverted, the 4th AD is stopped for a full month.

The author has been a major and battalion S3, but he regularly commands an advance guard. In December, at the age of 27, he is given command of the entire 8th Tank Battalion, one of three in the 4th; the other two are commanded by his counterparts, LTC Creighton Abrams, and LTC Delk Oden.

His first combat after receiving command is at Singling, a situation he inherits, and he describes what he did to resolve it, and in an after-action summary analyzes its relative importance.

These highly useful summaries are included at key points, and are based on the author's thoughts and knowledge at the time. They are often combined with straightforward appraisals of the decisions of those with whom he serves, including the well-known, such as then-LTC Creighton Abrams, COL Bruce Clarke, Generals Wood, Gaffey, and Patton, as well as company commanders, platoon leaders, and platoon sergeants.

Appraisals are based not just on personal impression, but are supported by descriptions of what went right and what went wrong. They are there for you to agree with or not, and regardless, they are fascinating reading.

The 8th is in the front of Patton's 3rd Army to relieve Bastogne (161 miles in 22 hours), and makes the initial contact with the 101st. The absorbing analysis of the commitment and recall of Task Force Ezell highlights the interplay of decisions among General Holmes Dager (CCB Commander), General Omar Bradley, and General Patton, decisions which could have both lost the entire CCB, yet ultimately saves TF Ezell.

The author is wounded at Chaumont when his tank is hit, but he takes the town on December 25th. On December 26th, CCR with the 37th and 53rd, break through to the 101st, and on the following day, the 8th links up with the 101st. In January 1945, the author is promoted to lieutenant colonel.

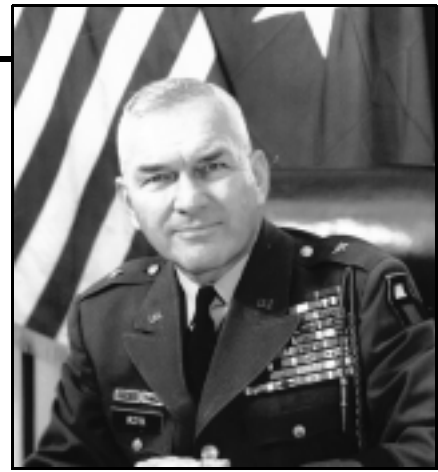
In Germany, the author is wounded again in taking St. Johann, when he leads an attack and his tank is hit by a panzerfaust, but he continues the fight which ultimately succeeds. He was awarded the Distinguished Service Cross.

With the 8th in the lead, the 4th AD crosses the Rhine on March 24, 1945. In addition to its many combat experiences, the 8th liberates North Stalag III concentration camp. The author is division chief of staff when the 4th is deactivated in the spring of 1946.

In addition to crediting his troops and their training for the accomplishments of the 8th, the author cites mission-type orders instituted in the 4th AD by MG John S. "P" Wood, and supported by CCB commander BG Holmes Dager. Regularly, when the author is given a job to do, he makes the implementation decisions himself.

The above is only a brief outline, for on rough count I come up with descriptions of nearly 40 engagements with the enemy in this book, including the author's growing "battle sense" and outstanding employment of armor at Marthille, and his insightful use of artillery in taking Voellerdingen and the bridge over the Eichel (with which he is credited by General Patton in his personal war diaries), all bonded together with descriptions of what life was like for soldiers in the field.

Additionally included are the author's evaluation of weapons, both U.S. and enemy, based on his being on the firing and receiving end: the M5, M4, M4A3E8 tanks, the German Panther and Tiger tanks, the Panzerfaust, and the 88. While German tanks had higher velocity guns, the 360-de-



BG Albin F. Irzyk in April 1970.

gree power traverse of the Sherman turret allowed U.S. gunners to get off more accurate shots faster. The Sherman could travel great distances, and its simplicity made it possible to perform major repairs in the field.

The only illustrations are maps, some of which are dark and hard to see, but the path of movement is clear. For me, the most valuable part of the maps were the contour lines, which give a good idea of the terrain involved.

The book does not suffer from lack of other illustrations. Still, a few would have been useful, such as photos of the M3 (Stuart) in which the author starts his training, the M5, which he uses a lot in Europe, and the M4 Sherman, which would graphically show the evolution of armor that occurs in a short time.

While this is the story of the 8th from the author's vantage point, he writes in the third person which is a little disconcerting at first. However, in a short time this becomes quite comfortable for the reader.

Quite simply, I found this is to be an outstanding book, both in terms of content and the absorbing writing style of the author. General Irzyk knows how to tell a story, and there is an immediacy and freshness to the narrative that makes you feel as if the action happened recently (for an example, see his account of several meetings with Patton in "Patton Revisited," *ARMOR*, March-April 1995, which are also found in this book). The tempo stays up, and more than once I found myself awake at 3:00-4:00 in the morning, reading to find out what happens next.

As time grows between the present and WWII, the value of this book will increase because it is a first-hand account of major combat action from a soldier's point of view. It is not retrospective after many decades, but rather based on his experiences as they happened to him, and General Irzyk is eminently successful in conveying this.

PAUL S. MEYER
Cincinnati, Ohio

(Mr. Meyer is a former USAARMS Information Officer and Armor School Historian.-Ed.)

BOOKS

Postwar Spies: "A Rollicking Good Yarn..."

Soldiers, Spies, and the Rat Line: America's Undeclared War Against the Soviets by Colonel James U. Milano, USA (Ret.) and Patrick Brogan, Brassey's, 1995. 227 pages. \$23.95.

The shooting's over, a tenuous peace is starting, and an ostensible ally is making threatening overtures. You're assigned to find out what's really going on, and you start with a few defectors from that "ally." When you've gleaned everything from them, you need to find a safe place for them. You can't send them back, you can't send them to the U.S., and you can't hide them in Austria where the KGB would soon find them. You and your inventive staff create a very unorthodox escape route, a "rat line," to South America. And it works. Oh man, does it work!

This is the story of the 7769th Military Intelligence Service Battalion and its commander, Major Jim Milano, from Salerno of WWII to 1949. It had 180 officers and 150 enlisted men, nearly all linguists, and most university graduates. They were smart, hard working, and innovative. And, like the characters in TV's "M.A.S.H.," they were a pretty route-step outfit. Milano ran his unit like a big brother, father confessor, and easy-going boss, all rolled into one. It worked, probably because he was a fine gauge of his troops. Later Milano became the chief of the Operations Branch of the Intelligence Directorate for Austria, but his *modus operandi* never changed.

Milano was assigned a number of standard intelligence functions to perform, but, as the uneasy peace settled over Austria, more specific assignments appeared. There weren't many rules to follow on how to get the information, so the 7769th made its own, along the standard of "get the data first and sort out the rules later." The result was great intelligence collection in an often rowdy and hilarious masquerade. There were some wild and woolly adventures of dubious legality, scary clandestine operations with heart-stopping timing, and frequently unorthodox and questionable decisions. (Years later, General Abrams once told me to be careful about asking permission to do something if a "No" would bother me. Milano adhered to a similar dictum.)

This book is anecdotal in form, like Eisenhower's "Stories I Tell To Friends," with most chapters dealing with a specific incident or problem and some intervening

chapters to set the stage. In the turbulent arena of post-war Austria, Milano and his dedicated but sometimes unscrupulous staff worked with spies, refugees, thieves, and heroes. He tells of the Vatican priest who sold phony visas, Russian defectors who wandered into a bar and started a riot, his bribing a police supervisor with a stolen jeep to retrieve some counterfeit documents, the beautiful Nazi who convinced her Russian lover to defect, and the American general who tried to break into a Russian hospital to rescue a friend's mistress!

This is a rollicking good yarn. It's funny, bawdy, exciting, very entertaining, constantly amazing, and almost unbelievable. But it's true! It tells us how some intelligence operations functioned in the unsettled and makeshift post-war period when smart, young soldiers, under great pressure to deliver essential data, found their way around the most formidable obstacles (which, in Milano's thinking, included the State Department!). It's a fine example of American determination, ingenuity, and humor. And it's great reading!

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Five Years a Cavalymen, Or Sketches of Regular Army Life on the Texas Frontier, 1866-1871 by H.H. McConnell, University of Oklahoma Press, Norman, Okla., 1996. 311 pages. \$12.95 (paperback).

The disparity of numbers of soldiers involved was not the only reason that there were hundreds of memoirs written by Civil War participants and only a few by frontier veterans of the Indian Wars. The Regular Army soldiers of the Indian Wars were often illiterate, and few kept any form of diary. Most written material from that phase of American military history has come to us through the writings of a few officers and the wives of officers. Thus, this book by an articulate and perceptive Regular Army enlisted man is unique.

First published in 1889, *Five Years a Cavalymen* is an accurate portrayal of life in the ranks of the Sixth Cavalry on the West Texas frontier following the Civil War. Stationed for five years at Fort Belknap and Fort Richardson, typical frontier posts of

the time, McConnell presents the unglorified story of the officers and his fellow enlisted men in unvarnished, but articulate, terms. He reports on the heavy drinking, the boredom, and the general lack of organization of frontier military life. On the other hand, he demonstrates an appreciation for the environment, an appreciation that led to his settling down in the area when his military service was completed.

Clearly, McConnell was unique. A veteran of three years of Union service in the Civil War, he enlisted in the cavalry following the war. We follow him through training at Carlisle Barracks, on a sea voyage to Texas, and by military convoy to the Texas frontier to join the Sixth Cavalry. He was obviously a soldier of talent, as before long he had been promoted to company first sergeant, a position of much prestige and power. He was an astute observer of human behavior and provides insights into the personalities of the officers and enlisted men who made up the post-Civil War Regular Army.

Any reader seeking the excitement of frequent clashes between the cavalry and the hostiles will be disappointed, for the book is not a recounting of war stories. In fact, it is clear that Sixth Cavalry experiences with the Indians were largely ones of learning of Indian depredations against settlers and then sending out patrols that would return empty-handed. Either McConnell seldom participated in such actions or found them dull compared to daily observances of the environment and his fellow soldiers.

Nevertheless, the book earned a reprinting, largely because it is so unusual to have a witty, well-written recounting of the frontier experience by an interested and intelligent observer from among the ranks.

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Mao's Military Romanticism: China and the Korean War, 1950-1953 by Shu Guang Zhang, University Press of Kansas, 1995. 338 pages. \$45.00.

Viewing war from the enemy side is always a difficult task and, in the case of war with a closed communist nation, nearly impossible. Shu Guang Zhang, an associate professor of history at the University of Maryland, offers the western reader per-

haps the first comprehensive view of Chinese strategy-making during the Korean War. Mao's *Military Romanticism* tackles a difficult issue in military theory — the decisiveness of men over machines in war — and succeeds in painting Mao as a romantic who believed that victory did not necessarily go to the technologically-advanced force. Mao used Chinese combat successes in the Korean War as an opportunity to expand and consolidate his political power at home, while uniting the Chinese people against U.S. "imperialism." While science continues to march, there will always be battlefields where combat resembles a "knife fight in a phone booth." *Mao's Military Romanticism* deserves a place on the military professional's bookshelf as a precautionary tale to any force that relies mainly on technology for its fighting power.

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Tiger Without A Home: The United States Army Ordnance Museum's Panzerkampfwagen VI, Ausführung H1 by Richard Cox, U.S. Army Ordnance Museum Foundation, Inc., Aberdeen Proving Ground, Md. 86 pages, \$12.95 (softcover).

If you're into armored vehicle military modeling, this book will give you a wealth of visual and written detail of a Tiger I that fought in the North African Campaign. If you want a great example of meticulous research into vehicle identity, keep this on a shelf. Mr. Cox, a charter member of the U.S. Army Ordnance Museum Foundation, Inc., has written a very smooth monograph about the history of an original Henschel Tiger I from factory to fighting to "internment" at Aberdeen Proving Ground, Md., and the reasons for its present whereabouts in the Federal Republic of Germany.

Tiger is well illustrated and has ample views of the title vehicle, with additional information that rounds out the picture quite well. A bibliography, photographic credits, footnotes, a comparison chart of the Tiger I versus Allied tanks and tank destroyers, index, and a note about the Ordnance Museum Foundation are found at the end of the book. He clearly explains how the Tiger I was developed, its good points (armor and firepower) and bad (mobility and speed), minor field modifications in North Africa, and how this particular Tiger was found abandoned (but not destroyed) in the U.S. II Corps area of Northern Tunisia and first reported in British (!) notes on June 9, 1943.

However, the unstated goal of the book is an appeal to support a private group dedicated to historical preservation of irreplaceable military artifacts at the Ordnance Museum. With cutbacks in federal funding, wheeled and tracked military history is actually rusting away from lack of facilities to store them out of the elements at Aberdeen. I've driven past Aberdeen's outdoor vehicle display several times; it's impressive, but I didn't realize until I read this book that maintenance, much less restoration, is sorely lacking for those wonderful

monuments of history. I strongly urge those interested in preservation to send a donation to this all-volunteer (no paid staff) organization, whose primary goal is the construction of a facility to house the artifacts. If Mr. Cox's enthusiasm and scholarship are indicative of the dedication of the Foundation's members, there is yet hope for saving mobile history at Aberdeen.

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Software Review

The Great Generals of the 20th Century by Flagtower Limited, \$29.95. E-mail: 100546.1716@compuserve.com

Minimum system requirements: Multimedia PC with a 486DX33 processor, 8 MB RAM, 2X speed CD-ROM drive, 256-color SVGA, sound card, mouse, 8 MB hard drive space.

"The Great Generals of the 20th Century" bills itself as an entertaining multimedia presentation and a rich, authoritative reference tool. I found it to be professionally produced but remarkably shallow, much like an over-hyped media event: all glitz, little substance. This is rather distressing given the huge amount of space potentially available on the CD-ROM, and the small amount of actual historical content placed on this one.

The main menu of the CD-ROM follows the lives of 15 famous generals by grouping them into three main tracks: World War I, World War II, and Post War (Vietnam, Arab-Israeli Wars, and Desert Storm). As usual, Korea is neglected — although Douglas MacArthur is covered during the WWII section.

Each general's story is told with beautiful graphics and sound clips, and is told as a narrative of his participation in the current war period. To find out about the actual general in question, however, you click on another icon, and the information is somewhat bizarrely broken down into different subtopics such as Resume, Broadcasts, Public Face, Battle Experience, and Pressures.

To illustrate the lack of depth of the program, the resume for Patton contains all of about 180 words spread over three multimedia pages. The accompanying pictures are nice, but the informa-

tion is shallow. Any good encyclopedia would have much more information about all of these generals and warfare.

The CD-ROM contains supplemental factsheets on Technology, Battle Visuals, Personalities, On the Battlefield, Dispatches, and Profile (Profile being another biographical sketch section). This attempt to provide background information is again extremely limited. The Technology section covers Aircraft, Artillery, Equipment, Guns and Small Arms, and Tanks and Transport. The corresponding one page entries number 19, 8, 11, 14, and 23.

The program's strong points are the introductory tutorial and the index, which both perform their functions well. The weak point, as stated, is the totally superficial information. The program looks good, and sounds good, but tells you very little.

The program installs without a hitch, although it ran extremely slowly on my 486-66 VESA local bus with a Diamond Speedstar Pro graphics card and 2X speed CD-ROM. The audio portions would sometimes be jerky while waiting to load. When I used my Pentium 133 with a 6X speed CD-ROM, the program ran much better, but the point remains that the company's minimum requirements should probably list a Pentium 100+ and 4X speed CD-ROM.

I was not really impressed with this program; although it does perform, the actual learning value is small. I would only recommend this program to possibly help inform someone who has little interest in the military, as the multimedia approach may help keep their attention. The serious military professional will gain nothing from this disk.

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The Crew Station Trainer (CST)

by Master Sergeant David T. Worley,
M1A2 NET Team Chief

The Crew Station Trainer is a stand-alone or networkable M1A2 tank training device. It was developed collectively by the New Equipment Training (NET) team, Program Manager (PM Abrams), and General Dynamics Land Systems (GDLS) for NET training and Doctrine and Tactical Training (DTT).

The CST utilizes a Sun SPARC work station with 535 megabyte internal hard drive, 32 megabyte random access memory, Solaris 1.1.1 operating system, 2.4 tank (GDLS) application software, touch screen, 20-inch color monitor with 1152x900 resolution, M1A2 Commander's Control Handle Assembly with switches, cursor active, operating on an Ethernet networking up to 21 CSTs. SINCGARS replication is possible for tank-like operations on the net. There are currently 40 systems in use with the NET team, 35 systems at Fort Hood for fielding of the M1A2 tank to the 1st Cavalry Division, and five at Fort Knox for NET and DTT instructor train-up.

The CST is capable of supporting multi-echelon training. The primary role of the CST is as an individual skills and crew coordination trainer, necessary skills required to operate the M1A2 tank. Beyond these basic and essential capabilities, the CST is used to conduct digital platoon-level to battalion-level exercises with some brigade-level application. The CST in these exercises is capable of training and sustaining the mission planning, reporting, and command and control functions of the M1A2 tank, both in offensive and/or defensive scenarios. Furthermore, the CST has applications that assist in maintenance training of the Built-In-Test (BIT) and Fault Isolation Test (FIT) which are embedded in the M1A2 tank.

The NET Team uses the CST to introduce and train the soldier-machine interface (SMI) and explain the functionality of the M1A2 tank screens at the Driver's Integrated Display (DID), Gunner's Control Display Panel (GCDP), and Commander's Integrated Display (CID). This training is conducted at a student-to-instructor ratio of 36:1, as opposed to training conducted on the tank at 4:1. The CST allows soldiers in training to become fully familiar with the operations of the new tank prior to any hands-on training. This reduces the fuel and Class IX needed for the NET process. The classroom is also more conducive to learning the SMI and functions of the tank displays (the classroom is air-conditioned and heated).

Training is conducted on a staggered schedule. A tank battalion is divided in half, and its training conducted on a 2-day rotation. Two companies receive training in the classroom, followed by training in the motor pool, and then the other two companies start training. This rotation continues throughout the 20-day NET training cycle.

One primary instructor and six assistant instructors conduct the classroom training. The primary instructor presents all information required to operate the station being trained and projects the display on a screen observable by all the students in the classroom. The students follow along with the PI on their CST.

One of the CST's key functions is its ability to train the unit on the uses of the Inter-Vehicular Information System (IVIS), which is the major part of the training required to master the M1A2. IVIS is the information system that enables the tank to use the digital data link between other digital systems on the battlefield. Some of the information that passes through IVIS are mission planning (graphics), position updates (both your tank and the location of all IVIS-equipped vehicles on the net), reports (spot, contact, request for fires, request for air, medevac, sitrep, etc.), and enemy location.

The CST has been used to train 3/8 and 1/7 Cavs at Fort Hood. The system was a great help in reducing the number of instructors required to train these units. During the training, numerous soldiers of 3-8 Cav made favorable comments on the training. SFC Bitz wrote, "The entire course was broken down to where the most computer-illiterate person on my crew could comprehend and follow." From another crew in A Co, "CST...made learning seem real life for the privates who were having trouble." The crew of A11 wrote "CST is an excellent investment." The crew of D32 wrote the CST was a good training tool because "I feel that the crew watching someone else do it before they get to the tank helps a lot."

As the Army moves forward into the 21st century, the digital classroom will and must become an integral part of training and sustaining a unit's digitalization capability. Systems such as the CST will ensure that we train intelligently for the future battlefields our tankers will find themselves on.