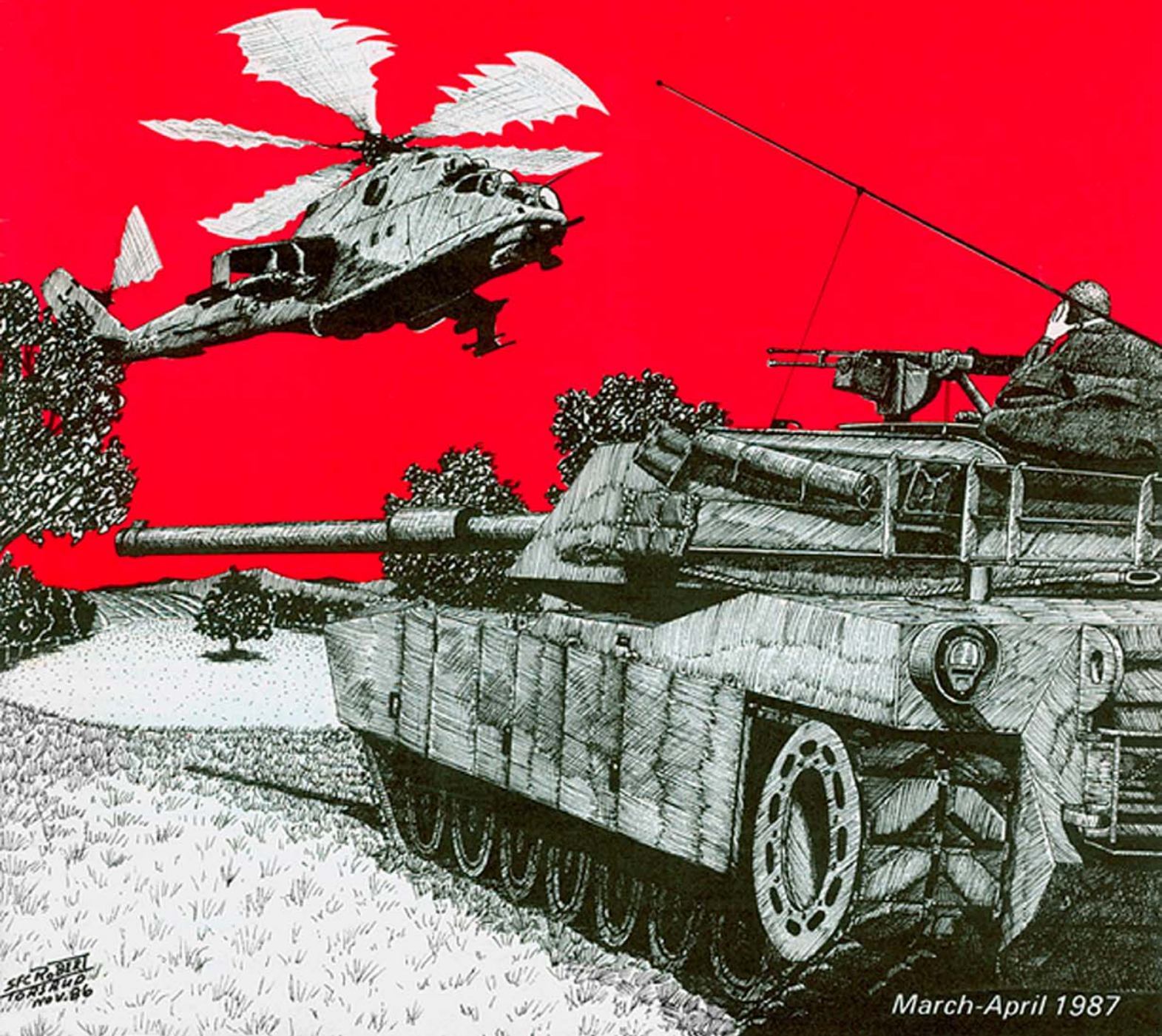
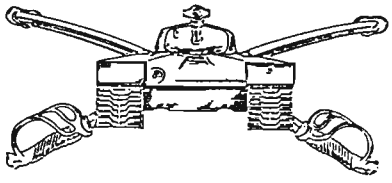
ARMOR

The Magazine of Mobile Warfare



March-April 1987

SCHWERPUNKT



Not long ago, a friend and I were talking about commanders for whom we had worked. Looking back over the past sixteen years, we both discovered two qualities common to the good commanders. Not surprisingly, these same two qualities were usually lacking in the commanders we didn't believe were effective.

The first quality was that the good commanders didn't take themselves too seriously. I don't mean that they didn't take their responsibilities seriously; in fact, the good commanders took their positions and their professions very seriously. What I mean is that the good ones were always willing to laugh at themselves. They had a sense of humor that made them human to their subordinates and often took the edge off of stressful times. They never considered themselves more important, or better, than their soldiers. Believe me, their soldiers worked harder and better as a result.

The second quality that made these officers "a cut above" their contemporaries was their ability to work effectively in unusual or unordinary situations — situations for which their training or experience had not prepared them. No matter what the problem, these commanders had a "mental mobility" from which they drew the wisdom to solve problems effectively and efficiently. Additionally, their people learned from the experience; the experience wasn't just another problem for them to handle for "the old man."

Upon my first reading of **Lieutenant General Sam Myers'** most recent installment of "Random Recollections," my first reaction was: "What does this have to do with Armor and Armored Cavalry?" Almost immediately, though, I saw that this story related an incident in which an officer — a cavalry officer —found himself in a situation and with a problem for which he had no formal training or education. More importantly, this officer found a way to solve the problem and work effectively in that foreign culture without losing his sense of humor. The story represented exactly those qualities that my friend and I had identified only a couple of weeks before I received "The Gafsa Girls." I don't believe that anything like this story has appeared in *ARMOR* before, and I doubt if anything like it will appear again. All too often we *all* take ourselves too seriously to permit the telling of a story that doesn't relate the "historical glory" of our unit — or our time-honored technical and tactical competence.

As you read this story, think about some of the unusual situations in which you have found yourself. Do you have that mental mobility so necessary for a leader and commander today? Ask yourself if you too have a sense of humor that makes you human to your people. Do you take yourself so seriously that your people work because they don't want you to "chew them out," or do they do their best because they know you'll appreciate their efforts? While I doubt you will ever find yourself in the same situation as did the commander of the 'race track gang,' I hope that you see a little of yourself in the story we call "The Gafsa Girls."

— GPR

ARMOR The Magazine of Mobile Warfare

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FEATURES

DEPARTMENTS

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LETTERS

New Boresight Instrument

Dear Sir:

I note with interest an article, "Helpful Hints To A Good Boresight," by Captain Philip S. Sperling in the Nov-Dec 86 issue of *ARMOR Magazine*. The article suggests a method of eliminating parallax in the Pye Watson boresight by using dark colored adhesive tape with a punched hole on the eyepiece.

In August, 1986, after a full competitive evaluation, Lenzar Optics Corporation was awarded a large multi-year award for the M26, 105/120-mm muzzle boresight device. The Lenzar boresight will be the new standard for the U.S. Army. The device is inherently self centering, does not require rotational readings, has a 10X magnification, and has a +/- 4 diopter eyepiece adjustment to compensate for parallax without a fix of dark colored tape. The boresight was designed and will be manufactured in the U.S., and although we admit to being partial, we believe our soldiers will now have the finest large caliber boresight device in the world.

BRAD GANTHER
Lenzar Optics Corporation
Riviera Beach, FL

Clarke Article Lauded

Dear Sir:

How sweet it was to again read an article by General Bruce C. Clarke in your Nov-Dec issue. (See "An Estimate of the Armor Situation.")

As usual, General Clarke asks some very big questions and reminds us armor types, as well as the whole Army, of some very important lessons learned, but unfortunately forgotten over time.

Having served under General Clarke's command in 7th Army as a young lieutenant, and again as a battalion S3 when he commanded USAREUR, I've grown over time to realize he is truly one of our all-time premier trainers and combat leaders.

CLARK A. BURNETT
Colonel, Armor (Ret.)
Enterprise, AL

Liquid Propellant Developments

Dear Sir:

The September-October 1986 issue of *ARMOR* contained a well-written article entitled "Novel Tank Guns?" by Richard Ogorkiewicz, which warrants additional comment. Mr. Ogorkiewicz may not be aware of the full range of liquid propellant work ongoing in the U.S. It is critical to the evolution of the Close Combat (Heavy) Force that we objectively evaluate all emerging technologies associated with tank gun systems. We need to ensure that the needs of the force drive technology to the heights necessary to minimize battlefield deficiencies and defeat the threat. AirLand Battle and Army 21 doctrine may be unnecessarily burdened with potentially outdated technology if we wait through another generation of solid propellant tank guns without accurately assessing the total systems benefits of a liquid propellant tank gun.

Mr. Ogorkiewicz provides an excellent overview of the past successes of the GE Regenerative Liquid Propellant (LP) Gun program. This success has been achieved with considerable support from the U.S. Army Ballistics Research Lab (BRL) and the Armament Research, Development, and Engineering Center (ARDEC). However, I must disagree with the author's statement that, "...liquid propellant guns do not offer that many advantages over solid propellant guns as tank guns." On the contrary, the potential gains from a liquid propellant tank gun, as employed in accordance with AirLand Battle doctrine, are quite significant.

Performance of the gun itself, measured in terms of rate of fire, accuracy, and ability to penetrate enemy armor, is obviously the most critical evaluation. The ability to penetrate enemy armor depends on several factors, including projectile kinetic energy and projectile design. As the author discussed, increases in kinetic energy can be achieved by increasing muzzle velocity or developing larger caliber ammunition. Unfortunately, with conventional propulsion, both approaches will necesitate large increases in gun weight and size, and consequently have an adverse impact on the total tank system.

General Electric and BRL are developing a novel approach to achieve significantly higher kinetic energy using a liquid propellant travelling charge. The travelling charge acts as a high pressure, in-bore rocket, and offers greatly increased projectile kinetic energy with relatively little increase in gun weight. Design studies, based on the use of LP travelling charge, indicated that it should be possible to design a tank gun which would launch the current 120-mm projectile with a velocity in the 2-3 km/sec range, with only slight increases to gun weight and volume.

Firepower would be further enhanced with an autoloader system able to store and handle only the projectile itself — not the propellant or the casing and primer. The elimination of the casing and solid propellant would permit an LP version of an M1A1 to carry an estimated 56 stowed rounds. Ready rounds would increase from the current 17 (hand-loaded) to approximately 48 (automated). Rate of fire would increase to an estimated 20 rds/min (KE) and 13 rds/min (HEAT). These estimates are based on a one year LP Armor study effort performed by GE in 1985 for the BRL.

As a system, an LP-equipped Close Combat (Heavy) vehicle offers even greater gains. The ability to use a simpler and smaller autoloader device coupled with the storage flexibility and much higher packaging density of liquid propellants, would yield considerable turret design flexibility and the potential for decreasing vehicle profile and size. Mr. Ogorkiewicz highlights the survivability advantages to be gained through LP-equipped platforms. In fact, the family of monopropellants in use is actually water soluble, low in toxicity, and highly resistant to initiation by fragments and shaped charge impact. The logistics benefits of a bulk-stored and bulk-loaded propellant are substantial. Additionally, current estimates indicate that per shot propellant costs for an LP tank gun would be less than one-sixth that of solid propellant costs.

In summary, a liquid propellant tank gun offers significant system benefits including higher muzzle velocities, reduced vulnerability, smaller vehicle size, increased rate of fire, more stowed ammunition load and decreased logistics burden. The key is that we not resign ourselves to a less than optimal choice for the next generation of tank guns based solely on estimated engineering timeliness. Mr. Ogorkiewicz closes his article by stating that, "...it is necessary to continue the development of solid propellant tank guns and to produce at least one more generation of them." I agree — we do need to continue the development of solid propellant tank guns — but we must also push the development of liquid propellant guns. When it comes time to decide on which will be in the next generation of armored vehicles, the decision should be based on the system that best meets the needs of the armor trooper to fight and win on the next battlefield. Needs of the Army must drive technology, not vice versa.

CHRISTOPHER J. KILLOY
Program Engineer, GE
Captain, Armor, USAR
Pittsfield, MA

"Which SABOT?"

Dear Sir:

At present both the APDS and APFSDS rounds are announced in the fire command as "SABOT." The two rounds do, however, have different ballistics and, therefore, different trajectories.

The Army has acknowledged these differences by installing separate cams for each in the M60, M60A1, and M48A5 tanks. Also, the M60A3 has two ammunition select buttons, one marked APFSDS and the other APDS. When changing from one to the other, the gun does, in fact,

move to compensate for the different trajectories.

If we had to fight tomorrow, both rounds are still in inventory, and would certainly be issued. Can we afford to ignore the possibility of combined loads in our tanks? Imagine the devastating confusion when the TC orders, "GUNNER, SABOT, TWO TANKS...," and both the gunner and loader reply, "*which* SABOT?"

The bottom line is that we don't train with APFSDS, so we don't have a fire command for it.

Please consider this a plea for fire commands that tell the crew what round the TC wants to shoot. I propose a change in fire commands to announce APDS as "SABOT," and APFSDS as "FIN SABOT."

DAN DENSFORD
Major, Armor, TXARNG
Houston, Texas

This SABOT

Dear Sir:

Current stocks of spin stabilized service ammunition (M392A2) are being retrograded and fired either in tests or in training at the NTC. This retrograde is expected to be complete in 1990. The probability of mixed ammunition loads on a tank is currently small, and is decreasing to the point of being impossible in 1990. If M392A2 were not being retrograded, MAJ Densford would have a valid point. In view of the situation, a change to fire commands would be of little current (and even less future) use for worldwide application.

Tank fire control systems have separate ballistic solutions for spin (APDS) stabilized M724 training and M392A2 service ammunition, and for fin (APFSDS) stabilized service ammunition. There is a large ballistic difference, as MAJ Densford points out, that requires separate solutions for spin- and fin-stabilized ammunition. There are not, however, separate solutions for each model (M735, M774, M833) of fin-stabilized service ammunition on M60/M48 series tanks. Ballistic characteristics of these rounds are sufficiently similar to allow their firing with one fire control solution and still maintain system accuracy requirements. This also reduces production costs and eliminates the chance of confusion over "What type of *fin sabot*?" Additionally, there is only one spin-stabilized solution (M392A2) in the fire control computer, with which both M392A2 and M724 are fired.

Unit SOPs should address upload of ammunition to preclude mixed types (spin- and fin-stabilized) on board a tank. If ammunition is mixed on a tank, SOPs should also state that the fin-stabilized ammunition should be fired only at tanks.

DANIEL E. DETER
Colonel, Armor
Director, Weapons Systems Dept.
Fort Knox, KY

Crews Can Cope

Dear Sir:

Despite the fact that our stocks of M329A2 ammunition will be consumed in the near future, the CAM/ballistic solution for spin stabilized munitions will remain in the tank's computer for some time in order to fire the M724 training sabot. Unless the cost of newly developed rounds with fin stabilized type ballistic similitude comes down considerably, the M724 will remain the KE training round in most locations.

In keeping with the "keep it simple" philosophy, the tank commander's decision in the heat of battle is a choice between two rounds, KE or CE. His choice is then announced in a *standardized* fire command to his crew. The occasion of having two types of KE ammunition on board will be the exception (diminishing over time) and can be easily handled on an exceptional basis by the crew. It certainly does not warrant making a change to gunnery training for the entire Armor force. We need to credit our tankers with the ability to cope with a simple problem of segregating rounds by type within the ammo racks and possessing the teamwork necessary to recognize and announce the lesser KE round once the "best" KE round is no longer available.

DOUGLAS R. BURGESS
Colonel, Armor
TSM Tank Systems

Reflections on Korea

Dear Sir:

"Armor Operations and Training in Korea" by Lieutenant Colonel Koropey (Nov-Dec issue) I thought excellent and timely; further, I found his conclusions valid and realistic. Following enlisted infantry service in the Korean War (Co L, 35th Inf, 25th Div; Dec 1950 to June 1951) I had commissioned service in Armor. In March 1986, with a veterans group, I had the privilege of revisiting Korea, including many places memorable for events of 35 years before. Against this background I offer some additional comments on the subject of Lieutenant Colonel Koropey's article:

Indirect fire with the tank main gun was "frequent," but rare and generally conducted as a sort of intellectual exercise. For many reasons, especially in mountain terrain, indirect supporting fires are best left to the mortars and artillery. Our infantry is more apt to lack *direct* supporting fire, which you find wherever you can. Two classic examples, both from weapons designed for air defense, were the German Army's use of the 88-mm in WW II and our use in Korea of the halftrack-mounted "quad fifty."

"The Defile Problem." Lieutenant Colonel Koropey notes that the usual solution of moving infantry along ridgelines while tank-infantry teams move along the valley roads is "thorough but awfully slow." The 35th (CACTI) employed this very method in and along the Uijongbu corridor in the UN Counteroffensive of late May 1951, and found a way to speed up the tempo somewhat. Enemy defensive and delaying positions were located on successive peaks of the very large hill masses common to Korea. As shown by the Regimental Command Report for that month, while one unit advanced along the high ground, others advanced by road (tank-mounted, often followed by additional truck-mounted infantry) to attack the flanks and rear of an extended objective area in simultaneous coordinated attacks. The first day of this phase was marked by hard fighting and slow going, but rapid movement, almost without enemy contact, ensued for the next several days, carrying up to and past the 38th Parallel.

Thorough clearing of all enemy during an advance was found essential in Korea. Bypassed North Korean units, of the same race and language as the South Korean population, had the inherent capability to go temporarily underground, and this capability was emphasized in their training and doctrine. Later, when opportunity offered, these units (in a few cases up to divisional size) could retrieve uniforms and weapons and reengage, in conventional or guerrilla-type operations, and against either supply installations or the rear of our frontline combat units. Pockets of subversive elements in the South Korean population also aided this enemy capability.

Americans with a blitzkrieg background from WW II (especially impatient tankers) were always on the lookout for a chance at the rapid, deep, and decisive maneuver. Tank-infantry formations of battalion size, intended for an independent operation of several days duration, were commonly called "task forces," and often employed, but generally with little result. An example was Task Force Lee (after LTC James H. Lee, an Armor officer then commanding 3rd Bn, 35th Inf), on 18-19 April 1951. UN forces were across the parallel, on the western front, but the CCF spring offensive was expected momentarily (it actually came in full force on 22 April). The TF included 300 infantry and 38 tanks (89th Tank Bn), its mission apparently being reconnaissance in force with some hope it might develop into a spoiling attack. The first day's advance was halted, after five miles, by enemy artillery fire, which is bad news to infantry riding on tanks. Returning to assembly area for the night, the TF moved out next day at 0630 only to be stopped after three miles by a blown bridge and evidence of a few land mines. The mission was cancelled and the TF dissolved.

The preceding is also enlightening on Lieutenant Colonel Koropey's discussion of "Barrier Obstacles." Complex and extensive obstacles of the kind he described would no doubt be encountered in special

circumstances, but day in and out a blown bridge and even the suspicion of a handful of mines was generally sufficient, especially if covered by any degree or kind of fire. We had not armored personnel carriers in those days, but my considered opinion is that — though very useful for limited purposes — their use would still not suffice to permit mobility, in the armor sense, on the Korean battlefield.

My conclusion is that the METT factors dictate that that war, and any recurrence, must be accepted as an infantry war. Tanks, invaluable though they are, must resign themselves to a supporting role. Mobility at the operational level will have to come from amphibious means, as at Inchon, or from airborne/air mobility resources, and not from armor.

Some unusual uses of armor were found, especially in operations related to the assault crossing of the Han River on 7 March 1951. First, engineer trailers loaded with the assault boats were towed to the pre-dawn crossing sites by tanks, rather than engineer vehicles, which kept down congestion and confusion on the approach trails and helped preserve surprise. Second, tankers of Co A, 89th Tank Bn displayed great initiative in locating fording sites and rigging up to ford the river, when bridge construction was delayed, so as to give prompt and effective support to infantry in the bridgehead. These actions are given detailed treatment by Russell Gugeler in his book, *Combat Actions in Korea*. Two other instances occurred after the crossing. One tank was unable to fire its main gun owing to a turret malfunction (I have always harbored a suspicion this condition existed before, but did not deter the tank commander from making the crossing.). The CO of the supported rifle company, Captain Luther F. Weaver (now Lieutenant Colonel, retired), pressed it into service transporting casualties back to the river; these would otherwise have had to be carried by litter across a thousand yards of open rice paddy under enemy fire to the aid station. A few days later a small tank-infantry force (of which the regimental commander, Colonel Gerald C. Kelleher, had taken personal command) was advancing northward along the East bank of the Pukhan River. The road was marked by steep grades, hairpin turns, cliffs to one side and steep drops to the other, such that the tanks were unable to provide effective support. Colonel Kelleher's solution was to send some of the tanks back south to a ford, then across the river, and then northward again, to a point from which effective support could be provided from the opposite side of the Pukhan!

It should be recalled that, in that era, one tank battalion was organic to the infantry division, sometimes with an additional tank battalion attached. The normal breakdown of tank support was therefore a tank section (sometimes a platoon) in support of each committed rifle company. Considering the enemy did not employ armor during the period under discussion, I thought this level of armor support provided a good balance. It should also be recalled that the tank of those days (the M4) had a 5-man crew and an additional cal. 30 MG (toggle-mounted in the bow). Notwithstanding this, I saw instances where a tank crew had affixed yet another cal. 30 MG to the turret top, by welding a home-made mount, for a total of three cal. 30s, plus the cal. 50 and the main gun. This is indicative as to what tankers thought necessary in that particular war.

The one area where I thought improvement was needed was in tank-infantry coordination at the lowest levels (i.e., as between tank crew and rifle squad, or tank section and rifle platoon). In a reported incident in WW II in which 2nd Armored Division prepared to attack through an infantry unit, the infantry commander undertook to explain the fires available to the tank commander and asked which of the infantry supporting fires were desired by the tank unit. The tanker's answer was, "All I want from you people is that you get down in your holes and stay out of my way." This is understandable. But in a war in which infantry was the dominant arm, I always thought it would be nice if the tankers would coordinate something other than time and location of the rifle company's chow line. Especially in a Korean-type war, down at the squad level is where the action is. All too often, during a critical hour or two, the rifle squad is out of direct contact with its own higher headquarters. Tankers were prone to use their own initiative in such cases, and sometimes did good work; but there were instances in which tank fire support, at longer ranges and catching the supported rifle squad or platoon by surprise, was every bit as unsettling as sudden enemy fire from the front.

Loudspeakers on the tanks (reportedly used in WW II) might be a partial solution, also greater effort to habitually marry-up the same tank unit to the same infantry unit. Most important, probably, would be added training and doctrinal emphasis, in each branch, on the special capabilities and problems of the other.

W. B. WOODRUFF, JR.
Lieutenant Colonel, AUS (Ret.)
Decatur, TX

Vermont, Not Connecticut

Dear Sir:

I wish to thank you for your notice on page 49 of the November-December 1986 issue about Norwich University's statue honoring Major General Ernest Harmon.

One of the problems of the nation's first private military college is that everybody thinks we are in Connecticut and the first sentence of your announcement perpetuates the myth. Since becoming President, I have added to the title of the University the title of its two components, the Military College of Vermont and Vermont College, hoping that the addition of Vermont twice in a title might very well dispel the idea that we're located in Connecticut. Interestingly enough, the title, the Military College of Vermont, was given to Norwich University by the State of Vermont in the year 1898 when Admiral Dewey, one of our most renown former students, returned after defeating the Spanish at Manila Bay. From that time until World War II, Norwich was a cavalry school. In fact, at one time the Corps of Cadets was officially the cavalry squadron of the Vermont National Guard. Our cavalry armor traditions run very deep and we would invite you to come to Vermont and visit.

W. RUSSELL TODD
President
Major General, USA (Ret.)

(Ed. Note: See correction in Jan-Feb 87 Regimental Review)

Command List: Additions and Corrections

Editor's Note: In our last issue, we published a list of armor officers serving in command positions at battalion/squadron and brigade/regiment levels. The following are corrections and additions to that list:

LTC James L. Fry
5-12th Cav
Fort Knox

LTC Michael Robinson
2-4 Cav
Fort Stewart

LTC James Larson
4/37 Armor
Fort Riley

LTC Dennis H. Long
4-64 Armor
Fort Stewart

LTC Donald Brunner
3-77 Armor
Fort Polk

LTC Jackie W. Colley
3d Bn, 1st BT Bde
Fort Jackson

LTC Peter Becraft
5th Bn, 3 BT Bde
Fort Dix

LTC Robert A. Duckworth
1st Bn, 3d BT Bde
Fort Leavenworth

COL John Jorgensen
1 Bde, 5th ID, Fort Polk

COL Joe N. Frazar
1st Bde, 24th ID, Fort Stewart

COMMANDER'S HATCH

MG Thomas H. Tait
Commanding General
U.S. Army Armor Center

Reconnaissance

Operations at the National Training Center, as well as examination of recent REFORGER exercises, have indicated reconnaissance weaknesses. There are some organizational problems; however, most of our difficulties are the result of training inadequacies. In many tank battalions, the scout platoon is a stepsister on ammo detail, range guard, or whatever fatigue details come along. Their training takes a back seat, and when they must perform, they don't know how. We have simply failed to follow the old cavalry maxim of "scouts out."

Our reconnaissance elements must operate by stealth. They need to find the enemy without being detected and, equally important, find where the enemy is not. Reconnaissance is a valuable combat multiplier, and our current organizations do not have enough reconnaissance capability. Our scout platoons need the ten recon vehicles of the "H" series, not the six of the "J" and AOE TOE. It is essential, therefore, to train our few scouts properly. For example, how often do the scouts dismount? Not nearly enough! They are wedded to their vehicles. With the introduction of the M3, the difficulty in getting them to dismount increases geometrically. The answer for the scout is not the blitz technique. You cannot seek the seam using the blitz; in fact, for recon units, blitz equals blunder. In 1940, Major I.D. White stated that "the best recon is performed by stealth." Since we lack the firepower that was an integral part of the divisional cavalry platoons, they — as well as the scout platoons — must ensure they are not decisively engaged when seeking intelligence.

Our heavy division cavalry squadrons do not have sufficient capability to accomplish the broad range of reconnaissance missions. Two ground and two air troops just cannot provide the division commander with the ability to gather intelligence throughout the depth of the division area. The air troops have limited effectiveness at night, thereby diluting recon capability when we — with our ground thermal systems — have the tactical advantage. Furthermore, if the division cavalry squadron has to fight for intelligence or is required to perform a guard mission, it must be supplemented with at least a tank company. In order to ensure familiarity with reconnaissance missions, it is probable the division commander will permanently assign a tank company to work with the cavalry squadron. This will help with cohesion and ensure the tankers react with lightning speed. Consider the screening mission. When one considers the speed of current tanks and personnel carriers/fighting vehicles, it is likely that screening missions will become guard missions in a matter of minutes. This argues for the assignment of tanks, organizationally or, as previously stated, by providing a tank company to the squadron from one of the tank battalions. The air scouts can assist in the screening mission; however, their time on station is limited.

Whether or not to have tanks in the cavalry is an emotional subject. We do need them. At the end of World War II, studies indicated that we had to fight for intelligence; thus when the Army was reorganized, tanks were assigned to recon units. In 1946, I.D. White, by then a MG, stated that "aggressive action requiring combat is the best way to obtain info on the enemy." One thing is certain; guard missions require tanks. Our first priority, however, is to provide the squadron commander with a third ground cavalry troop. Without the third troop, adequate coverage of the division sector, especially during periods of limited visibility, is virtually impossible. In Central Europe, where weather conditions are poor during a large percentage of the year, the air troops which can provide flexibility will spend too much time on the ground.

Our second priority will be to put the tanks back in the divisional cavalry. We attempted to do both in the past year and were thwarted. We will attempt to do so again. The value of scouts and cavalry in the accomplishment of security and guard missions cannot, and should not, be understated.

We need your support.

Treat 'em Rough!

Thomas H. Tait

COMMANDER'S HAT

CSM John M. Stephens
Command Sergeant Major
U.S. Army Armor Center

Generic ANCOC

Small-Group Instruction, During-Action Review; After-Action Reviews; Skill Level 04 tasks through Skill Level 03 tasks; AirLand Battle doctrine, gunnery beginning at advanced conduct of fire; elimination of Skill Levels 1 through 3 as formal blocks of instruction; elimination of vehicle specific training; dismounted reconnaissance; multi-echelon training; — hard-hitting platoon sergeant courses for both tankers and cavalrymen that will soon be introduced as the new Generic Advanced Noncommissioned Officer Courses MOS 19D, E, and K Series.

The new courses are being developed the right way — through the systems approach to training.

First, we have had successful platoon sergeants from across the Force come to Fort Knox and analyze the latest job task analysis. Important? Yes, very important! With the introduction of new equipment, the reorganization of our armor and cavalry units, and the increase in the number of light units, there have been considerable changes to the way we do business in the field. That doctrine must be applied to the NCO courses, as well as to the officers' courses.

The Advanced Noncommissioned Officer Course will be mirrored after the Advanced Officer Course 90', recently introduced to the School after a year of design and development work. Although all courses will be resource intensive, it is a price we will have to pay to produce competent officers and noncommissioned officers in order to be successful on the battlefield.

We cannot continue to teach lower skill levels in ANCOC. Lower skill level subjects, basic conduct of fire, ammo identification, etc., have been a part of the ANCOC program of instruction. Those subjects, and many more, have historically been taught in OSUT and more recently, BNCOC. We really never devoted the time to teach platoon sergeants because our courses, both armor and cavalry, were infested with lower skill subjects (not all bad). There is a better way to design and develop a program of instruction so that we can teach the mission-essential tasks for ANCOC and train and evaluate collective and individual tasks at the same time. We are going to do just that.

All tasks taught will be Skill Level 4 and above. This does not mean we will not require proficiency in lower skill levels; just the opposite is true. NCOs will not only be required to be proficient, they will be required to identify collective and individual tasks that support the Skill Level 4 tasks, ensure all tasks are part of the overall training program, evaluate the training program, and conduct after actions reviews with their peers.

The success of this type of program is dependent on small-group instruction — sixteen-student classes working together to develop all the required information to truly accelerate our classroom instruction and field evaluation.

Who will attend? Everyone who expects to be a sergeant first class or better. The rule is out! Some NCOs are not listening. The last ANCOC class had eight SFC shortfalls. They missed their chance!

What is expected of the attendees? First and foremost is job competence. You must be a qualified tank commander! You must have mastered Skill Levels 1, 2, and 3 before attending! Anything short of that will cause problems as you negotiate the course. However, let's say you have been assigned outside of your MOS for the last three years as a Drill Sergeant or Recruiting NCO. If this is the case, you will attend the Tank Commander Certification Course before attending ANCOC. This course will bring you up to vehicle or system certification level before entering ANCOC. The vehicle or system you will be trained on will be the one you will be assigned to after ANCOC.

The cavalryman will not only be trained before ANCOC on the system he is being assigned to, but ANCOC will include some intensive dismounted reconnaissance as well.

An attempt is being made to develop a program that trains all armor platoon sergeants to instructor/operator level on the UCOFT. This will be a big leap and puts the responsibility of UCOFT and crew gunnery training where it should be — in the hands of the platoon's senior noncommissioned officer.

We have needed these changes for a long time; however, it is important that any major changes to a program of instruction be designed and developed correctly. We are still a year away from actually teaching the new program — a necessary sacrifice of time if we are to ensure ourselves a solid, hard-hitting, course for platoon sergeants.

How can you prepare for the course? If you are selected for ANCOC, you should be competent in Skill Levels 1 through 3. Not only should your SQT score reflect your MOS proficiency, you should be a TCCT-1 or SCCT-1 (Tank/Scout Crew Certification Test 1) expert. You should be physically capable of passing the APFT beyond the minimal requirements.

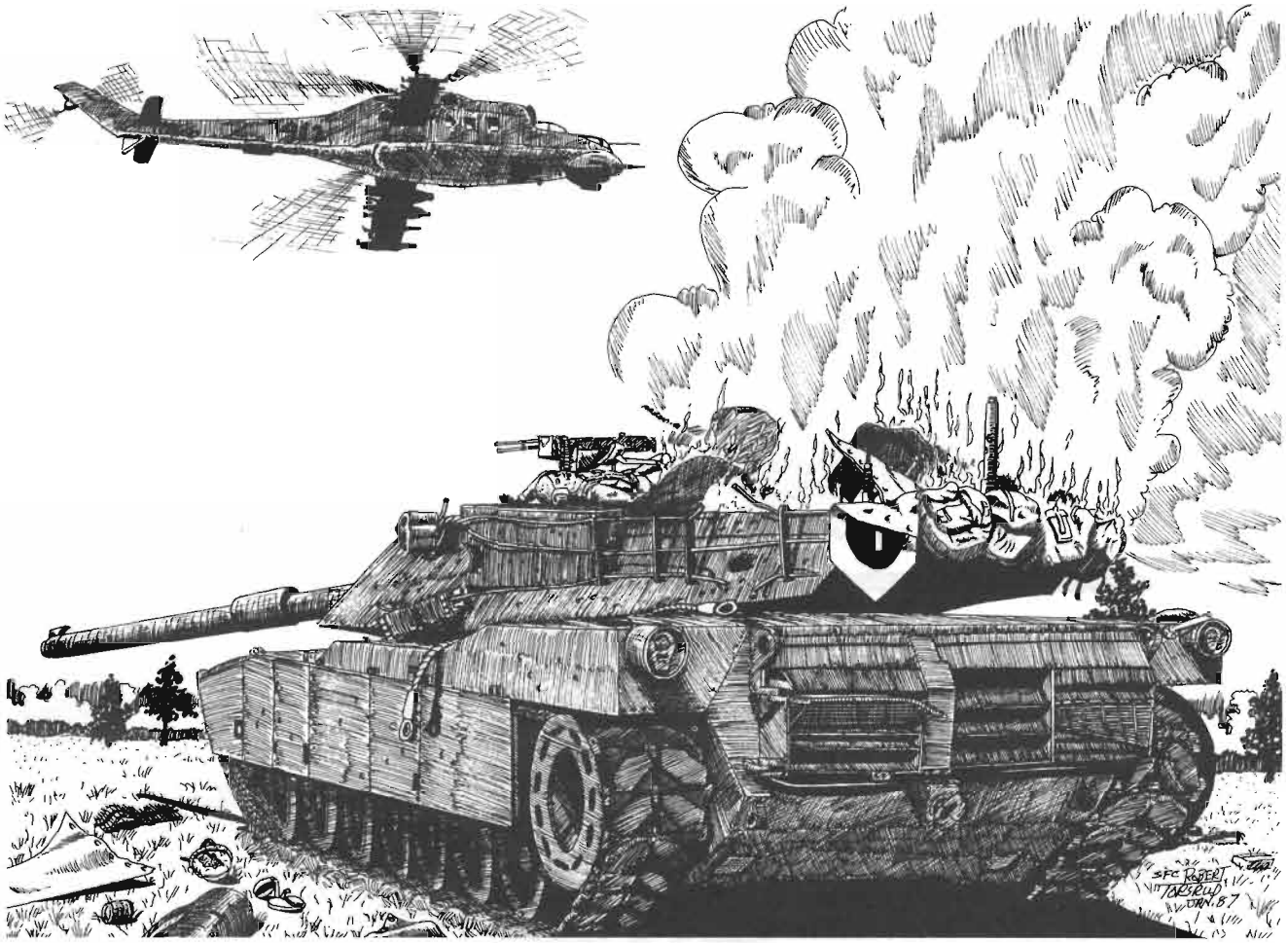
The teaching of this POI will better meet the needs of the Army. The need is, "a highly competent platoon sergeant, highly proficient in skills that surround the MOS, ready to assume leadership positions of higher responsibility."

RECOGNITION QUIZ

This Recognition Quiz is designed to enable the reader to test his ability to identify armored vehicles, aircraft, and other equipment of armed forces throughout the world. *ARMOR* will only be able to sustain this feature through the help of our readers who can provide us with good photographs of vehicles and aircraft. Pictures furnished by our readers will be returned and appropriate credit lines will be used to identify the source of pictures used. Descriptive data concerning the vehicle or aircraft appearing in a picture should also be provided.

Answers on Page 47

The Mi-24 'Hind': A Potent Adversary



U.S. Maneuver Units May Have To Go It Alone Against Soviets' "Flying Tank"

by Captain Carter Myers

Somewhere in West Germany, near the East German border, a U.S. tank company lies in wait in prepared battle positions. The morning is dreary, overcast, and foggy. A Soviet motorized rifle regiment, augmented with elements from an assault helicopter regiment, has moved across the border and is rapidly closing in on the U.S. company. Tank commanders have carefully selected their alternate and supplemental positions and placed their vehicles in hides. Waiting for the last two days, the U.S. soldiers have constantly improved their battle positions. They are well trained; they know their enemy well, and they have performed the myriad of tasks necessary to win the impending fight.

The 1st Platoon leader sights the lead scout of the Soviet advance guard at about 0700 and alerts the company commander, who directs the platoon leader to engage the enemy at 1,800 meters. The platoon leader moves his platoon into hull defilade and waits.

The young lieutenant begins his platoon fire command when the enemy closes to 2,000 meters. His platoon engages the lead scout section at a range of about 1,825 meters, and soon the Second and Third Platoons begin to fire at the Soviets.

When the enemy has closed to 1,000 meters, the U.S. company commander gives the order for a phased withdrawal. Suddenly, two Mig-21s attack. The company's at-

tached Stinger team fires at the first Mig and gets a hit, but the other Mig sights down the Stinger's missile plume and kills the Stinger team with a burst of 23-mm cannon fire. As the tank company team begins to depart, Soviet artillery rains down on the battle position.

The American captain knows that he has to get his platoons back to their subsequent battle positions quickly, so that he can cover the withdrawal of the U.S. company team on his flank. As he moves his company down several covered draws and skirts the edge of a small forest, his lead tanks receive Sagger fire from the edge of a nearby village. The tanks' wingmen return fire quickly and suppress the enemy AT gunners.

The young captain realizes that he cannot get bogged down while moving, so he disengages from the skirmish and orders his three platoons down parallel fence rows. His lead tank platoon is only 500 meters short of its subsequent battle position when the leader's tank takes a direct hit from an AT-6 Spiral guided missile fired from one of four Mi-24 Hind Es hovering at tree-top level on his left flank nearly 2,800 meters away.

As a tank commander, a platoon leader, or the company team commander, what can you do? The Stinger team — your only air defense asset — is destroyed. The Hinds can outmaneuver you, outrun you, and outgun you.

Quite simply, you will do as you have been trained; however, if in your training, aircraft have been conspicuously absent, or the scenario has always conveniently indicated that the air force has given you local air superiority or parity, you and your unit will probably begin to die.

That American tank crews will have to fight Soviet Hinds in any future conflict is quite possible. Air defense assets are precious and, at present, quite vulnerable. American tankers may well have to fight the Hind by themselves. The first step in preparing yourself for fighting Soviet attack helicopters is to know your enemy.

Versions of the Hind

Western defense analysts first observed the Hind in 1973, and controversy concerning its purpose on the battlefield has followed the aircraft ever since. Analysts originally thought the Hind to be a drastically upgraded Mi-8 Hip, but closer analysis showed the aircraft had a completely new fuselage and slightly modified engines, two Isotov TV-2s rated at 1,500 hp each.[1] The Hind A and B (actually, they were developed in reverse order[2]) were the first Soviet helicopters designed to operate on the front lines; the aircraft were highly armored and carried a large amount of armament. Earlier helicopters, the Hip and Hound, operated near the front lines, but were primarily for transportation. Some analysts believe that the Soviet design engineering group proposed a pure gunship and received the go-ahead as long as the design incorporated some troop-carrying capability so a new troop-carrying helicopter would not have to be funded.[3] The resulting product more closely resembles a flying Merkava than any Western helicopter. Figure 1 illustrates the different models of the Hind.

The Hind family is quite technologically advanced among Soviet helicopters. Its five fiberglass rotor blades are more than 55 feet long and produce a considerable ground signature. The all-metal fuselage has retractable landing gear and self-sealing fuel tanks.[4] There are distinct differences between the A/B/C models and the D/E/F models.

The A model has a lightly armored fuselage and, as a result, has been relegated to convoy escort in Afghanistan. The A model is a likely candidate for transporting "Spetsnaz" or air assault troops into our rear areas.[5] The B Model was probably an experimental model, and had no anhedral (downward slant) on its wings. It also never went into actual production. Analysts believe that the C Model is a training version since it has no armament. The later models (D, E, F) are redesigns and upgradings for antitank and attack roles.

The anhedral wings of the Hind are one of its distinguishing features. These wings provide lift and stability at cruising speeds and also act as launch stations for weap-

Model	Armament	Nose/Turret	Additional Differences
A	4 x AT-2 Swatter ATGMs 12 x 57-mm unguided rockets 1 x 12.7-mm MG	3-man crew, relatively unprotected	Initial production model. Engines: 2 x TV-2 Isotov @ 1500 hp ea
B	Same as A model	Same a A model	No anhedral on wings. Very low production.
C	None	Same as A model	No armament. Very low production. Used for training.
D	4 x AT-2 Swatter ATGMs 128 x 57-mm unguided rockets, 80 x 80-mm rockets, 4 x 12.7-mm MG	Redesigned and armored turret. Pilot/gunner seats in line. Bullet-resistant glass.	Target acquisition enhancement: Optical LLTV, Laser, IR
E	Same as D model except: 4 x AT-6 Spiral ATGMs, 2x23-mm cannon pod	Same as D model	Engines for D/E/F: 2 x Isotov TV-3 @ 2200 hp each.
F	Improved Weapons Capability	Same as D model	Triple rail missile racks on wing tips. Possible export version w/AT-2.

TECHNICAL DATA: Height: 14'0" Weight: 6000 kg Length: 55'9" Empty Rotor Diameter: 55'9"

Figure 1: Versions of Hind

ons. But while hovering, the Hind requires a significant increase in power because the wings cause a negative effect on the lift provided by the downward motion of the air from the rotor.[6]

The Hind D was a major redesigning of the basic aircraft. The designer added additional armor, particularly in the cockpit area. The cockpit and forward fuselage were completely redesigned, with the gunner and pilot sitting in line rather than side-by-side. The gunner is in the forward position. The D model could also carry additional weapon systems, along with improved targeting devices, such as radar, low-light television (LLTV), and a laser rangefinder.[7] Two improved engines appeared on the D model; each now developed 2,200 hp, and the cargo area was redesigned, probably to carry extra armament and ammunition rather than troops. A four-barreled, 12.7-mm gun replaced an earlier 12.7-mm machine gun.

Capabilities

All models, except the B and C models, can fire the AT-2 Swatter antitank missile from the weapons points on the wings. A greatly improved version of the aircraft, the Hind E, carries the AT-6 Spiral command-guided AT missile, along with improved targeting devices, such as a head-up display. The Hind E also carries a two-barreled, 23-mm cannon pod.[8] The AT-6 Spiral is of particular interest to us since it has a 5-km range and flies at supersonic speeds. The possible combination of a laser designator and the supersonic speed of the Spiral will reduce the unmasked time for the Hind E in an engagement. A 5,000-meter-range target can be hit in approximately 11 seconds compared to the 27-second flight time of the Hind D's Swatter fired at a 4,000-meter target.[9] Both missiles fly by line-of-sight command guidance, so your best defenses are to place terrain between you and the Hind or to fire directly at the Hind to break the gunner's concentration.

The Hind can also carry free-fall bombs, rockets, and mine pods. Since free-fall bombs require the pilot to fly over enemy positions, they will probably only be used in relatively safe (in terms of air defense) areas.[10] The 57-mm rockets

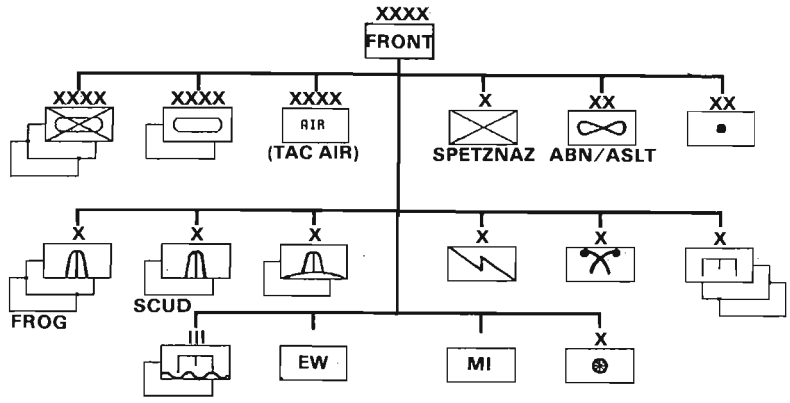


FIG 2. SOVIET FRONT

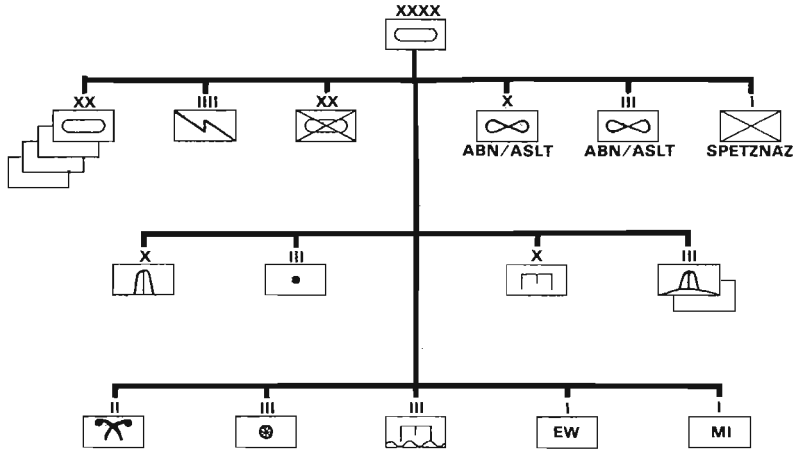


FIG 3. SOVIET TANK ARMY

are unguided projectiles, similar to the 70-mm rockets carried by the U.S. Cobra, and are relatively inaccurate. The flat part of the trajectory of the 57-mm rocket only reaches out to 1,200-1,500 meters.[11] Because of the rockets' dispersion pattern, gunners normally fire them in salvo against soft targets. However, their hollow-charge warheads are capable of penetrating 230-mm of armor. A newer, 80-mm rocket may appear on the Hind in the future, and with the ability to penetrate 350-400-mm of armor, these rockets could present a potential danger to US armored units.[12]

Soviet helicopter design philosophy is radically different from US thinking. The US Army has placed its faith in small, highly maneuverable aircraft capable of hiding and flying in the tree lines and possessing precision guidance for night and adverse weather conditions. The Soviets have developed the Hind for a multipurpose role. It more resembles a flying tank than a helicopter. By US standards, the Hind is underpowered and its rotor incorporates a relatively old technology; therefore, it is probably not very agile.[13] Its lack of agility, large rotor blades, and difficulty in hovering will preclude flying nap-of-the-earth (NOE) under most terrain conditions. Hinds will probably attack at a 100-200 meter altitude and pop up when in the vicinity of the target for better acquisition and target lock-on.[14] The Hind's size and lack of agility will allow US air defenders and tankers to train better and plan to defeat this "flying tank."

The Hind in Afghanistan

Until the Soviets invaded Afghanistan, analysts had never been able to assess the Hind's ability in actual combat. The "Mujahadeen," the Afghan freedom fighters, have had much experience with the Hind.

The Mujahadeen have brought down several Hinds with small, heat-seeking, surface-to-air missiles, such as captured Soviet SA-7 Grails. The Hind's original design failed to include much in infrared countermeasures, and little has been done to reduce its infrared signature, other than a slight reduction in engine operating temperature.[15] In response to their losses of Hinds and other types of helicopters, the Soviets have equipped them with flare dispensers, holding up to 120 flares, along with a missile warning system.[16] Nevertheless, the Mujahadeen antiaircraft effort has been effective: for example, eight Mi-8 Hips were lost in 1983 in just one operation.

To bring down Hinds by machine gun fire, the Afghan freedom fighters fire down on the rotor, upper fuselage, and the engine/transmission area from higher vantage points on mountaintops as the Hinds fly down the valleys. An Afghan pilot of the Communist Afghan Army, who defected in 1984, disclosed that the Hind A was extremely vunerable to ground fire, especially in the cockpit and the rotor. He said that pilots are routinely warned to avoid heavy rebel concentrations. According to the defector, more Hind As were lost to small arms fire to the cockpit than any other cause, and a steel plate has been installed that can be manually raised to protect the pilot. The report in *Aviation Week* (October 1984) continued to state that the Hind A was indeed under-powered for most of its combat tasks and had a very weak tail boom. Of extreme interest is that the Mujahadeen also reported that about 30 percent of all munitions used against them failed to detonate.

Employment in Europe

Judging from Soviet training exercises, battlefield employment of the Hind in Europe will probably be markedly different from its use in Afghanistan. The Soviet helicopter force belongs to the Soviet frontal aviation element (tactical air force) and is usually attached to front-line units at high levels, such as the front or all-arms army. Typically, there is one air assault brigade per front, and one assault helicopter regiment per tank/all arms army (See Figures 2 and 3). One result of this high level of attachment may well be an inherent inflexibility: Soviet helicopter pilots seldom attack targets of opportunity, as seen in Afghanistan.[17]

Other factors leading to inflexibility are the organizational absence of forward air controllers (FACs), the poor quality of battle information being transmitted between ground and air units, and an inflexible pre-planned fire support request system.[18] However, the Soviets may be learning some valuable lessons in Afghanistan. Recently, helicopter assets have been decentralized down to the division with helicopter squadrons under the tactical control of the division commander.

Hinds almost always attack in pairs or in a group of four aircraft (a flight). One reason may be the fear of a defection by a pilot, but tactics also influence this organization. Normally, one aircraft will attack while the other overwatches. The overwatching wingman pinpoints air defense gunners by backtracking the missile plume to its origin and then fires to suppress the air defense gunners or destroy them. One principle of air defense that should minimize this threat is "mutual support"; however, mutual support around maneuver elements (e.g. tank or mech teams) is difficult if the friendly unit is moving. As observed in Soviet propaganda films and TV programs, a typical European mission goes like this:

A flight of 4 Hinds, commanded by a senior lieutenant, lifts off from a forward airfield, 18-20 miles behind the front. The helicopters fly at approximately 150 meters above the ground at about 175 km/hr, using terrain masking whenever possible. The flight descends near the target area, flies to within engagement range, and pops up to about 60 meters of altitude to acquire the target. The helicopters fire while in a shallow dive.

Hinds normally appear in these films to be supporting an offensive operation, rather than a defensive one as would be expected from Soviet journalism. However, expecting the Hinds to fire from a hover in support of a defensive operation is not unreasonable.[19]

About 83 percent of all engagement ranges in European terrain will be 3,000 meters or less, so short range air defense (SHORAD) weapons will be able to defend maneuver elements better than in desert terrain. The European countryside also provides armored units more opportunity for camouflage and concealment.[20]

General Reznichichenko, a respected Soviet author and tactician, writes "...the correlation between tank and helicopter losses are 12-1 or even 19-1 in the helicopter's favor, according to practical experiments."[21] The use of Hinds in a major armored thrust could affect U.S. battle plans considerably. Consider the speed and firepower of the Hind in respect to armored movement: an armor battalion could easily become decisively engaged if the enemy combines a number of Hinds with his armored forces. The Hinds will be able to engage and break away quickly from a superior force, conduct pursuit operations efficiently, and block avenues of escape very rapidly without being encumbered by minefields, obstacles, forests, swamps, or urban terrain.

Hinds in the Desert

In desert operations, the Hind will prove quite a formidable foe as long as it operates below 1,000 feet, the Hawk missile's minimum effective altitude. Since targets can be identified in the desert at ranges of tens of kilometers, the Hind will be able to engage at 4-5 kilometers and still remain out of the range of our infrared air defense weapons (see Figure 4).

The best air defense weapons in the desert are passive IR and optical countermeasures. One of the best optical/IR countermeasures is the desert wind. If you have trained at the National Training Center, you know how that wind can obscure and hide the enemy. This effect is even greater from a flying craft, and gives the ground soldier a much greater advantage. If the tank commander happens to see a Hind launch a missile at him, he will have between 11 and 30 seconds

WEAPON SYSTEM	DESCRIPTION	EMPLOYMENT	MAX EFFECTIVE RANGE	GUIDANCE	MOBILITY
M42 DUSTER	Twin 40-mm cannon (relatively obsolete)	National Guard	1650m AD 4500m surf	Visual	Track
VULCAN	6-barrel 20-mm cannon	US Army	1200m AD 4500m surf	Visual (range only radar)	Track, towed stationary
CHAPARRAL	4-rail launcher, infrared missile	US Army National Guard	5000m	Infrared homing	Tracked, stationary
REDEYE	Shoulder-fired, infrared missile, man portable	US Army National Guard	3000m	Infrared homing	Man-portable
STINGER	Shoulder-fired, infrared missile, man-portable	US Army National Guard	3000m +	Infrared homing	Man-portable

FIGURE 4. US Army SHORAD Systems

before impact at 4,000-5,000 meters. The tank driver must immediately begin quick start-and-stop, side-to-side movements, or make a fast dash to cover, if he wants to live to fight another day. However, remember that the dust cloud sent up by a hovering helicopter can often be as unforgiving to him as your own dust trail as you move. A good air guard — seeing the "bad guy" before he sees you — remains the best defense.

Defeating the Hind

Our most valuable weapons against the Hind are those in the family of air defense weapons. If Hinds fly high enough, the Hawk or Patriot systems can target the Soviet aircraft and destroy it quickly. However, Hinds will usually fly at relatively low altitudes and be masked by terrain and ground clutter. Hence, SHORAD systems will probably play a much greater role in battles with the Hind. SHORAD systems do have their limitations, and soldiers in maneuver battalions should know these limitations in order to make effective decisions on engagements. Figure 4 lists the SHORAD systems available in the heavy division and their capabilities. The following is a breakdown of the SHORAD systems' limitations:

- Vulcan — The primary limitation of the Vulcan is its maximum range of 1,200 meters. When compared to the Hind (with its 3-5 km range), the Vulcan appears quite vulnerable. Unless a Hind moves to within 1,200 meters, the Vulcan can do very little to destroy the Soviet helicopter.
- Chaparral — The Chaparral is a heat-seeking missile (IR) with a range of 5 kilometers. It travels on a tracked carrier capable of firing four missiles before reloading. Since it is a heat-seeking missile, the Chaparral can only fire at the Hind after the helicopter's gun or missile run, when the Chaparral can lock on to the Hind's heat source, its engines. In a frontal engagement with the Hind, the Chaparral has very little chance of locking on and hitting the target.
- Redeye — This missile is also a heat-seeker employed similarly to the Chaparral. The Redeye, though, is shoulder-fired and has a shorter range, 3 kilometers. Obviously all of the problems associated with the Chaparral also occur with this weapon and are accentuated by the Redeye's even shorter range and lack of a multiple firing capability.
- Stinger — This is an improved shoulder-fired, heat-seeking missile, similar to the Redeye but with much improved performance. This missile does possess a limited head-on attack capability, but it is man-carried and lacks any sort of protection from indirect or direct fires.

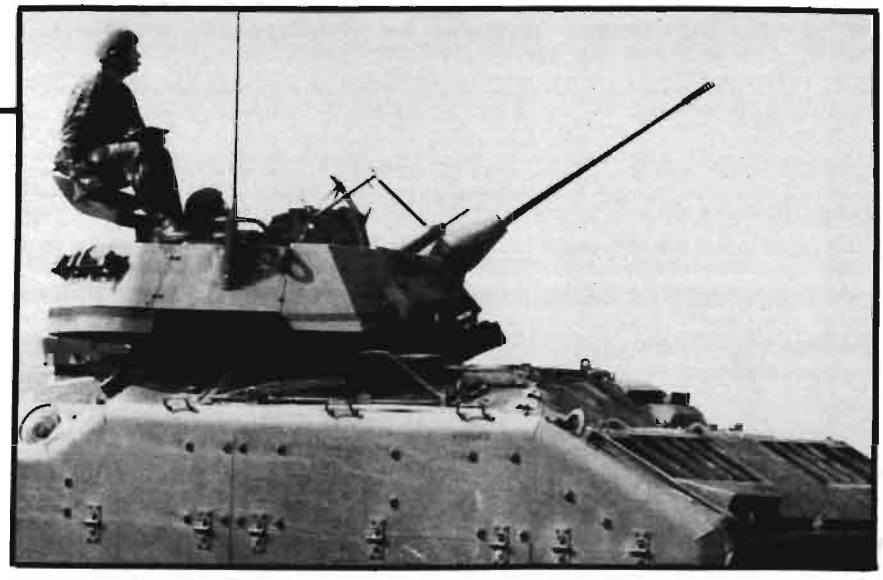
Under current air defense doctrine the commander will allocate these systems differently for offensive and defensive operations.

In an offensive operation, the brigade or task force commander will probably designate his maneuver elements as his priority assets in his air defense plan. The Redeye/Stinger or Vulcan teams will probably be attached to the mechanized elements since they are more mobile. The Chaparral systems will defend more static targets such as bridges, supply routes, TOCs, etc.

In the defense, most air defense systems will probably be distributed to critical logistical and command centers. The brigade support area (BSA), TOCs, field trains, supply and ammunition depots, and indirect fire assets may all be priority assets in the air defense plan.

Our air defense doctrine calls for the placing of missile systems well ahead of the defended asset so that the missiles can acquire an IR lock-on when the aircraft passes by. But if your defending company team is the defended asset, it is not likely that the missile system will be to your front because it would be between you and the enemy. This situation leaves only the Vulcan to protect you from the threat of Hinds. Its limited ranges means that a flight of Hinds can engage you anywhere from 1,200 to 5,000 meters away without fear of Vulcan retaliation. The Sgt. York Divisional Air Defense Gun (DIVAD) was supposed to fill this gap in coverage, but that project has been cancelled.

Moreover, the Air Force will find it difficult to locate and acquire the Hind amid battlefield clutter while its high performance aircraft attempt to avoid the many Soviet air defense systems on the ground. Possible exceptions to this situation are the A-10 Thunderbolt II and the



Army's Cobra and Apache attack helicopters.

The Aviation branch of the Army has realized the deadliness of the Hind and is experimenting with air-to-air missiles and tactics for the Cobra and Apache. The 30-mm tank-busting rotary cannon on the A-10 (the GAU-8/A) is also an excellent weapon for engaging the Hind. If these aircraft are on station in your area, the Hinds will definitely be at risk, but A-10s have a limited time-on-station, and have broad sectors of responsibility. Hence, you will not be able to rely upon them or the Army's attack helicopters in all instances.

With our limited air defense assets, and the Soviet field artillery and frontal aviation placing a very high priority on destroying our air defenses, we in the maneuver battalion task forces and company teams may well find ourselves without dedicated air defense weapons systems to protect us. In essence, the front-line tanker and mech infantryman may eventually face a tank/IFV-versus-Hind engagement. In this type of engagement, the vehicle commander must decide quickly whether to hide or fight. Even if the Hind formation is bypassing your position, it still may be carrying Spetsnaz troops to your own rear areas. If you decide to fire, quickly engage with the heavy machine gun or cannon (on the M2/3). This will alert other friendly forces of the presence of the Hind and give the gunner time to bring the turret (in the case of a tank) to bear on the target so that he may engage with coax or main gun.

Passive Defense Measures

Cover and concealment are critical in evading the Hind. Use natural vegetation as much as possible, and keep your unit well-dispersed. Try to stay away from fields of high vegetation (corn, small trees, etc.) because your vehicles' tracks will give away your position to the Hinds. Natural cover, such as hills and depressions, may be useful when concealing your vehicles from enemy tanks, but the Hind can rise to acquire you, so try to use treelines as much as is possible and feasible.

In the desert, try to move down draws and arroyos to maintain cover. If a Hind spots you and fires, use quick changes to speed and erratic direction changes to mislead the gunner, and try to head for cover.

The late-model Hinds could be equipped with thermal vision devices that could easily pick out hot tank exhausts from a cool background of a forest or ground. Hence, keep your thermal signature in mind and take measures to deflect hot exhausts (from M113-type vehicles, especially).

Active Air Defense Measures

When you encounter the Hind, the tank commander or even the platoon leader will have to make the decision on when to engage. In the act of firing on the Hind, your objective is one of the following four, in this order:

- Destroy the helicopter.
- Force the helicopter out of your area of operations.
- Force the helicopter to fly higher so that long-range air defense weapons or air force attack aircraft can shoot the Hind down.
- Spoil the Hind's aim and/or disrupt his attacking run.

Try to engage primarily with machine guns, but do not rule out the use of your tank's main gun. If within range, use the 25-mm cannon on your M2/3s.

When you engage with machine guns, use the doctrine set down for small arms air defense.[22] The primary principle of that doctrine is to put a heavy volume of fire into the path of the helicopters. Pick a point 50 meters in front of the helicopter, and fire continuously into that point as the helicopter flies toward and, hopefully, into it.[23] If possible, the platoon leader should give a platoon fire command since one platoon, if deployed properly with mutual fields of fire, will probably be able to engage with at least two tanks. The platoon leader should select and communicate the firing point over the platoon net; preplanned target reference points can be useful in this communication. Each firing weapon should fire at the selected point; do not try to lead the Hind. Instead, put up a wall of steel and let the Hind fly through it; you'll have a higher probability of hitting the target that way.

Aim high with your machine guns; use the highest rate of fire, and fire continuously at your aiming point. At longer ranges, the tracers may appear to strike the target, but may actually be striking under it. The Hind's most vulnerable areas are its rotor, tail boom, and its engine/transmission area, so the platoon leader should adjust the platoon's fire to hit those vulnerable areas.

For a Hind crossing to your front within 2,000 meters, you should use the heavy machine guns and the automatic cannons in your unit. If possible, track with the main gun/coax on the tanks. Tracking will allow you to fire quickly with your main gun on the helicopter if it comes within range and remains clear of terrain. On a crossing target, the chance of hitting a fast moving helicopter with one round from the main gun is so slim, and main gun ammo is of such critical importance, that it could be too high a risk to take. However, main gun rounds fired at aircraft that are

hovering or in a shallow dive toward you will have a good probability of destroying the aircraft (depending, of course, on your gunner's ability). Even if you don't hit the helicopter, you will probably "shake him up" severely. Additionally, an upgrade to our main gun ammo is being studied which would provide a proximity-fuzed anti-helicopter round and, possibly, a modified fire-control system for aerial targets.[24]

If the range to the helicopter is in excess of 2,500-2,700 meters, your wisest course of action is not to engage. However, if the Hind is attacking (from a hover or a shallow dive), the TC would probably choose to fire in self-defense. A skilled gunner may hit the helicopter at 3,000 meters, and it takes only 2.2 seconds for a sabot round to travel that far.[25]

If the Hind is relatively near, in a hover facing toward you, or in a shallow dive coming towards your position, then you must act quickly and fire everything you have at the aircraft — main gun, coax, heavy machine guns, and automatic cannon. That Hind is probably about to fire at you — or it may have already fired — and you must disrupt the gunner's aim as much as possible and as quickly as you can. This might mean firing whatever you have in the main gun's breech, but if you're successful, you'll live to fire again. Aim high on the nose of the fuselage for the best ballistic trajectory. Again, the rule to follow is to put a heavy volume of fire in the air. Use a platoon fire command, and if you have sufficient sabot, use it. It's a more accurate round and gets there faster.

If your company team has TOWs with it, they can fire at a HIND too. Of course, the TOW is relatively slow, and this lack of velocity is its major limitation when fired against the Hind. If the pilot observes the launch, he'll probably be able to outrun the missile or outmaneuver it.

Plan artillery fires behind hills and in treelines where enemy helicopters are likely to hide. Use artillery at night also. If you should be attacked by Hinds at night, return the fire, using your tank thermal sight (TTS). You can also fire air burst artillery rounds into the area and mortar flares. Nothing can be so devastating to a helicopter pilot flying at night than an artillery illumination round popping beside him and taking away all his night vision for many minutes.

Summary

The Hind is an extremely formidable foe, and we must take it into account for mission planning. The Hind is faster, more maneuverable, and more agile than our armored vehicles. Its armament has a greater range than our air defense weapons. Additionally, the Hind can carry a squad of air assault troops who can wreak havoc in our rear areas.

However, the Hind is a very large aircraft, and you can see and hear it at considerable distances because of its large rotor and loud engines. Our air defense systems have the capability to destroy the Hind, but as most of us realize, there will be times when the maneuver units must "go it alone." The main rule of thumb in these cases is to put a high volume of fire in the air with every available weapon brought to bear on the target or an aiming point through which the helicopter will pass.

The first step toward winning the tank/IFV-versus-Hind fight is learning the Hind's capabilities and weaknesses; the next step is training. Perhaps the best training available is a Small Arms for Air Defense Range. Contact your divisional air defense battalion for information on these ranges. The professional air defenders of your unit will probably be glad to give you further instructions. You can read about one unit that trained on a similar range as it was reported in the September-October 1985 issue of *ARMOR*.[26]

Footnotes

[1]*Soviet Military Aircraft,* Bill Sweetman, Presidio Press, Novato, CA, p. 134.

[2]*Military Helicopters of the World,* N. Pamar & F.D. Kennedy, Naval Institute Press, Annapolis, MD, p. 135.

[3]Ibid.

[4]"The Soviet Mi-28 Combat Helicopter," W. Cherikov, *International Defense Review,* 10/1984, p. 1457.

[5]Ibid, p. 1455.

[6]*Soviet Helicopters — Design, Development, and Tactics,* J. Everett-Heath, Jane's Publishing Co., 1983, p. 90.

[7]Ibid.

[8]"The Soviet Armed Helicopter Threat," MAJ Richard Armour, *Air Defense Artillery,* Fall 1983, p. 33.

[9]"Helicopter Air Combat," J. Everett-Heath, *International Defense Review,* 5/1983, p. 605.

[10]"Soviet Armed Helicopters," MAJ Henry Shields, *Military Review,* Feb 1984, p. 62.

[11]"UB-16 or UB-32 57mm rocket...," Everett-Heath, pp. 93-94.

[12]Armour, p. 34.

[13]Sweetman, p. 136.

[14]*Red Armor,* R. Simpkin, Brassey's Defence Publishers, 1984, p. 77, and "...at perhaps 150m (500 ft)...," Everett-Heath, p. 95.

[15]"Both TV-2 and TV-3 are...rather heavier and less fuel efficient than comparable Western engines, run at lower temperatures. Exhaust gas temperatures are therefore lower with a consequently reduced IR signature.", *Soviet Helicopters — Design, Development, and Tactics,* p. 91.

[16]Everett-Heath, p. 88.

[17]"Afghanistan 1982, the war continues," D. C. Isby, *International Defense Review,* 11/1982, p. 1526.

[18]"The Transformation of Soviet Frontal Aviation," CPT Greg Parlier, *Air Defense Artillery,* Winter 1984, p. 41.

[19]Everett-Heath, p. 95.

[20]"Fifty percent of all targets *(on the European Battlefield)* are under 1,000 meters, 30 percent between 1,000 and 2,000m, and 20 percent at 3,000m, 8 percent are 3,000-4,000m, 4 percent are 4,000-5,000m, and 5 percent are over 5,000m." "The Modern Battle Tank, Part 2: Firepower," F. Schreir, *International Defense Review,* 1/1972, p. 16.

[21]Parlier, p. 40.

[22]TC 23-44, *Small Arms Air Defense Against Air Attack,* U.S. Army.

[23]For further reading on tank engagements of aircraft see FM 17-12, *Tank Gunnery,* Chapter 16, and TC 17-15-5, *Handbook for the M48A5, M60A1 Tank Platoon,* pp. 144-149.

[24]"Army Develops Five-Part Plan to Meet Air Defense Needs After DIVAD Cancellation, *Aviation Week & Space Technology,* July 7, 1986.

[25]"105mm APDS" — 1,380 m/second, Schreir, p. 16.

[26]"Bradley Gunners Go for the Planes," *ARMOR,* Sep-Oct 1985, p. 51.

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Reducing Track Squeak On Current U.S. Main Battle Tanks

by First Lieutenant Edward Stanley, Mr. David Sass, and Mr. Gary Martin

US Army Photo by SP4 Jane E. Rackley

"Tuning" Centerguides Can Turn Down the Sound of Squeaky Tank Tracks

The Applied Research Branch of the Survivability Division, U.S. Army Tank-Automotive Command (TACOM), RD&E Center has been involved in vehicle signature analysis, including both acoustic and IR, for a number of years. Track squeak was identified as a problem in 1983, and work as an in-house laboratory independent research project began.

The squeak of American tanks has been a characteristic since the early days of the M26[1] in WW II, and still exists on the current models. Besides creating an identifiable signature, this squeak causes pain to unprotected human ears in the immediate area. It is clear that the squeak should be eliminated or reduced.

The initial step in the reduction of the squeak was to locate and identify the source(s). This task was accomplished by using an ordinary tape recorder to record an operating tank. The data was then analyzed with a Hewlett Packard Fourier Analyzer to determine the acoustic characteristics of the vehicle. The squeak was coming from the track centerguides, which are shaped like tuning forks. The roadwheels strike the centerguides as the vehicle moves, causing the centerguides to vibrate, or squeak.

Several methods were tried to detune the centerguides. At first, we thought that a mass attached to one side of the centerguide would be sufficient. It worked quite well as long as the mass was elastically or loosely attached, for example, by attaching a small magnet to one prong end. Rigid attachments,

"...A modification that successfully eliminates the squeak...has been demonstrated at TACOM and was tested at Fort Knox."

FIGURE 1 — A standard centerguide with a small mass welded on.

FIGURES 2 AND 3 — New centerguide designs. Figure 2 is simply a lightened form of the centerguide shown in Figure 3.

where an identical mass was welded on (Fig. 1) were unsatisfactory since the squeak frequency merely changed slightly. Forcing a large block of track pad rubber between the centerguide prongs was extremely effective, but this solution precluded certain necessary periodic maintenance operations. Joining the centerguide prong ends with a metal bar was not successful; there was still some ringing when the new design was struck with a hammer, although the squeak was substantially reduced.

New centerguide designs that did not squeak were available (Figs. 2 and 3). We soon realized that this was the best solution to the problem, as they are much stronger than the current design. The solid, heavier design (Fig. 3) was observed at Ft. Knox, and a cursory check suggested that it was quite satisfactory.

There are several thousand squeaking tanks currently in service, and it seemed that immediately retrofitting a squeak-less centerguide, before the service lives of the current centerguides were up, would be uneconomical. A low cost field modification would be needed to eliminate track squeak as soon as possible.

A modification that successfully eliminates the squeak on the current centerguide has been demonstrated at TACOM and was tested at Ft. Knox. The modification (Fig. 4) is a U-shaped piece of steel with damping pads attached to both outside faces. This damper is bolted to the inside of the centerguide, using the centerguide nut and bolt. The centerguides have a machined area where the nut seats, so a spacer is needed. The spacers (2-SAE 7/8-inch flat washers) prevent the damper from being crushed into the machined area on the centerguide, and form a flat surface for the damper base. The U-shaped damper is formed with the base curved down 1/16-inch in the center, and the prongs parallel to the centerguide teeth. This provides clearance for the damping pads during installation, and initial pressure for the pads against the centerguide prongs, since the base will flatten when the centerguide nut is torqued down. The damper will not allow the use of the large BII socket, but a 1-3/16-inch socket, NSN 5120-00-239-0022, (Fig. 7) 3/4-inch drive, will fit. This socket was used to install (i.e. loosen, then retorque) two complete sets of dampers (320 total) on two tanks.

The damping pads are made of some elastic material, 1/8-inch thick. Highly durable materials are preferred. Slices of track pad rubber and innertube rubber have been used successfully. A hybrid design of 1/16-inch each, with the innertube rubber on the inside of the centerguide, appears to be better. The pads were glued on to the damper metal using an ordinary RTV silicone glue. Dipping the ends of the dampers in Plastisol[3] seems to be just as satisfactory as a single layer of rubber and less susceptible to heat, ozone, ultraviolet radiation, etc.

The dampers were installed by removing the tracks from the tank, removing each centerguide nut,

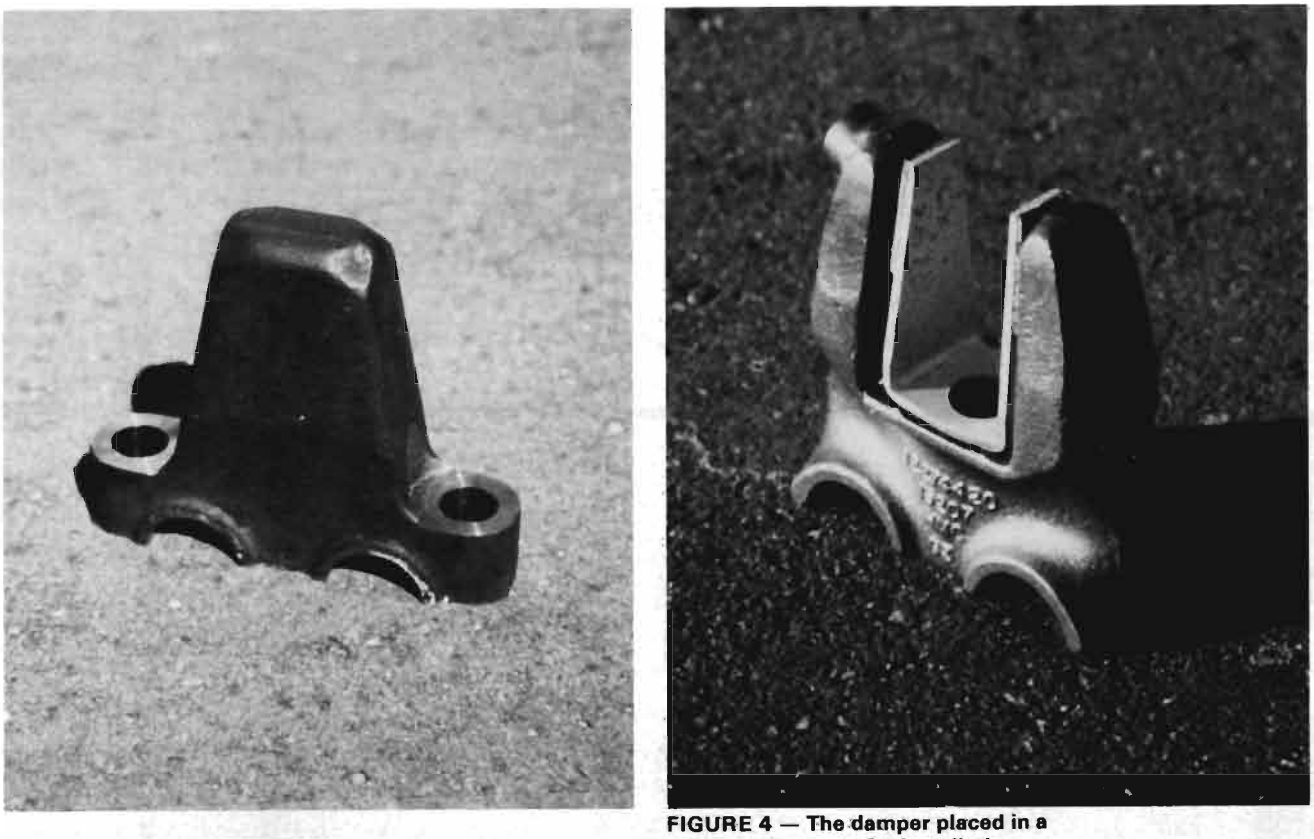

FIGURE 4 — The damper placed in a centerguide, ready for installation

and placing two washers (sometimes one) over the centerguide bolt. Each damper was placed inside its centerguide so that no part could be hit by a roadwheel, even after many miles of wear. The dampers were held to prevent rotation while the centerguide nuts were installed. The procedures took about five hours. At TACOM, the tracks were left on the vehicle and the installation took about ten hours.

Each damper was then tuned for maximum effectiveness. A small hammer was used to strike each centerguide; correct installations had no audible ring. All others were adjusted using a large screwdriver. The screwdriver was used to carefully bend the damper, in small steps, away from the centerguide prongs. The hammer would be used to hit the centerguide; then the screwdriver would be used — either on each side, alternately, or on the side with the most pressure (determined by inspection). After a few cycles, either the ring would be completely or almost completely gone, or it would be as bad as if there was no damper at all. If the ring became louder, an additional layer of rubber would be glued on to the side with the least pressure, and the tuning process resumed. The tuning method was completely successful.

The test at Ft. Knox was partially successful. Initially the squeak disappeared when the tank was driven in a straight line on a hard surface, but returned during turns. A suggestion that the squeak might disappear after the track had "broken in" proved to be basically correct; the centerguide sides were rough with rust, and after a few miles, the centerguide sides were smooth and shiny, and the squeak was no longer audible, even in turns.

A thrown track ended the testing. The throw occurred on a sideslope with the lower track running through 4 to 6 inches of thick mud. An inspection revealed that the cause was a combination of sideslope, unknown track tension, and mud. Sideslope and mud, combined with incorrect track tension, has been known to cause similar failures.

Inspecting the track revealed many things. First, the washers used as spacers had begun to deform. This had caused many centerguides to become loose, which might have caused the loss of the track later (a snap as opposed to an override at the sprocket).

Second, while the dampers that had not been through the mud appeared to be undamaged and working in a satisfactory manner, the thick mud had bent together most of the ends of the dampers on the other side. This might have been due to hydraulic pressure generated as the road wheels rolled past the centerguides, trapping and forcing the mud to escape, at high pressure, through any exit available. The centerguides appear to be near several possible exits. Some of these dampers had been struck by the roadwheels (shiny spots) so there may be other explanations.

Third, and surprisingly, no failures due to heat, sand abrasion, large rocks and other debris, or creep (pad adhesive failures) were

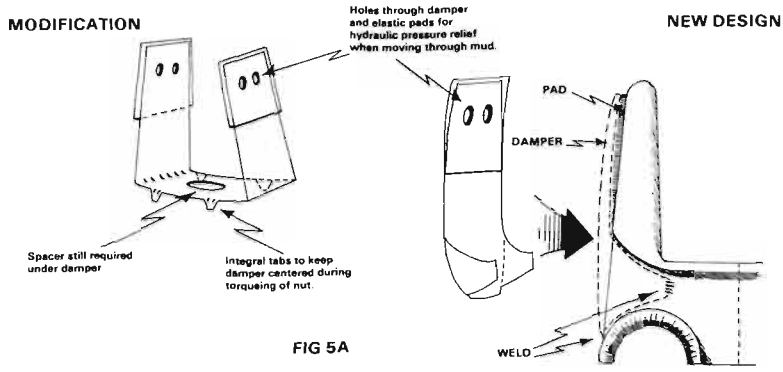

FIG 5A

MATERIAL: Steel, carbon 1010-1015: ASTM A576 or A 108, .12-in thick

Phosphate Coating Type Z Class 2 SPEC DOD P-16232

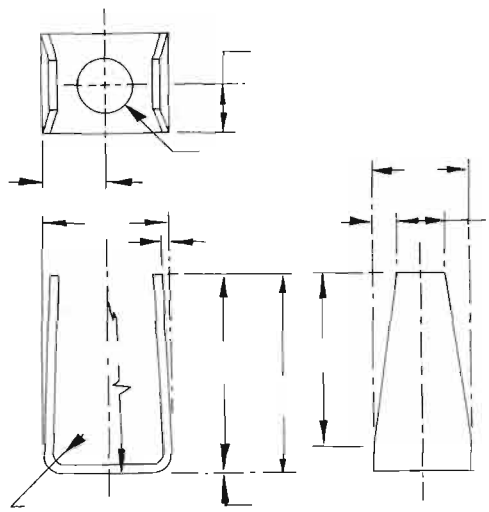

FIG 5B

FIGURE 5 — The original damper design is shown in 5b, while the improved design is above, in Figure 5a.

FIGURE 6 — A damper installed on a tank. The dark areas on the centerguide prongs are where the road wheels make contact with the centerguides. These areas will become shiny after a few miles of movement.

detected. This could be because the test was too short, but given the terrain, it seems unlikely.

The conclusions based on the limited test results are:

- The damper does seem to work as required, but a redesign (Fig. 5a) should be better, as welding two dampers on each centerguide would be easier to maintain, and would avoid using the centerguide nut and bolt.
- Higher quality steel is necessary for the damper. This would allow the current damper design to work as predicted, but a new socket like the one in Fig. 7 would be needed because of size limits between the centerguide prongs. The new design (Fig. 5a), made of higher quality steel, should be satisfactory. Currently, it appears that a steel with yield strength of at least 150,000 psi should be sufficient, and a 4000-series steel should be used (e.g. 4130). This, of course, increases the cost.
- Third, damper pad life doesn't appear to be a problem, but this may be settled with further testing.

At this point, it seems that the new centerguide designs (Figs. 2 and 3) are the best solutions to the problem. They are stronger, do not squeak, and the one shown in Fig. 2 weighs about the same as the current design. Best of all, it appears that they will cost about the same as the current design. The extra nut and bolt seems a trivial price to pay, in terms of a greater logistical burden (more parts for each tank) for increased strength and decreased detectability.

We would like to express our thanks to the people whose assistance made this project possible. The people in the fabrication division at TACOM built the prototype damper and provided advice and access to tools for installation. Mr. Sam Letman at the tire lab provided track rubber samples, advice, and an oven for production of Plastisol-coated dampers. Finally, we appreciate the work done by the maintenance operations procedures shop of the Maintenance Directorate at TACOM, the people at the Armor

"...Damper pad life doesn't appear to be a problem but this may be settled with further testing."

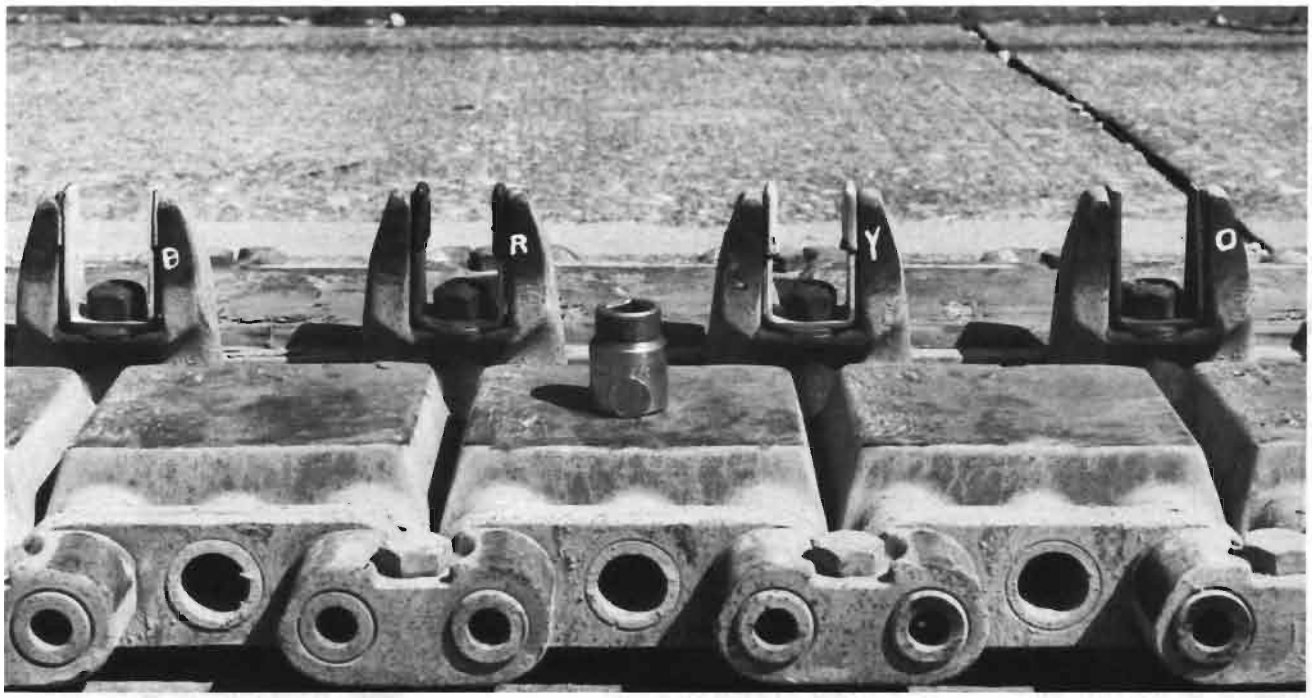

FIGURE 7 — The socket used for the installation of the dampers is on the track block. This socket, NSN 5120-00-239-0022, is a tight fit once the dampers are installed.

and Engineer Board, and the soldiers from H Company and M Company of the 2/6th Cavalry at Ft. Knox, who installed the dampers on the tanks and ran the field tests. Without their help, advice, and work, this project would never have been possible.

Footnotes

[1]Earlier tanks also squeaked, but this article is concerned only with tanks fitted with the centerguide type shown in Fig. 1. A picture, apparently of 1943 vintage, of a T-23 fitted with a double-pin track with the two-prong centerguide can be seen in Hunnicutt, R.P., *Pershing: A History of the Medium Tank T-20 Series,* 1971, Feist Publications, p. 88.

[2]See Graziano, James M., Grant R. Gerhart, and Thomas R. Norris, "Acoustic Signature Reduction of Track Squeak."

[3]Plastisol is a trade name for a rubber-like compound that is in liquid form and must be heated in order to harden. It is used for many things, such as coating bare metal tool handles to form a cushioned, non-slip grip, and as the construction material for certain types of overboots.

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Random Recollections

The Gafsa Girls

by Lieutenant General Samuel L. Myers (Ret.)

All war is not, as General Sherman said, hell. All war is not death, disaster, blood and fire, despite what many journalists and historians are apt to depict. All war is not misery, discomfort, dirt, suffering, and confusion, as a great many of those who participated are apt to say. I have experienced all of this, but I prefer to talk of more pleasant things. There were many — even in WW II — and such pleasant things will be the gist of the tale which follows.

I landed at Mers el Kebir in North Africa, on the 12th of November, 1942, with a portion of the II Corps Headquarters. As we disembarked from the ship Monterey — which had brought us, almost uneventfully, from Grennoch, Scotland — there was firing of sorts going on all around us, but strange to say, we were left alone, and alone we were indeed, without even a single vehicle.

So our more than 100 staff officers started their first approach to battle by having to walk, from Mers el Kebir to Oran, overloaded with junk, without full canteens, and with no guides. Our first war casualties were blistered feet and most of our superfluous luggage.

My position in II Corps Headquarters was Automotive Officer. I don't believe that slot exists today, but in 1942, when I was trained at Fort Holabird for this duty, the newly motorized U.S. Army was tearing vehicles up faster than industry could build them. There was great need for my expertise, coupled with strong command backing.

On December 21, 1942, Colonel John Dabney, Chief of Staff of II Corps, called me into his office and told me the old man, General Lloyd R. Fredendall, had a most unusual job for me. In the General's office, I was told that sometime in the very near future, II Corps would be going into battle in Tunisia, or Eastern Algeria, between Tebessa and Gafsa. At present, the only known combat troops in that area were French, plus one American paratroop battalion and a few unknown British troops. They then told me to choose 15 officers and 25 enlisted men from the headquarters — mostly technical service personnel — but also some line officers because we might have to defend ourselves.

My yet-unnamed task force was ordered to leave about the 6th of January, 1943, go to Tebessa, and there establish a general depot to supply II Corps when it arrived. Natousa, North African Theatre of Operations, together with the First British Army, would be responsible for forwarding the supplies to me via the narrow-gauge railway from Ouled Rhamoun, or by truck, or by both.

For the time being, I would operate with only verbal orders. I mention this because absence of written orders caused some sticky situations later.

Following the conference with General Fredendall and John Dabney, I went to the adjutant general where, by phone with the section chiefs, I picked 15 officers and left it up to them to choose two enlisted men each. The adjutant general was then to issue travel orders, while I went about further preparations.

On the 23d of December, I flew from La Senia, South of Oran, to Algiers, and headquarters of Natousa, where I was further briefed by the G-4, who I think was Brigadier General Tom Larkin.

I must say here that most of this article will have to be from my memory. (Several years ago the Army Historical Office asked me to send my papers and records to them for storage. I can no longer go all the way to Carlisle, Pennsylvania, to study my own papers.)

At Algiers, where I stayed about 36 hours, I was given additional orders, verbal, and a considerably enlarged mission. I'll not go into the details, since detail will develop as we go along, but I will mention one item of utmost importance: I

was told that enroute to my ultimate destination, I would stop at Constantine and report to the First British Army for more instructions and more detailed orders. This completed, I flew by Army aircraft back to La Senia and Oran, arriving on Christmas Eve.

The day after Christmas, I met with the group which was to accompany me and briefed them as best I could. John Dabney said that we could leave about January 6, and so we started to get ready.

On the 29th of December, radio orders form Algiers desired that I be on the way at once. I told the senior officer of my as-yet-unnamed command to bring them along as soon as possible and to meet me in Constantine for the move to Tebessa. In my little, captured Fiat pickup, with Sergent Morvey as driver, we were loaded to move out alone on December 30th. At this time, Colonel Andrew T. McNamara, a West Point classmate of mine who was II Corps Quartermaster, volunteered to go with me. I never did know whether he had permission from either Colonel Adcock, the G-4, or the chief of staff, but he went.

At midnight of December 31st/January 1st (1942/1943), we were atop the last range of the Atlas Mountains before descending into Algiers. We warmed up some C rations on the manifold of the Fiat, opened a bottle of Algerian Vin Rouge, and properly celebrated the opening of what turned out to be a very momentous 1943. Then we went on into Algiers, only to find that no one there worked on New Year's Day but the duty officer. So we, too, rested.

On January 2d, I was summoned to both G-4 and G-3 offices, where my mission was considerably broadened. The most significant part was that I was to proceed at once to Constantine and report to headquarters, First British Army, to which I was to be attached — this was a new condition — until the II Corps arrived in the Tebessa area.

On January 3d, we went to Constantine and reported. After being shuttled about a bit, I wound up in the office of DS&T, which means, I think, Director of Supply and Transport. A gentlemen named Brigadier Hinds welcomed me, in a very reserved manner, and turned me over to one Colonel Gordon-Smith who clued me in, not only of what was expected of me, but how the British Army operated. The only thing specific was that my group was now to be a command called Number Two L of C — Line of Communications. Less specific was that I would (take over) all troops — French, English, and American — that I found in my area. My area extended from Kairouan in the northeast to Metlaoui in the southwest. I would handle all supplies, incoming and outgoing, and — here was a new wrinkle for an American — *be responsible* for the *safety* of *all formations* and *establishments* in the area. All this with no written orders!

On the 6th or 7th of January, the rest of my crew from II Corps arrived, and together we headed south for Tebessa. Although all hands were expecting air attacks along the way, and fingers were on triggers constantly, nothing happened. We arrived at Tebessa at about 4 p.m., where we were met by Major Christiensen, the British Town Major, who reported very formally. With him was the French Commissionaire of Police, who appeared unhappy to see us. Major Christiensen at once requisitioned a house for us as a CP, and we moved in. Sergeant Morvey and some of the other men were in the kitchen warming C rations. Three or four officers of my group — I remember especially Major McNally and Captain Wing, as well as two British officers — were just sampling some of the British, most-welcomed scotch, when a group of British antiaircraft guns, which were all around us, cut loose. Then came a bomb at a rather close distance, and then another that hit the house next door, demolishing it. At the same time, it knocked the upper part of our house off and showered us — now on the floor, on our bellies — with lath and plaster. When quiet resumed, we all got up, dusted ourselves off, and then it was noticed that I still had my thumb on the bottle of scotch, and not a drop had been spilled.

Later, I was decorated by the British Government with the Order of the British Empire. Many people have attributed this medal to the coolness I displayed under fire for the first time by not spilling any scotch.

"...Many people have attributed this medal to the coolness I displayed under fire... by not spilling any scotch..."

The next morning, I sent Morgan Wing out to find us a better CP. On his return, he reported that for ten dollars he had purchased an Arab shack outside of town by the racetrack. We moved at once, using the racetrack stands for a CP and the shack for our boudoir. That's how we acquired our new and more commonly used title, "The Race Track Gang."

Business picked up at once. Soon Tebessa was bustling. Our supplies were soon measured in thousands of tons and millions of gallons. We had established sub depots at Gafsa, Sebeitla, and Ferriana, with a small mobile unit on rail and truck at Kasserine. The troop list grew like Topsy.

Although my purpose in this article is not to measure the enormity of our task, I must give some examples of the conglomerate nature of the command. We had a British antiaircraft battalion, commanded by a Major Sim — a Scot whose accent was so burred one could cut it off in pieces. There was a British MP company; a rail transportation company; a troop of the Derbyshire Yeomanry, a reconnaissance unit; two heavy truck companies; a squadron of the Dieuxieme Spahis D' Afrique horse cavalry, without horses; a battalion of Senegalese infantry; and, several ragtag, indiscriminate groups who worked to eat.

None of the French had been paid for months. Our rations, uniforms, vehicles and ammunition were all they had to keep them going. I could make a book of the unusual and astounding things that took place in Number Two L of C, but for this article I must confine myself to one small feature which is unknown in the U.S. Army — or the British Army for that matter.

In Tebessa, there was a "maison de plaisir." How I love that title and not at all like the grating words we are accustomed to using. This type of institution was found in nearly all towns garrisoned by French soldiers. Soon after our arrival the Town Major said to me that he was having trouble maintaining order in the maison de plaisir, and asked if I would help him out.

"Sure," said I. I had in my staff a lieutenant colonel doctor named Norman Wiley. He had, after defleaing our residence, little to do, so I made him Master of the Maison de Plaisir. Soon it was a model of discipline and HEALTH. There was nothing in the entire area which could cope with its popularity. Peace, in a polyglot wartime mixture, reigned supreme.

Ninety miles to the south of Gafsa, there was another such establishment. It, too, was popular, especially with troops of the US 1st Division and the US 34th Division, which were located near Gafsa. The Town Major, Lieutenant Colonel Albert Jean Lebel, a French officer, was very happy too.

Then came the three-pronged assault through the Eastern Cordillera by Rommel's forces. This assault, which has subsequently been given the all-encompassing title of the "Battle of Kasserine Pass," was swift, fierce, and devastating. Before we knew it, Germans and Italians were within artillery range of Gafsa, where we had two thousand tons of ammunition and over a million gallons of fuel. This we must save, and by herculean efforts — by truck, train, and even wagons — we got all the fuel and all the ammo out. As the last truck of ammo, driven by a black soldier of the 28th Quartermaster Truck Regiment, went by the Gafsa Maison de Plaisir, out rushed the madam and the eight girls, who begged to be saved from the Boche. The driver loaded them on top of the ammo

and brought them back to Tebessa. My first knowledge of this arrival was from a very irate Commissionaire de Police, who expressed himself, in no uncertain terms, that he wanted no more whores in Tebessa.

I told the Commissionaire of Police that this problem was not really a great problem in the US Army, as we encountered things like this every day, that we would soon have it put in order, and for him to stop worrying. I also buttered him up a little bit by giving him a case of C rations, which, at that time, were just about as valuable as a case of gold. He went happily on his way.

I sent for Doc Wiley and said, "Doc, you've got another little group on your hands now. You're the master of two maisons de plaisir. So, let's see how you can work it out without causing a complete disintegration of order in Tebessa."

Doc went to work at once and proved beyond a shadow of doubt that not only was he a good officer and a good doctor, but he also possessed the utmost diplomatic capability that one could imagine. He took the house where the Tebessa madam and her girls were living and he put a partition right square down the middle of the house. In the hallway, at one side of the entrance, he put a little ticket booth and installed the madam from Tebessa. On the other side, he put another ticket booth and installed the madam from Gafsa. Since it was a large house, there was plenty of room for all the girls, especially since he, somewhere or other, had scrounged a Nissan hut or two and set them up out in the back garden. Life proceeded with the greatest of tranquility that could be imagined in that particular area. Soon, the Germans had shot their wad, so to speak, and withdrew.

Then, of course, as the American Army followed their withdrawal, we soon had Gafsa back in our hands. As a matter of fact, II Corps Headquarters moved to Gafsa and set up there. No sooner had this been accomplished than the madam from Gafsa came to see me and said that her girls now were very homesick for Gafsa and wanted to go back to Gafsa as quickly as possible, and would I send them back. I said, "Of course, we'll send you back. We have no reason to keep you here, now that Gafsa is secure and in our hands." So, being a sentimental soul, I ordered a truck to be loaded with ammunition, just as it had come out of Gafsa, and on a given day, I loaded all the girls on top of that truck of ammunition,

"...The Tunisian border guards would not let the girls come back into Tunisia without a release order..."

driven by another soldier from the 28th Quartermaster Regiment, and started them down the road toward Gafsa.

Also, since my sentimentality extends sometimes to quite considerable extremes, I called up the headquarters commandant of II Corps, Colonel Harry Goslee, and asked him to plese send the corps band out to meet the girls at the outskirts of Gafsa and play them in when they came back. And I called my good friend, Colonel Red Cooper, who was provost marhsal of II Corps, and said, "Red, how about sending out a detachment of military police to escort the girls in when they reach Gafsa."

And Red said, "That's a good idea. We'll do that for sure."

And then I said to my staff, "I think I'll go to Gafsa myself and see how this operation takes place." But I hadn't gone very far when I got word that the girls had run into trouble at Bou Chebka, which was the border crossing point between Algeria and Tunisia. The trouble they encountered was that the Tunisian border guards would not let the girls come back into Tunisia without a release order from the Governor of Algeria.

Word of this minor problem reached me by radio as I was driving south in my jeep. I had only gone about 15 or 20 miles below Tebessa, so I turned around and went right back immediately. I got together a little group — with tentage, cooking equipment, and rations — and sent them down to Bou Chebka to set up a camp for the girls at Bou Chebka until we could take action to get them cleared to go back to Tunisia.

After studying the problem a little bit, I sent Major Ray McNally up to Youks le Baines, where there was an air station now, and asked the Air Corps people if they would fly him back to Algiers, and to get the permission from the Governor necessary for this act to take place.

Incidentally — and this is a side issue — at this same time there had come directly from General Patton, who was in command — that we produce immediately a pair of size 14 EEEE boots for a soldier who had enormous feet. Of course, the Army didn't stock anything like that. So, McNally had that mission going back to Algiers at the same time he was trying to get the clearance for the girls.

Anyway, to continue with the story, he did get to see the Governor of Algiers, and he did get permission for them to go on into Tunisia, and he came back, and we started the exercise moving again with exactly the same plans that we had before. This time I went to Bou Chebka when the truckload of girls and ammunition moved out, and stayed with them until we got to the outskirts of Gafsa.

There, very much to my surprise, instead of being met by the band from II Corps and the platoon of military police, I was met by Colonel Damon Gunn, who had now been designated as the Town Major of Gafsa. Well, I knew Colonel Gunn pretty well because, years before at Camp Perry, when we had been shooting in the National Matches, he was a member of the Infantry rifle team at the same time I was a member of the Cavalry rifle team. So, I went right over to where

he was and said, "What's going on, Damon. What's happened?"

He said, "You can't send those blankety-blank girls back into Gafsa. I don't want any such thing as that down here in this town!"

I said, "Well, we've got to put them somewhere. We can't keep them as people without countries forever. We must do something with them." Well, we argued back and forth and finally we arrived at a compromise. It was a real killer-diller of a compromise. I didn't like it a bit, but he had his way. Of course, since he owned Gafsa at that time, and he had General Patton to back him up, he said the girls could come into Gafsa on one condition and one only: That they discontinue the practices which they have been conducting all the time in Gafsa previously; that they will now go to work for the US Army as washerwomen.

"I'll get them tubs and scrub boards and soap, and whatever, and the soldiers can bring their laundry in to this place, and the girls can wash it for them. Under those conditions, they can proceed."

Well, he had me over a barrel and there was nothing else to do, so I told them to go on and agreed to those circumstances.

About two weeks later, I sort of got curious as to how this situation was working out, and since I had business in Gafsa, I drove down there one fine day and went into headquarters and checked in with a few people whom I had to talk to, and got a few instructions about what I was supposed to do in the not too distant future. Then I went over to the old Maison de Plaisir to see how it was working.

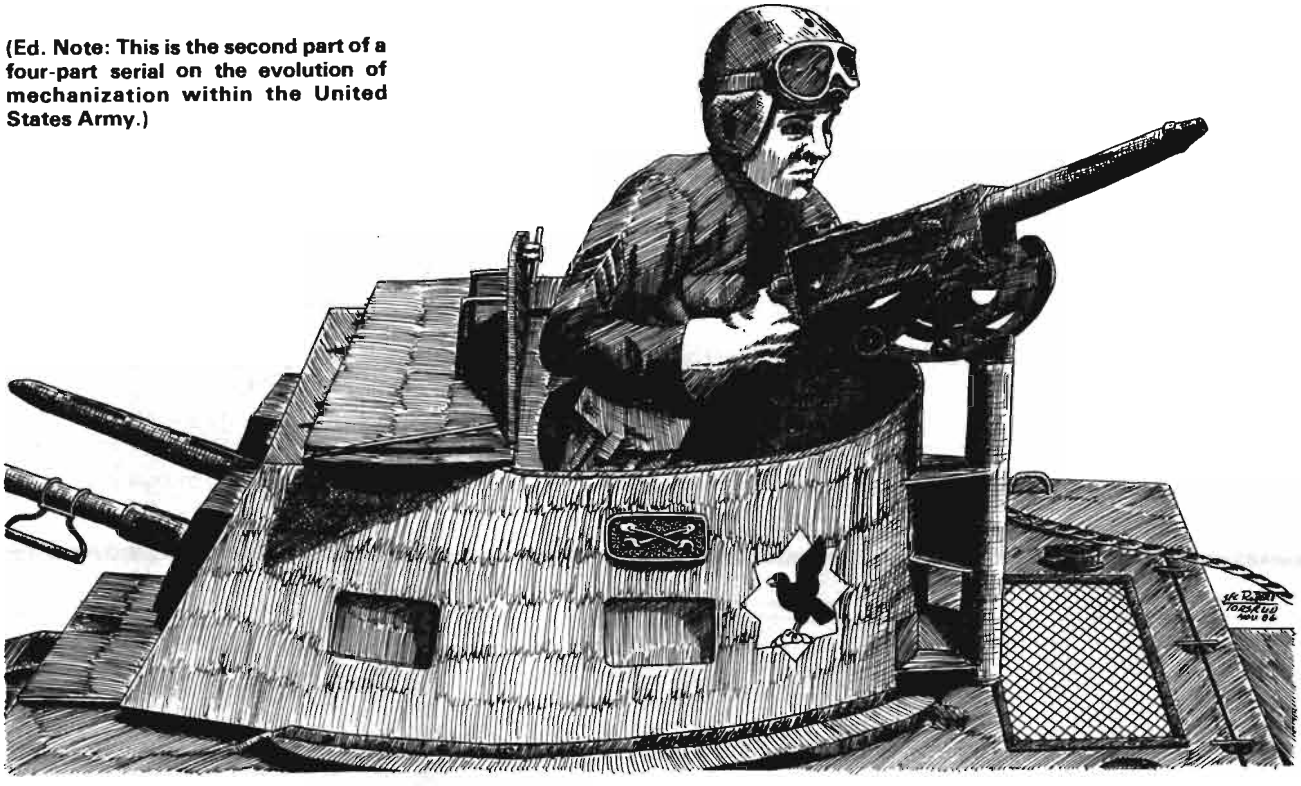
As I walked in the door, the Madam greeted me effusively, because she remembered how well she had been treated in Tebessa. She said, "Come, I will show you our operation now." So she took me out into the backyard of this house and there were wash tubs on benches all over, and clothes lines strung up, and clothes were drying and girls were scrubbing, and so forth and so on. Everything looked like a perfect setup for complying with Colonel Gunn's orders.

But she said, with a little bit of a twinkle in her eye, "Mon Colonel, suivez moi." She went clear to the back of the garden. There had been a wall built there out of mud bricks, and there was a little doorway through that wall, through which we went; and, there was a whole row of nice, newly built, mud houses. In those mud houses, the girls who were not busy washing were busily engaged carrying on their profession, just as routinely as it had always been done. I think that this condition continued until II Corps moved out of Gafsa and went North to Beja. After II Corps moved out, and I was sent to Gafsa to take charge down there — and to "tidy up" the battlefield, as the British put it — they were still performing in that manner. And there you have the tale of the Gafsa Girls.

"...Then I went over to the Maison de Plaisir to see how it was working..."

LIEUTENANT GENERAL SAMUEL L. MYERS, retired in 1963 after serving as deputy CG, Eighth Army. He served as a cavalry officer in Texas and Kansas after commissioning from West Point in 1928, and with the 26th Cavalry in the Philippines in the late 1930s. During his long and distinguished career, he also commanded the Armor Training Center at Fort Knox.

(Ed. Note: This is the second part of a four-part serial on the evolution of mechanization within the United States Army.)



The Ten Lean Years

From the Mechanized Force (1930) To the Armored Force (1940)

by Major General Robert W. Grow, USA, Retired

(Part 2 of 4)

On 1 November 1931, at Fort Eustis, Virginia, a unit designated as "Detachment for Mechanized Cavalry Regiment" was organized out of portions of the disbanded Mechanized Force. It consisted of the Headquarters and Headquarters Detachment and the Armored Car Troop (Trp A, 2d AC Sqdn). Attached were Company C, 13th Engineers; the 19th Ordnance Company; and the 28th Motor Repair Section. At 0515 hours on 2 November 1931, the unit began its four-day march to Camp Knox. The march and the unit's proposed future are summarized in these extracts from the Louisville *Courier-Journal*, dated 5 November 1931:

> A mechanized troop of 400 officers and men reached Camp Knox for permanent station after a 750-mile, four-day move from Fort Eustis, Va...Throughout the transfer, the armored car troops were forced to make special halts to allow the slower baggage vehicles to catch up. A total of 170 assorted transport and fighting vehicles were in the column...Seventeen motorcycles, two of which were kept at Colonel Van Voorhis' disposal, buzzed up and down, coordinating the movement...The troops will form the nucleus of a mechanized cavalry regiment which will be formed at Camp Knox. It will be the first regiment of its kind in the American Army. It is called cavalry...because it is designed to take over the cavalry role, the characteristics of cavalry being mobility and shock action. The horse has not lost his place of usefulness in the military service, ranking officers with the column said, although the situations in which the horse's vulnerability makes him unsuitable are increasing.

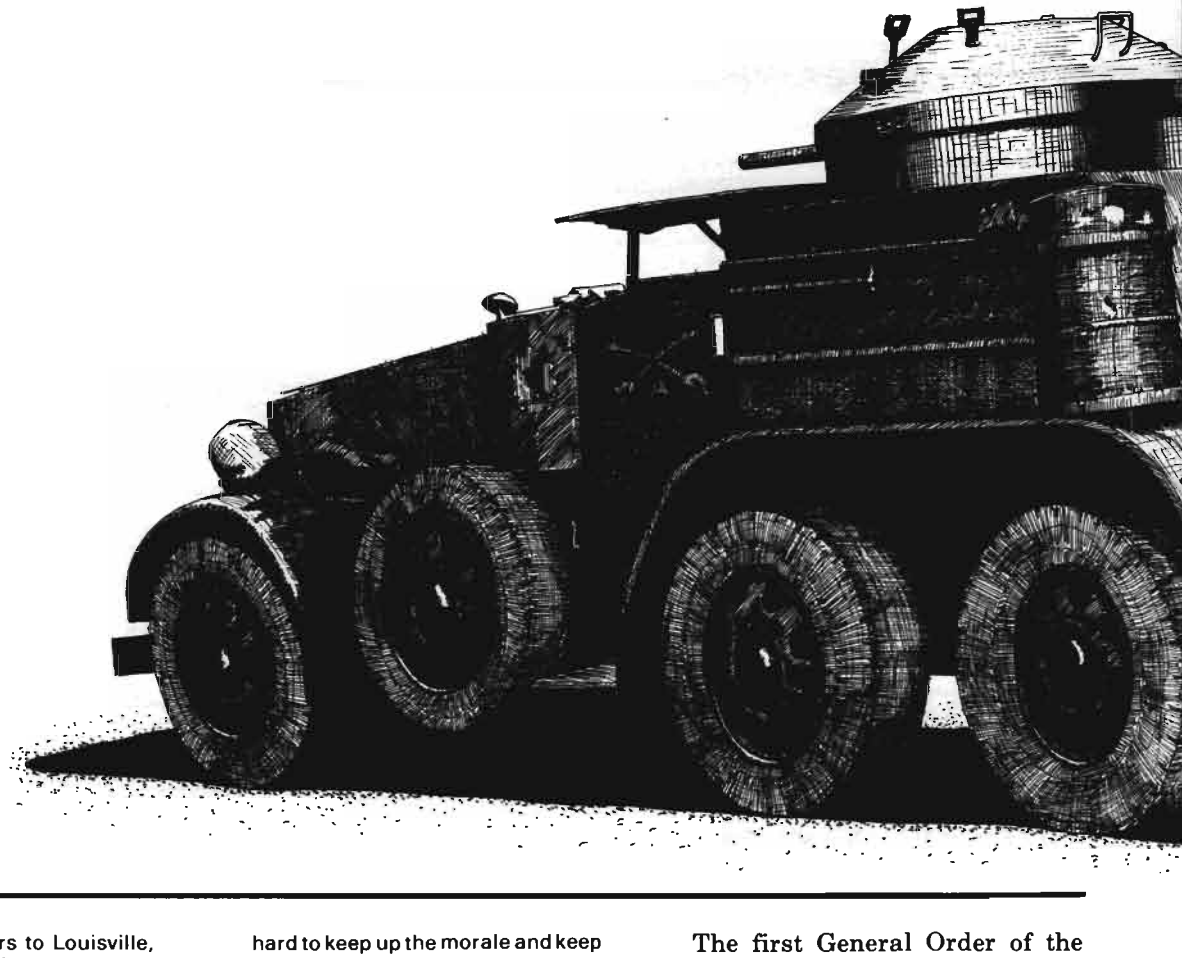
Arriving at Fort Knox on 5 November, the Detachment began to settle into its new surroundings.

Life at Knox

Camp Knox, at this time, possessed no permanent military housing. When the War Department acquired the 33,000-odd acres during WWI, the village of Stithton was included and approximately fifty private homes in the original setting had been maintained. They were used as officer and senior noncommissioned officer quarters for caretaking and summer training camp personnel. WWI troop barracks, warehousing, and a few shops were maintained, and a large club house, known as the Central Mess, completed the major facilities that we found.

November was devoted to getting settled and planning, as well as it could be done under the uncertain circumstances. My diary reports:

> 6 Nov. Conference on temporary settling of barracks area; talked over quarters with Chaffee and Hazlett.
>
> 9 Nov. On a board with Bermel and Johnson to recommend type and location of garages...plan(ed) an Armistice Day parade in Louisville. Armored cars only will take part.



16 Nov. All officers to Louisville, guests of Board of Trade. In his speech, Van Voorhis said that he expected both the 1st and 4th Cavalry to come here. Don't know where he gets his information.

19 Nov. Letter from the Chief of Cavalry for probable number of hours various vehicles would be used next year. I made tentative training program.

20 Nov. Board meeting to recommend vehicle marking. License plates front and rear and cross sabers on side in yellow. Van Voorhis much discouraged over prospects for a regiment...

22 Nov. We got word the 1st Cav. would not come until May or June. What the War Department expects us to do in the meantime no one seems to know. Worked on new training program based on regiment's arrival in June. Revising TO&E for regiment, saving as many mechanics as possible to organize a maintenance platoon.

28 Nov. Ground clearing. Takes lots of rock.

1 Dec. Construction on garages started.

22 Dec. The air seems charged with a feeling of restlessness due to the long period of fatigue and the feeling that there will be no military training this winter. It is going to be hard to keep up the morale and keep busy.

Lacking a cavalry regiment to convert, the Detachment kept itself busy building facilities at Camp Knox.

The routine in December and January was much the same. One of the more favorable forecasts appeared in the *Courier-Journal* on 13 December 1931:

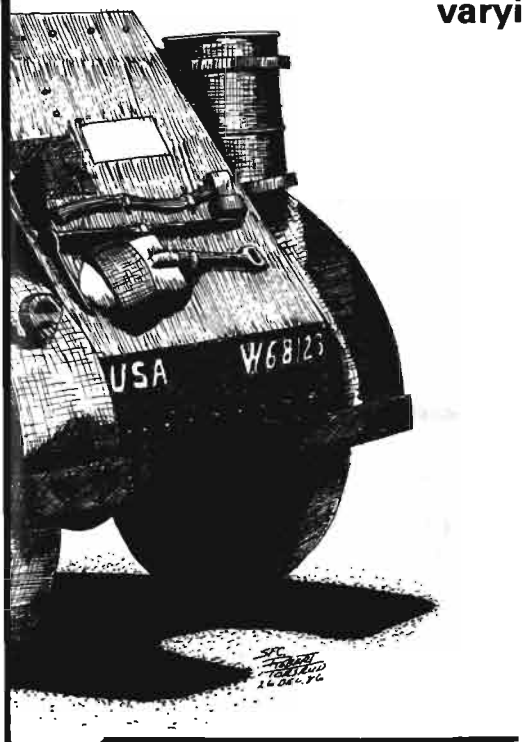
> Building programs for the new permanent garrison at Camp Henry Knox called for expenditure of $10,000,000...the actual building may not be started for two years.

The article also described the proposed two-battalion barracks on 7th Avenue, administration building, theater, exchange, gymnasium, post office, library, 19 single sets of officers quarters, 36 double sets for officers, 29 double sets for warrant officers and noncommissioned officers, a 100-bed hospital, guardhouse, fire station, laundry, utility shops, schoolhouse, quartermaster administrative building and barracks, seven garages, maintenance shop, and enlisted service club. These plans were followed to a large extent two years later when permanent construction eventually got under way.

The first General Order of the War Department in 1932 changed the name of Camp Henry Knox to Fort Knox. On 12 January, money problems took on a personal vein with a stunning blow — especially to the officers — when the Union Bank of Stithton closed due to the embezzlement of some $40,000 by the late cashier, Mr. Yates. All troop funds, post exchange funds, and many officers' personal accounts were kept there.

On 17 January 1932, we learned that Brigadier General Julian R. Lindsey, who had just received his star, was ordered to Fort Knox. On 19 January the *Courier-Journal* reported that the 1st Cavalry would be mechanized at Fort Knox in May and that "an entirely new military unit to be known as the 7th Cavalry Brigade (Mechanized) was organized and expected to be eventually consolidated with Fort Knox as its base...the brigade is to be comprised of the 1st and 4th cavalry regiments and a headquarters and headquarters troop." *[Ed. Note: The brigade was eventually formed with the 1st and 13th Cavalry Regiments.]* On the 29th of January, we learned that the Chief of Cavalry had approved the TO&E that we

"We now had organized combat car and maintenance platoons and held daily drills, including radio, with varying results..."



had drafted. The occurrence was much more favorable than I had expected.

For several weeks we had been negotiating with Kentucky authorities to secure recognition of Fort Knox license plates for our private cars. On 31 January, I saw the chiefs of both city (Louisville) and county police who agreed to recognize Knox licenses until a decision was reached by the state. This decision was later confirmed, and Fort Knox plates were made valid through 1934. The basis of our argument was that since Kentucky would not contribute to our school, we should be able to sell our own plates and use the revenue to help support our "independent" school.

New Organization, Equipment, Doctrine

General Lindsey arrived on 6 February 1932, escorted in from Muldraugh by the armored car troop. He confirmed the orders for the 7th Cavalry Brigade with an inactive Headquarters and Headquarters Troop and the 1st and 4th Cavalry Regiments. On 18 February, Lindsey talked to Van Voorhis, Chaffee, and me about the mechanized brigade. He had become convinced that attached artillery was necessary. This brought in other things — chemical, ordnance, and motor-repair units. In the end, he told me to prepare a TO&E for a mechanized brigade with these units included. I expressed my feelings in my diary: "Can't see where it will get anywhere. It will be similar to what we set up last July (at Eustis) and which was turned down cold by Moseley."

A small stable had been maintained on the post for years and I was able to explore the reservation on a horse during the winter. I felt the area was unsuitable for wheeled vehicles, but it was excellent for tracks. I recorded the following entry in my diary:

> On 1 March, rode with Edwards and radio crew in Franklin radio truck to NE section of the reservation. Steep hills, poor roads, mostly wooded, beautiful horse country but impassable for our stuff. Radio fair. As usual, it leaves much to be desired, a heartbreaking job.

The next day, the 2nd of March, Van Voorhis told me that the 1st Cavalry would not move prior to 1 January 1933. I felt that it was a fine mess for 30 officers to be here in the summer with nothing to do. (It turned out that we had plenty to do). I commented in my diary, "I am not surprised, but I think Cavalry has made a terrible mess."

Rumors were rife all spring. On 9 March, Van Voorhis told me that he had word that Moseley in Washington said the 1st Cavalry would certainly not come this year. I felt that we would end up at Fort Riley, or possibly the 13th Cavalry would come to Knox. On 12 March we received a letter from the Chief of Cavalry which enclosed printed TO&Es which he was recommending to the G-3. They included all the important changes that I had put in the draft that we had forwarded on 20 January, so I was delighted. Still later in the month, another rumor surfaced when Van Voorhis told me that Chaffee, on a trip to Washington, reported that the G-3 recommended that the 8th Cavalry come to Fort Knox. At the end of March, we heard privately that the 8th Cavalry definitely was not coming and that there was nothing in sight for us.

On 17 March 1932, Lindsey finally sent in his recommendations for a mechanized cavalry brigade, but he got tangled up and asked for motorized instead of mechanized field artillery. This disappointed Van Voorhis and Chaffee, but the latter said nothing could be done about it as Lindsey was set on motorization. *[Ed. Note: "Mechanized" field artillery would be self-propelled. "Motorized" field artillery would be towed.]* Later in the month, we received a Cavalry School memorandum on mechanized cavalry. After discussing it with Colonel Van Voorhis, I noted that it did not visualize the employment of the regiment as a whole, but dissected it and used the parts to assist horse cavalry. Van Voorhis was upset by people writing regulations for the mechanized brigade who knew nothing about the subject.

We now had organized combat car and maintenance platoons and held daily drills, including radio, with varying results, but we gained good experience. A schedule of command post exercises (CPXs) was set up partly to justify the retention of the attached Signal Corps personnel. Every day was a testing day for equipment. Van Voorhis and I disagreed on what kind of combat car we needed. I wanted lots of light ones, since I was afraid we would never have enough. Vehicle life would be too short in combat, and I felt we would need tremendous reserves. Van Voorhis wanted fewer and bigger machines. Ford and Chevrolet engineers paid us a number of visits to study what we needed and explain to us what they were engineering and developing.

Defense Day was 6 April, and we paraded a detachment of 40 vehicles through Louisville. Everything hit perfectly. The *Courier-Journal* reported.

> Interest was centered on the new Christie tank, the only machine of its kind in existence. This heavily armored tank, bristling with offen-

> sive and defensive weapons, has proved capable of average motor speed over roadless ground...[It] was followed by a number of lighter armored cars, all heavily armed with machine guns and protected by steel armor.

The only trouble was slow pace, as we followed the band at two and one-half miles per hour!

The Chief Signal Officer, Major General Irvin Carr, visited Fort Knox on 15 April and was briefed on our needs. He expressed full cooperation and indicated that the Signal Corps personnel would remain with us. The next visitor was General Drum, who told the officers that we could not expect a cavalry regiment before next spring, but that it was sure to come. We gave him a demonstration of combat car action which included stalled Christies at the start, due to weak electric systems. A Christie engineer came to Fort Knox following a visit to Fort Benning, Georgia, where the infantry had unloaded many of their troubles on him. He received our recommendations and accompanied us on a CPX, driving the only Christie that was running. The exercise on parallel roads south beyond the Green River went very well. We also made back-and-forth visits to the Cummins diesel plant at Columbus, which gave us a good idea of what the diesel engine was like.

We were putting a great deal of thought into the development of doctrine. An entry from my diary on 6 May 1932 is representative:

> Fixed up details for tomorrow's CPX. The problem of independent operation under corps or attachment to a division comes up; Van Voorhis is much concerned about any attachment to a division. I think it OK for a regiment but not for a mechanized brigade.

Reporting the results of the CPX, I noted:

> Cool and cloudy. Had two Christies along to try them out on dirt roads and changing to tracks and back to wheels. Very successful day. Radio very good. Route: Leitchfield-Harned-Brandenburg-Vine Grove.

Given our lack of a cavalry regiment to train with, we made maximum use of these exercises to develop the doctrine which we would try out when the mechanized cavalry regiment was fully formed.

With the increasing use of vehicles, the maintenance problems mounted. We had many discussions concerning the responsibilities of second- and third-echelon maintenance and their personnel and equipment requirements. I noted in my diary that "We have no sound policy." With the Ordnance Department responsible for combat vehicles and the Quartermaster Corps for the others and our own maintenance platoon building up a stock of immobile shop equipment, complications arose but gradually policies emerged. Among other things, I was working on ammunition allowances for 1934, which required a bit of imagination, but the Chief needs them.

The Last Days of the Detachment

During June, we put on a number of demonstrations for the 10th Brigade, which was at Fort Knox for summer training. The fourth and final Christie was delivered. Joe Holly and Dave Barr, outstanding infantry officers who later became prominent in the Armored Force, were reassigned, and Captain Edwards, our signal officer, was sent to Fort Monmouth, New Jersey, to work on mechanized radio. The Chief of Cavalry, Major General Guy V. Henry, visited Fort Knox on 13 June and informed us that a new organization — Detachment, 1st Cavalry (Mechanized) — would go into effect on 1 July 1932. The War Department plan arrived a few days later, and we started making up TO&Es to send to V Corps, which was charged with organizing the unit.

The last days of the Detachment for Mechanized Cavalry Regiment were busy ones, with demonstrations for ROTC, ORC, and Boy Scouts, studies, reports, recommendations, and reorganization. The Detachment, created on 1 November 1931, had existed for eight months. Considering the problems incident to rehabilitation of a new post, development of organizational and tactical doctrine and equipment, plus the uncertainty of future status, the results were truly amazing. The impressions made on the War Department and all military and civilian observers far exceeded what might have been expected of such a nondescript unit.

Major credit must be given to the initiative and persistence of the commissioned personnel and to the excellent performance of all ranks, as well as to the sympathetic support of the Chief of Cavalry. The following officers, originally assigned to the Mechanized Force, were particularly effective in the development of mechanization during the period in which the Detachment for Mechanized Cavalry Regiment existed:

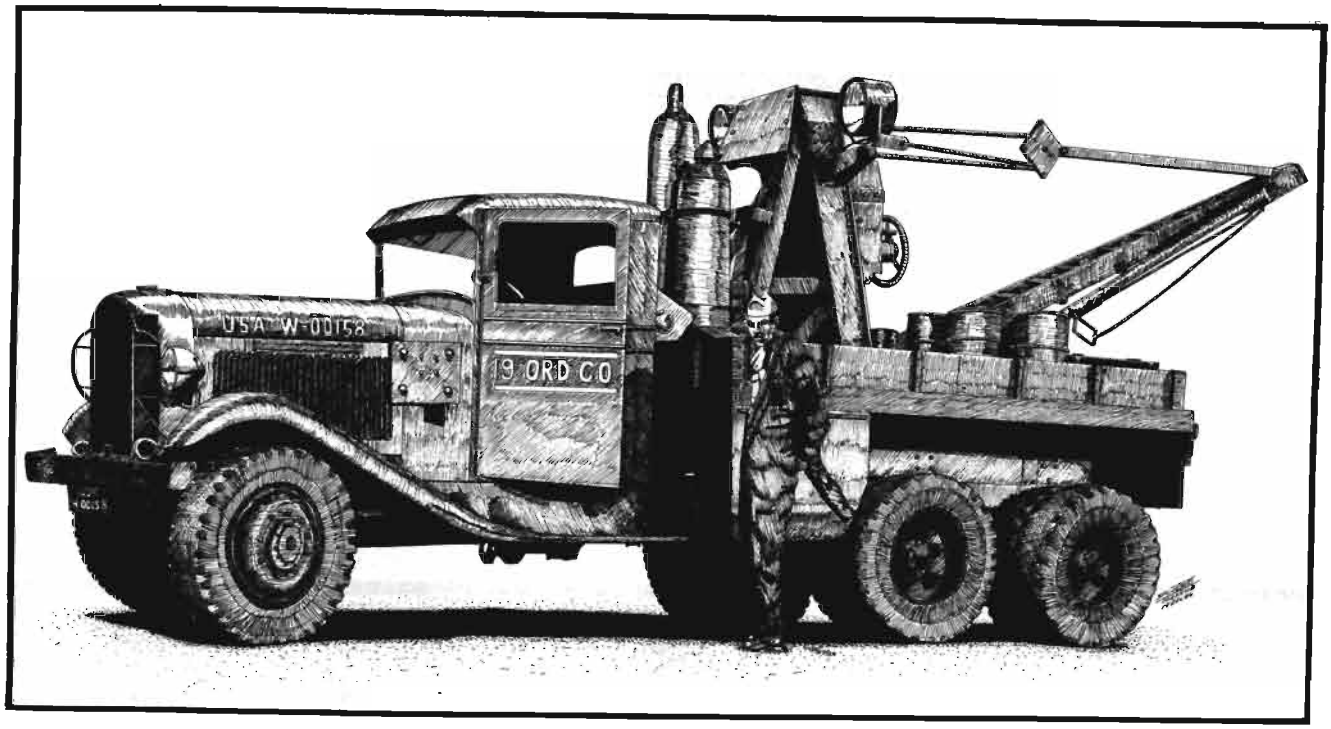
Daniel Van Voorhis, Colonel
Adna R. Chaffee, Lieutenant Colonel
Robert W. Grow, Major
Davis G. Barr, Captain
Paul S. Edwards, Captain
Charles H. Unger, Captain
Earl S. Gruver, First Lieutenant
Joseph P. Holly, First Lieutenant
Thomas H. Nixon, First Lieutenant
James H. Phillips, First Lieutenant
William P. Withers, First Lieuten ant

Detachment, 1st Cavalry (Mechanized)

The change of designation of the mechanized unit at Fort Knox on 1 July 1932 appears at first glance to be nothing more than a paper transfer and change of name. It did, however, constitute a commitment of major significance. The Chief of Cavalry and the Cavalry arm had taken the one step that was essential if cavalry was to become an effective combat force (i.e., the substitution of iron horses for flesh and blood horses in an *existing* cavalry regiment). That this substitution was not carried out to its full extent in the years that followed does not reflect adversely on the cavalry officers who served at Fort Knox.

Although we could not expect the complete mechanization of the 1st Cavalry for many months, we had a definite objective and were able to create a specific type nucleus for a balanced combat unit. The organization and key officer assignments as of 1 July 1932 were as follows:

SQUADRON HEADQUARTERS:
Daniel Van Voorhis, Colonel, Commanding
Robert W. Grow, Major, Executive Officer and S3
Carl Rohsenberger, Captain, S4
Aladin J. Hart, First Lieutenant, Personnel Adjutant



William P. Withers, First Lieutenant, Adjutant

HEADQUARTERS TROOP:
William P. Fletcher, Captain, Commanding
Clyde B. Bell, First Lieutenant, Communications Platoon
John C. Hamilton, First Lieutenant, Headquarters Platoon
James H. Phillips, First Lieutenant, Maintenance Platoon

COMBAT CAR TROOP:
Harrison H. D. Heiberg, First Lieutenant, Commanding

MACHINE GUN TROOP:
C. Stanton Babcock, First Lieutenant, Commanding

TROOP A, 2D ARMORED CAR SQDN (ATTACHED)
Charles H. Unger, Captain, Commanding

POST HEADQUARTERS (SPECIAL DUTY):
Adna R. Chaffee, Lieutenant Colonel
William G. Simmons, Major
Richard W. Carter, Captain
Hal M. Rose, Captain
Frederick W. Fenn, First Lieutenant

Several other officers joined the unit within the next few weeks to complete the staffing of the organization.

Little progress was made in 1932 towards the development of mechanized equipment, but ample evidence of inadequacies in the few vehicles available cropped up in the many demonstrations that we gave for various organizations. On only one day were all four Christies running. Temporary repairs were made, and much of value for future design was learned. Christie visited Knox in early September and aired his differences with the Ordnance Department. After driving one of the vehicles and firing both the 37-mm gun and the caliber .50 machine gun that we substituted for it, I complained bitterly that the Christie was not built as a fighting vehicle but only as a mobile "cradle for an engine." The La France people, with Ordnance backing, spent weeks installing and testing the La France engine, but it proved inadequate.

A variety of studies on my desk competed for time all summer. The most important was a Cavalry School study on the employment of mechanized cavalry, sent to us for review. Others included the supply plan, maintenance records, and changes in TO&Es.

Little by little, new motor equipment came in. On 12 August, we were able to send a column to Toledo, Ohio, for a demonstration. Under Captain Unger, it included seven new T-4s, two Christies, six motorcycles, one kitchen truck, three cargo vehicles, four passenger cars, two repair trucks, and a wrecker. In September, we sent a convoy to Holabird to bring back 45 remodeled trucks. These turned out to be a lifesaver for the Marfa, Texas march coming up in December.

Jottings from my diary during the summer of 1932:

> Worked all PM on Christie monthly report. Made a point of designing cars for fighting and not for carrying an engine.
>
> Sent No. 3 Christie to Vogt Machine Shop to have front idler beam straightened. Van Voorhis rather discouraged at Christie outlook. We hear that appropriation bill carried money for tanks, but none for combat cars. *[Ed. Note: In 1932 the Infantry Branch was the proponent for all tanks. The Cavalry Branch only had proponency for combat cars and other scout vehicles.]*
>
> New draft of pamphlet from Cavalry School with orders from the Chief to write the chapter on mechanized cavalry regiment.
>
> Thorpe (Ord. Dept.) has proposed redesign of Christie giving much bigger crew compartment and more guns. He is opposed to turret.
>
> Two new T4 armored cars arrived by rail from Rock Island. Several improvements based on our recommendations. Principal weakness is still the dead front axle.
>
> Had three Christies running this AM. Took them out for rehearsal. Two promptly broke down.
>
> No. 3 Christie broke a crankshaft and camrod and tore the crankcase open. A mean job. 19th Ord. is pulling the engine.

One demonstration after another, with rehearsals, constituted the training program for the summer. Each demonstration was developed to test a tactical principle. Since we

were attempting to "sell" mechanization, the program was invaluable in spurring our initiative and encouraging top performance by all ranks. Things did not always go well, however. In one demonstration a Franklin armored car broke a front axle in front of the crowd. I met Senator Barclay during that demonstration, but he did not seem too interested in what we were doing.

The following are some jottings from my diary during a trip to Washington:

> Had a long talk with Middleton (La France) on speed and dependability. I want them in reverse order...We have asked for too much speed.
>
> Subjects of talks in the chief's office: Cavalry School thought on mechanization; limitations; new equipment; personnel; basic principles of employment. Ordnance going to design a new car this year. Well pleased with Washington visit. Both Chief of Cavalry and Ordnance know our ideas better. We have lacked a sympathetic understanding. I believe I helped out some.

Upon my return to Fort Knox, I had a talk with General Lindsey, who felt that the Chief was failing "miserably" in mechanizing the force. Lindsey wanted the 4th Cavalry to come to Fort Knox in addition to the 1st Cavalry.

Demonstrations for civilian components ended in September and the troops began range practice, which included combat firing with vehicular weapons. Van Voorhis and I did some firing on the M1 armored car. Van Voorhis took a mean bump on the head while reloading the weapon. We discovered that the telescope sight was no good while the vehicle was moving. I also drove, fired, and commanded the Christie over an unknown course to complete the Christie combat firing. I noted that the fighting compartment was not designed for cavalry combat. Observation and control was the greatest problem. The radio was also a problem with so many nets. Range practice with weapons was combined with officer driving instruction and tactical, maintenance, and communications instruction.

Rumors Abound

The rumor mills ground on when the Chief of Cavalry told us that he was by no means sure that the 1st Cavalry would come to Fort Knox. The G3 thought that we might go to Marfa instead. At the end of October, Van Voorhis told me that the Chief reportedly said that we could expect little in the way of either personnel or equipment for three years. On the last day of November, however, the *Courier-Journal* carried the news that almost put an end to the rumors of the past year:

> Long delayed plans for transfer of the 1st Cavalry from Fort D. A. Russell, Texas, to Fort Knox, where it is to be transformed into the first mechanized cavalry regiment in the U.S. Army, will be completed in January. Definite assurances to this effect were given to Representative Thatcher of Louisville by War Department authorities...[The] movement will probably be made by train since most of the horses will be left in Texas. Texas members of Congress have protested...Speaker John N. Garner, Vice-President elect, is attributed with having been largely instrumental in temporarily delaying the abandonment of these Texas posts.

Van Voorhis confirmed this story by telling me that the Chief of Cavalry had asked him for a tentative itinerary to Marfa.

The rumors did not stop with the publication of the story above. Although many of the rumors that we heard were grossly distorted, I include them to show the things that come to the ears of junior officers. General Lindsey had lunch with General MacArthur and General Henry in Washington in early December, and the rumor went around that Henry suggested to MacArthur that mechanization be dropped for 10 years. MacArthur supposedly told Henry that if the 1st Cavalry could not come to Fort Knox, he had better find another regiment quickly. Since this rumor came to me on the same day that Chaffee wired from Washington that a large amount of gas had been set up for us at the end of the month, I doubt that Lindsey's version is the complete story. The story does explain to some extent, however, why we were always in doubt as to the Chief of Cavalry's real attitude. Rumors did not cease with the subsequent changes in the office of the Chief of Cavalry, either.

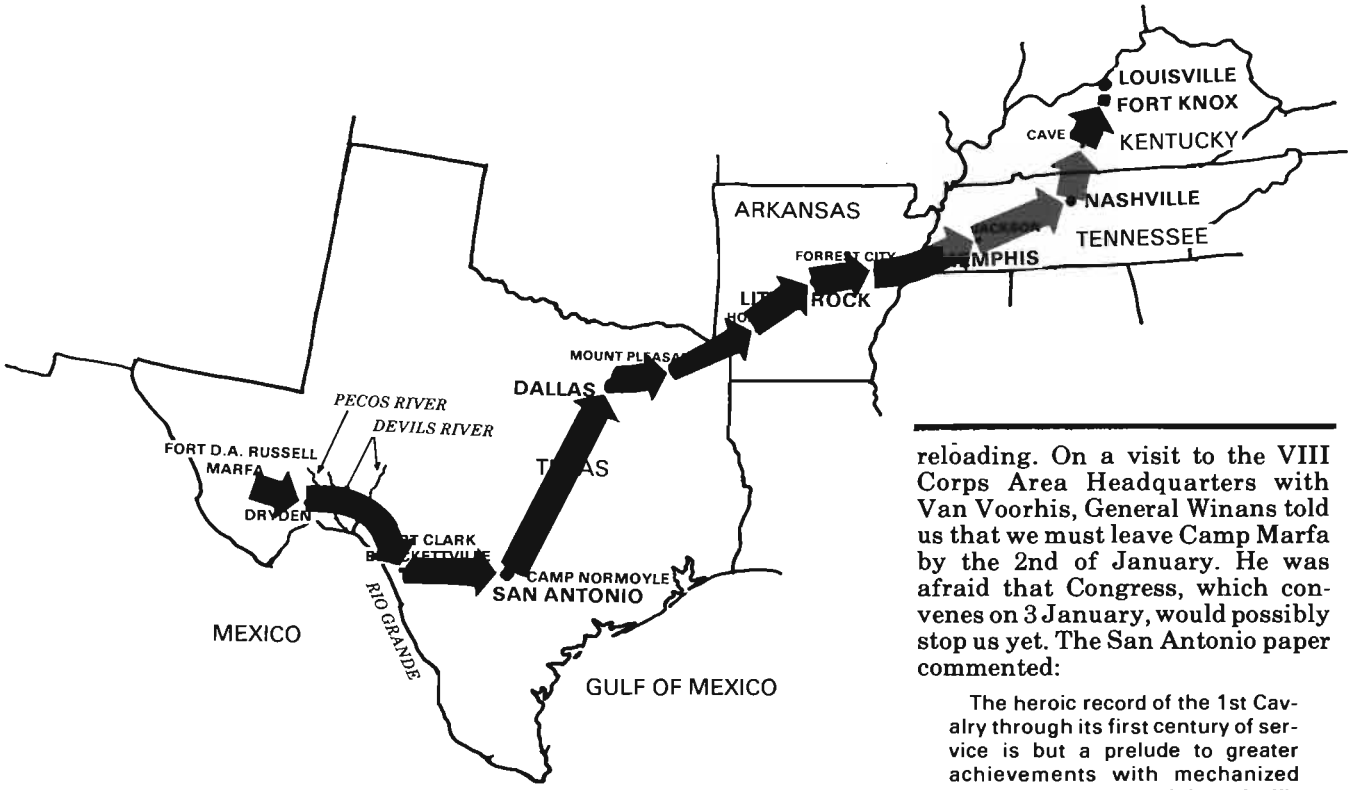
On 7 December we heard that we were to get the 1st Cavalry about 1 January 1933. We had prepared a plan to use the Marfa march as a training vehicle, employing all of our wheeled equipment and the bulk of our personnel. For reasons of economy, this plan was disapproved by the V Corps area. After considerable negotiation, we were cut down to the minimum essential to transport the troops from Marfa to Fort Knox. Final instructions directed us to depart Fort Knox on 17 December to reach Marfa on or before 30 December. At last, after a year as "Detachment for Mechanized Cavalry Regiment" and then "Detachment, 1st Cavalry (Mechanized)", the 1st Cavalry (Mechanized) would come into being.

"The Fort Knox-Marfa-Fort Knox march in mid-winter was remarkable — in fact, unprecedented for its time."

Map arrows (in red) trace historic route of the 1st Cavalry (Mech) from Texas to its new station at Fort Knox. Only one vehicle was lost on 3,240-mile trip, covered in 25 days. Troops camped in tents in sub-freezing temperatures.

The Marfa March

The Fort Knox-Marfa-Fort Knox march in mid-winter was remarkable — in fact, unprecedented for its time. The fact that only one vehicle was lost, that there were no other accidents and that the schedule was followed without change, reflects great credit on the men who drove the motley array of vehicles. The march was carried out during 25 marching days, with six layover days, and covered 3,240 miles. While the daily marches appear short by modern standards, it should be borne in mind that most of them were made in sub-freezing



weather and that the troops camped in pyramidal tents heated by Sibley stoves and slept on straw locally procured each day.

Notes from my diary highlight the conditions during the march:

> 17 Dec. Dispatched at 0800, with 11 officers and 104 men and 66 vehicles. Below freezing and the road south of E'town covered with fresh snow...Leading elements made camp at Gallatin at 1530... FWD 2-ton skidded over 30 ft. embankment at Westmoreland, hurting driver and put truck out of action.
>
> 18 Dec. Motors so cold it took an hour to get everything started. Dispatched at 0800...Still freezing. Men slept well.
>
> 19 Dec. Camped in fairgrounds at Memphis in wet snow...found a community house for the men to bathe. Laid over the next day and inspected all vehicles, finding many small items. The Memphis paper noted: "Back in the days when horses were king and kings weren't kings without horses, the 1st Cavalry used to dig in spurs and gallop into the midst of the bloodiest battles American history has known. But the World War changed the horse's status — not to mention the status of several kings. The death-dealing tanks, scouting motorcycles, and airplanes and armored cars relegated the mounted soldiers in the great conflict to a back position on the front of war. So Memphis was host last Tuesday to a shivering mechanized detachment of the famous 1st Cavalry, which is enroute to 'unhorse' the 1st Cavalry there [Marfa] and return it to the Kentucky post [Knox]...A self-contained unit capable of striking a hard, quick blow will be the result...
>
> 21 Dec. Dispatched from Memphis at 0735 somewhat delayed by poor starting. Drizzling rain and foggy. No police escort, so we dropped our own traffic men... Camp site at Lonoke proved to be excellent.
>
> 23 Dec. Experience was showing up. Dispatched from Prescott at 0700. The best start we have made...All closed in camp at Mt. Vernon by 1600. Pouring rain all evening, so men slept in trucks.
>
> 24 Dec. Clear and bright. We shed our mackinaws. Broke out the motorcycles for the first time...
>
> 25 Dec. A beautiful bright warm Christmas day. The two sections of our column rolled down Texas [Route] 3 through Waco to Georgetown.
>
> 26 Dec. Destination Normoyle QM Depot in San Antonio where all vehicles were parked in a shop and the men quartered in the gymnasium.

We laid over at San Antonio the next day, servicing, repairing, and reloading. On a visit to the VIII Corps Area Headquarters with Van Voorhis, General Winans told us that we must leave Camp Marfa by the 2nd of January. He was afraid that Congress, which convenes on 3 January, would possibly stop us yet. The San Antonio paper commented:

> The heroic record of the 1st Cavalry through its first century of service is but a prelude to greater achievements with mechanized equipment, in the opinion of officers who for the past year or two have been operating the new steel mounts of the regiment. Articles published throughout the country have decried the fact that the oldest cavalry regiment is being dismounted, the writers taking the position that the regiment is being done away with...This is far from the true facts...The regiment is being mechanized to increase its speed and efficiency and its history will continue with strong probability of even greater glory than in the past.

At least some of the press was giving us fair treatment.

We closed on Fort D. A. Russell in Marfa on 30 December. Our reception there was mixed. The troopers, in most cases, were interested and welcomed the change. The officers were doubtful, but since none of them were to come back with us, they showed more interest in their future assignments with horse units. We were deluged with questions, however, which indicated to me that Cavalry had reached a turning point.

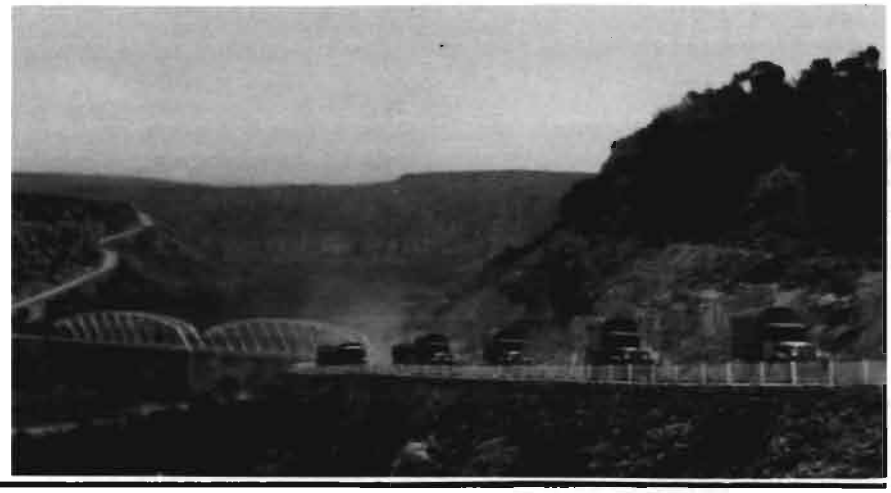
At 0815 hours on 2 January 1933, the convoy dispatched from Fort D. A. Russell. Our departure was not enthusiastically regarded in Marfa, as indicated by the following press item:

> Three hundred of the 'Dandy First' Cavalry Regiment left here today for their new post at Ft. Knox, Ky. As they departed, leaving behind 250 common-law wives and

Souvenirs of the Marfa March

A souvenir photo booklet commemorated the 1,600-mile road march. At left, the unit crosses the Pecos River in Texas. Below, many miles later, the long column crossed the Mississippi at Memphis.

(Photos from Patton Museum archives.)



some mixed Mexican-American babies, the citizenry professed to regard the virtual abandonment of the post with concern.

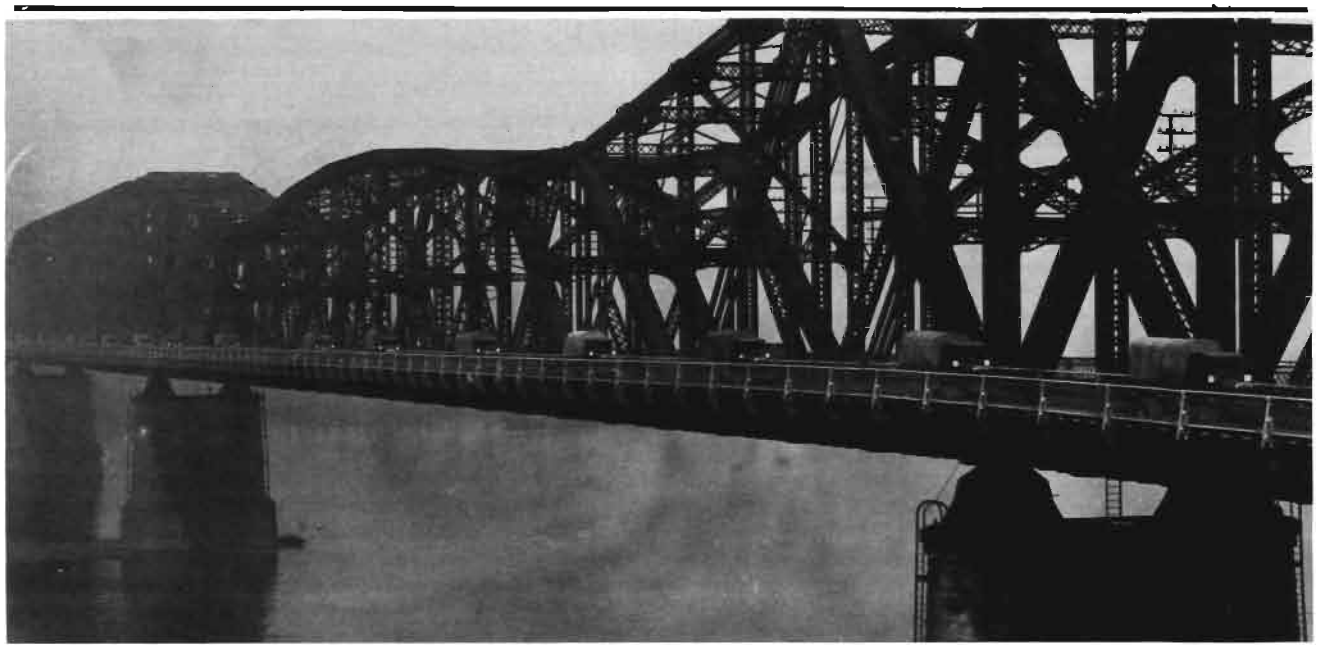
The return march was even more satisfactory than the trip down. The new men were delighted with the comforts of riding "fast and smooth" and the absence of any horse grooming duties. Many new hands took a turn at the wheel. At Little Rock, the local paper quoted me in part:

> "I want to correct a general misapprehension of what is to become of the 1st Cavalry. People see us passing through the country in motor trucks. They get the idea that this is the ultimate accomplishment. They hear and tell their friends that the reigment is to be motorized, which isn't so...You suddenly find yourself moving at considerably increased speed [and] you must think faster, act faster, speed up your facilities of observation, and get your advance information quicker. Your reporter suggested that it was kind of sad to see horses passing out of the military picture, but...cavalrymen [are] not looking at that side of it. They realize that mechanization must come and they are centering their interest on the new plan instead of on [the] history and tradition that the 1st [Cavalry] built up in a century of fighting on horseback. One thing they can be sure of. They are helping to perpetuate the great old regiment."

We left Little Rock on 12 January. On the 14th of January, we camped at Jackson, Tennessee, where quarters were provided in the armory. The basketball team from the regiment beat the Jackson National Guard team. Our reception was so cordial that the regiment renewed its visit a year later on a training exercise from Fort Knox.

An interesting press dispatch dated 13 January 1933 illustrates the difficulties encountered by the Chief of Cavalry, General Henry:

> Despite the long delay in the transfer of the 1st Cavalry from Ft. D. A. Russell to Ft. Knox, there is not anywhere near the proper equipment at the Kentucky post to mechanize the regiment, Maj. Gen. Guy V. Henry told the Military Affairs Committee during hearings on the War Department appropriation bill ...Reports that political considerations had been responsible for the War Department's delay in ordering the transfer of the 1st Cavalry... 'I have understood that your implements are out there [Fort Knox] rusting because of non-use while the soldiers were down in Texas' said [Chairman of the Military Affairs Committee Ross A.] Collins. 'A portion of our so-called implements are at Ft. Knox' replied Gen. Henry, 'but this regiment is by no means



Troops stopped for lunch at a roadside near Dixon, TN. A few days later, the column entered Fort Knox (photo at bottom of page).

> properly equipped with material. There is not anywhere near the proper equipment at Ft. Knox to mechanize a regiment.'

It is apparent that Representative Collins was misinformed as to the "rusting", but the fact remains that, over the years, he proved to be one of the most difficult to convince of our requirements. Years later, I appeared before his committee a number of times to justify even the most minor appropriation for equipment.

The march resumed on 14 January. We camped at Bellview, Tennessee, and the following day at Cave City, Kentucky. We could easily have reached Fort Knox on the 15th but preferred to make the short 60-mile march with a ceremonial return to our home station on the morning of the 16th. The press reported:

> As a welcoming rain commenced to fall, the long column of vehicles under the command of Col. Daniel Van Voorhis, which had trekked to Marfa, Tex. and back, wound its way into Fort Knox at 1030, Monday morning, Jan. 16. When the command passed in review before Brig. Gen. J. R. Lindsey, the speedometers clocked their thirty-two hundredth mile since the column left its home station on the 17th of Dec...

We were home.

This much is certain. The young 1st Cavalry (Mechanized) was ushered into active life with the longest march ever made by any Army unit in fewer than thirty days. Fort Knox had come into its own. The 1st Cavalry (Mechanized) slept under its own roof for the first time, on one post. The Blackhawks had switched horses, but not tradition. The oldest cavalry regiment in the army was still the oldest cavalry regiment — was still the glorious old First — with the same old toast that a century has mellowed: "First Today."

MAJOR GENERAL ROBERT W. GROW, whose career began as a horse cavalryman, became one of the pioneers in the mechanization of the U.S. Army. He was the first S3 of the Mechanized Force under Chaffee and Van Voorhis in the early 1930s and later commanded the 6th Armored Division in the European Theater during WWII. He retired as a major general in 1953 after serving as military attache in Moscow during the postwar years. General Grow died in November, 1985.

Captain Peter R. Mansoor and Kathy Cast Garth helped to prepare "The Ten Lean Years" manuscript for publication.

The S3/S4 Interface:

Operator and Logistician Must Work Together In Formulating Orders

by Captain C. S. Barnthouse

On the 29th of April, 1945, the 23d Cavalry Reconnaissance squadron crossed the Danube River near Neustadt, Germany, in pursuit of remnants of the Wehrmacht fleeing before the American onslaught into Bavaria during the closing days of WWII. The squadron commander had been made aware by his squadron maintenance officer and S4 that supply lines had reached their limit through the rapid advance since crossing the Rhine and that, because of this, resupply of fuel and repair parts would be problematic at best for the foreseeable future. The logistical situation, however, was not taken into consideration when the operation was planned, nor was there a well-thought-out plan for resupply. Indeed, supply of fuel was so short from the beginning, that the squadron's self-propelled cannons were left behind at the line of departure (LD). The squadron did receive a supply of fuel on the evening of 29 April, but by the next evening, two troops had been halted by shortage of fuel; on 1 May, the squadron found itself hopelessly bogged down outside the village of Dorfen, not by enemy resistance, but by fuel shortages and maintenance breakdowns. The operation had come to a halt because inadequate logistical support plans had led to inadequate support of the operation. The S3 and the S4 had not developed a unified plan, and this failure had stopped the unit when the disintegrating enemy army could not.[1]

This situation, of course, is not the only example of failure to integrate logistical and operational planning at either high or low levels. Our history books are full of them. Well-known are the logistical failures that led to the dissolution of the French and German armies in Russia. Less well-known is the failure in British logistical planning that ultimately led to their

defeat by the numerically and materially inferior Continental Army. In December of 1776, the Continental Army under General George Washington, having suffered a series of defeats, was being pursued through New Jersey. With the British Army to his front and the Delaware River to his rear, Washington ordered all boats along the river seized and thereby made his escape into Pennsylvania with what was left of his Army. The Delaware should have posed no obstacle to the British since their army normally carried collapsible boats in its supply trains when campaigning. Upon arrival at the river bank, however, the British discovered that the quartermaster had not brought any boats along on this campaign. With all available boats held by Washington's forces, the British found themselves unable to pursue an enemy that for all intents was already defeated and merely waiting for the death blow. American control of these key transportation assets (boats), coupled with a historical European distaste for winter campaigning, led the British to break off their pursuit and go into winter quarters in New Jersey. This failure in coordination between the British tacticians and their quartermaster gave General Washington the breathing space he needed to reorganize and rejuvenate his little band sufficiently to re-cross the Delaware and deal the British a startling defeat at Trenton barely two weeks later.[2]

So, from its beginning, the lesson of the American Army has been that logistics and operations go hand in glove, and that operations planned without logistical considerations are almost certainly doomed to failure. In the same way, logistical operations planned without considering the operation they are to support may do little to further their cause.

Nowhere is this more apparent than in the operational planning of most heavy battalions (armored and mechanized). Planning time, always at a premium, has led to the S4 writing his Paragraph 4 at the same time as the S3 is preparing Paragraph 3. Often, these two critical staff officers fail to coordinate their planning and, as a result, produce plans that, if they are not at cross purposes, are at least not well-disposed to support each other. In the end, the company commander receives two sets of overlays, one operational and one logistical, and an operations order containing uncoordinated Paragraphs 3 and 4. The commander, pressed for time, hands the logistical plans and

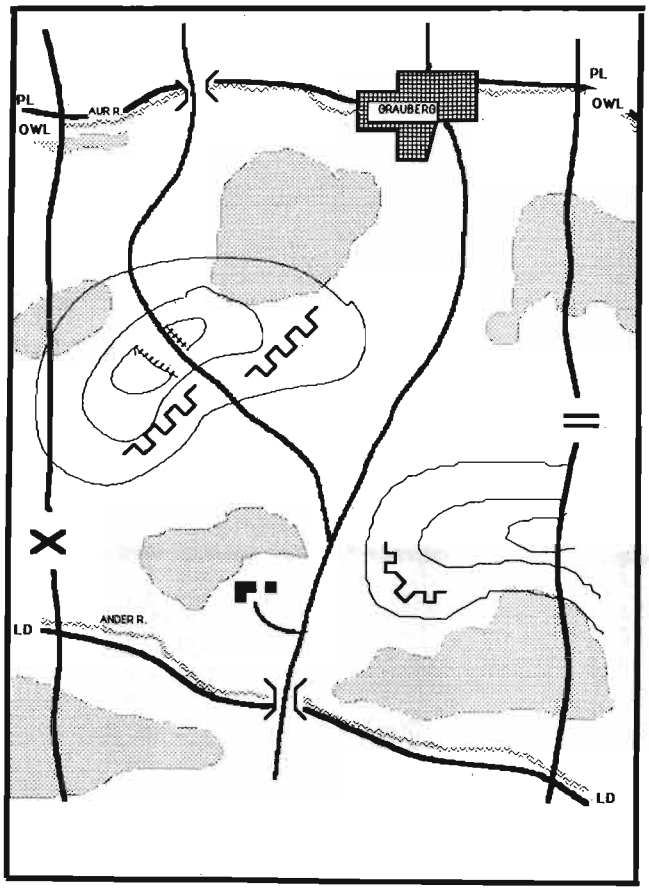


Figure 1 — Map of operation

LOGISTICS ESTIMATES IAW RB 101-999

CLASS V	ESTIMATED RESISTANCE	DAILY DEFEND	EXPENDITURE TOTAL:	ATTACK	TOTAL:
105MM TANK					
RDS/TK/D	HEAVY	62		52	
	MODERATE	35		29	
X 28 TKS	LIGHT	12		10	280
TOW					
RDS/TOW/D	HEAVY	9		7	
X	MODERATE	6		4	
14 TOWS	LIGHT	4		2	28
DRAGON					
RDS/TRKR/D	HEAVY	3		2	
X	MODERATE	2		1	
21 TRKRS	LIGHT	1		1	21
LAW					
RDS/INF PLT	HEAVY	13		11	
PER DAY	MODERATE	7		6	
X 6 PLT	LIGHT	3		2	12
.50 CAL M2					
RDS/INF PLT	HEAVY	840		700	
PER DAY	MODERATE	472		396	
X 6 PLT	LIGHT	156		132	792
40MM					
RDS/INF PLT	HEAVY	156		132	
PER DAY	MODERATE	84		72	
X 6 PLT	LIGHT	30		24	144

CLASS III:		FUEL	UTILIZATION		
TYPE UNITS:	QTY UNITS	GAL/KM DF2	GAL/KM TOT	GL/KM/MOG	GAL/KM TOT
MECH CO.S	2	5	10	0.11	0.22
TANK CO.S	2	13.5	27	0.4	0.8
EGR PLTS.	1	2	2		
ADA PLTS.	1	2	2		
HHC	1	9	9	3	3
E CO	1	5	+ 5	0.11	+ 0.11
		TOT GAL/KM	55	TOT GAL/KM	4.13
TOTAL KM	ON ROAD	THIS OPN:	8	KM ON ROAD	8
KM X-CTRY		X 2.5	+ 55	KM XC X 2.5	+ 55
FUEL CONSUMPTION EST.			63		63
FUEL EST. X	GAL/KM	DF2	3465	MOGAS	260

Figure 2 — Pre-tabulated logistical requirements

overlays to his executive officer or first sergeant and goes about his battle planning without taking logistics into consideration at all, trusting in a combination of Divine Providence and a creative first sergeant to sustain his effort. This leads, all too often, to disaster.

What we need to alleviate this situation, and to reduce the time to prepare and present operations orders, is for the S3 and the S4 to work together on all orders. In so doing, they should both work off of the same graphics and produce an operations order in the form of an execution matrix that addresses both operations and logistics. In order to illustrate this point, I provide the following example of such a process used by a task force staff in planning an operation.

In this example, a balanced task force of two mechanized and two tank teams has received an order (Figure 1) from its brigade commander to cross the LD on the Ander River, attack northwards, clear all resistance in sector, and seize bridgeheads over the Aur River. Although prepared enemy positions are in the sector, enemy resistance is expected to be light. The brigade commander explains that he wants at least one crossing captured quickly and the route to it cleared of resistance so that he can exploit any penetration of the Aur with an armor-heavy task force currently in reserve.

The S4 is immediately called forward to the TOC to assist in planning. Upon arrival there, he analyzes the order. He estimates logistical requirements by using pre-tabulated data for the task force (Figure 2) and determines which of the proposed courses of action (prepared while he was enroute to the TOC from the combat trains) he can support and which he cannot.

Taking the S4's advice into consideration, the task force commander determines that he wants to make his main effort against the bridge over the Aur River in the western part of his sector, since he does not wish to get bogged down in a lengthy fight for the village of Grauberg. The western bridge may be captured more rapidly and achieve the brigade commander's intent, even if Grauberg is not captured.

The S3 and the battalion commander study the brigade graphics and the map and place their own graphics over the brigade's (Figure 3). The task force commander then settles on a course of action where a mechanized-heavy team (Tm. Alpha) crosses the intact bridge over the Ander at Checkpoint 11 and attacks Objective Able. Once Able is secure, a tank-heavy team leading (Team Tank) with a mechanized-heavy team (Team Delta) following will attack along Axis Blue. At PL Hawk, the teams will pull abreast, with Tm. Tank attacking to seize OBJ Baker South, and TM. Delta attacking to seize OBJ Baker North. Check Point 22 is a contact point. Upon OBJ Baker being secured, the remaining armor-heavy team (Team Armor) will pass through the objective on Axis Blue to continue the attack against the bridge over the Aur River at OBJ

"...The lesson of the American Army has been that logistics and operations go hand in glove..."

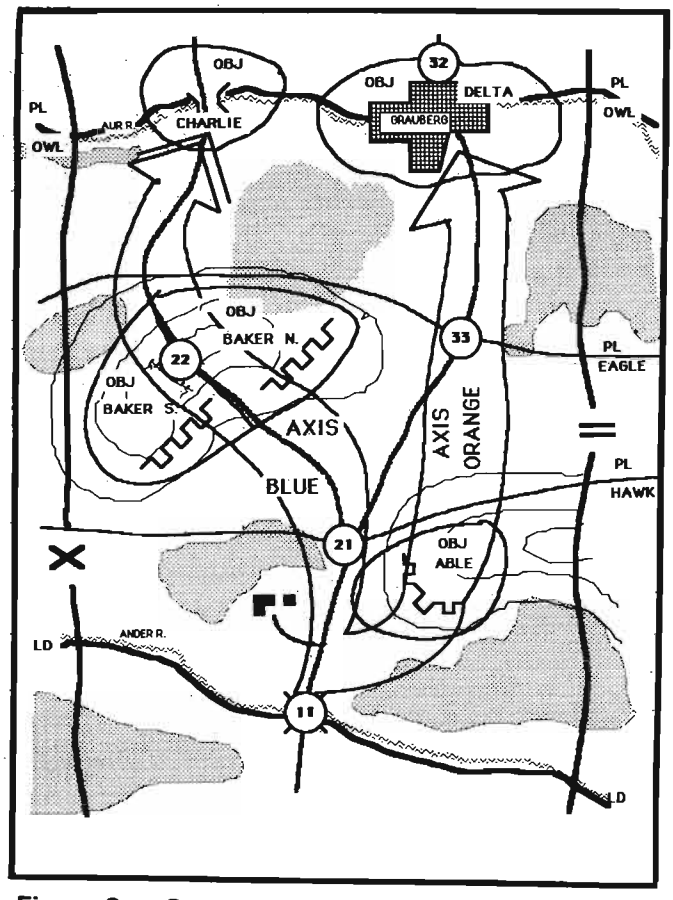


Figure 3 — Commander and S3 add graphics

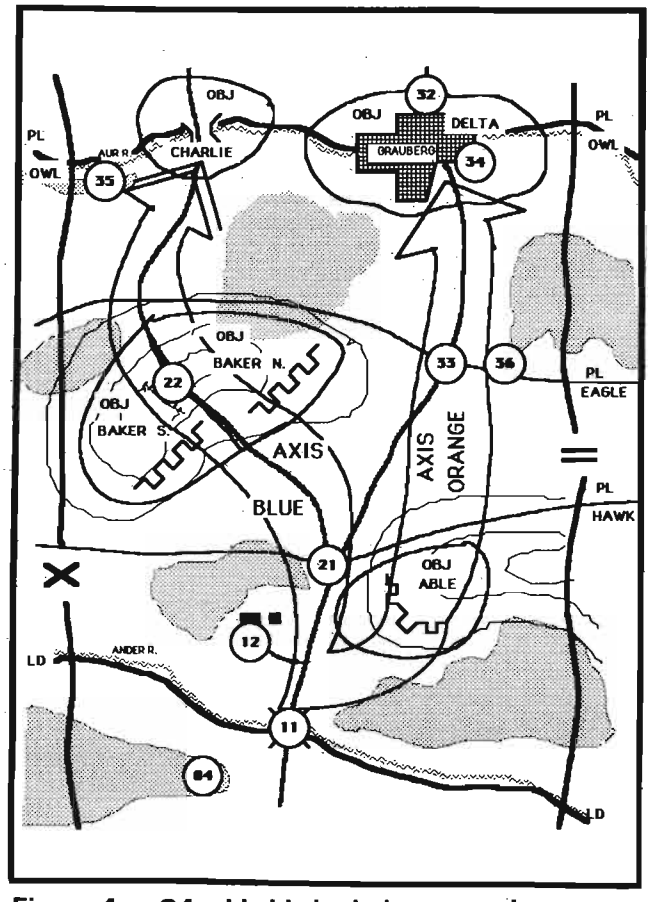


Figure 4 — S4 adds his logistics controls

Charlie. When Team Armor reaches Phase Line Eagle, Team Tank will move off OBJ Baker South, following Team Armor on Axis blue and supporting in the attack on OBJ Charlie. Simultaneously, Team Alpha will move out along Axis Orange in a support attack on OBJ Delta. Team Delta is to remain on OBJ Baker North, orient fires on Objective Charlie, and be prepared to support the attack on OBJ Charlie by fire or maneuver, to assist in the seizure of OBJ Delta, or to clear any resistance out of the forest between OBJ Baker and the Aur River.

Once the S3 has placed his graphics on the map, the S4 — having been involved in the planning from the beginning and having determined that the proposed operation can be supported — asks that several additional checkpoints be added to the graphics as logistics control measures. Once these are added (Figure 4), the S4 presents his support plan. When Team Alpha crosses the LD, all logistical support assets will be in the current combat trains position (not shown). Once OBJ Able is secure, he will push maintenance and medical assets forward, behind attacking teams Tank and Delta and establish a forward maintenance collection point and aid station at the farm complex at CP 12. He also designates the farm complex as a logistics release point (LRP) in case any of the units need an emergency resupply.

Once OBJ Baker is secure, the combat trains will follow Team Armor across the Ander River and occupy CP 12, absorbing the assets that have collected there during the early phases of the battle. CP 21 will then become the LRP since it services Objectives Able and Baker equally well and is shielded from the direct observation of enemy positions along the Aur River.

As PL Eagle is crossed, the task force will begin an attack along two axes, so the S4 will split his support assets, pushing some maintenance and medical assets forward to CP 22 to support the main attack on OBJ Charlie and retain some assets in the combat trains at CP 12 to support the attack of Team Alpha along Axis Orange.

As OBJ Charlie is seized and Team Alpha crosses PL Eagle, the combat trains will displace to CP 22, follow the main effort, and again absorb any assets which have collected there during the battle. At the same time, maintenance and medical assets will move to CP 21 to continue the support of Tm Alpha's attack on Axis Orange. Two LRPs are again designated, each supporting a different axis of advance.

As Team Alpha reaches OBJ Delta, assets supporting its advance will be pushed forward to the woods at CP 36. Once the task force has secured its sector up to its limit of advance at PL Owl, the maintenance and medical assets will move to the edge of the village of Grauberg in order to make use of any facilities which may be available there. LRPs are at CPs 34 and 35 to support both objectives with Class I, III, and V resupply at the close of the operation. Main supply routes (MSRs) and alternate supply routes (ASRs) throughout the operation are designated by axis names, thus avoiding additional graphics.

Once the task force commander has given his approval for this plan, the S3 and the S4 enter all information, both operational and logistical, onto a single execution

PHASE / UNIT	LD	OBJ ABLE	OBJ BAKER	PL EAGLE	OBJ CHARLIE	OBJ DELTA	PL OWL
TM A	CROSS 0700 ATTACK ON AXIS O. TO SEIZE ABLE	SECURE OBJ ABLE, ORIENT TO NORTH, SUPPORT TK.	ORIENT TO NORTH	ATTACK ON AXIS ORANGE TO SEIZE OBJ DELTA	CROSS PL EAGLE ATTACK DELTA	ORIENT ON CP32 SEIZE BRIDGES INTACT	OCCUPY CP32 ORIENT TO N. PREPARE TO PASS UNITS
TM TANK	SUPPORT TM A. BY FIRE FROM CP 04	LEAD ON AXIS BLUE, ATTACK TO SEIZE BKR N.	ORIENT TO N., SUPPORT TM AR BY FIRE	ORIENT TO N., PREP. TO FOLLOW AR. ON AXIS BLUE	ATTACK ON AXIS BLUE ASSIST TM AR TO SEIZE CHRLIE	OCCUPY CHARLIE WEST ORIENT ON N.W.	OCCUPY CHRLIE WEST, PREP TO PASS UNITS FORWARD
TM D	OCCUPY AA	FOLLOW ON AXIS BLUE, SEIZE BAKER SOUTH	ORIENT TO NNW, SUPPORT TM AR. BY FIRE	ORIENT TO NNW SUPPORT ATTK OBJ C. BY FIRE	ORIENT TO N. PREPARE TO SUPPORT ATK ON C OR D	RESERVE ON BAKER NORTH, PREPARE TO SUPPORT TM A.	RESERVE ON BAKER NORTH, PREPARE TO REINFRC TM A
TM ARMOR	OCCUPY AA	IN RESERVE, CP 04	PASS THRU TM D&TK, LEAD ON AXIS BLUE, SZ CHRLI	LEAD ON AXIS BLUE, ATTACK TO SEIZE CHRLIE.	ATTACK TO SEIZE CHARLIE ORIENT TO NORTHEAST	OCCUPY OBJ. CHARLIE WEST ORIENT TO NORTHEAST	OCCUPY OBJ. CHARLIE WEST ORIENT TO NORTHEAST
CBT TRNS	SUPPORT IN POSITION	SUPPORT IN POSITION	CP 12	CP 12	CP 22	CP 22	CP22
UMCP	COLOCATED WITH CT	CP 12	CP 12	CP22, CP12	CP22,CP21	CP22, CP36	CP22, 34
BAS	COLOCATED WITH CT	CP 12	CP12	CP22, CP12	CP22,CP21	CP22, CP34	CP22
LRP	CP 01	CP 12	CP21	CP21	CP22, CP21	CP35, CP33	OBJ CHRLIE: CP 33 OBJ DELTA: CP 34 CL. I, III, V
MSR	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE	BLUE
ASR	NONE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE	ORANGE

Figure 5 — S3 and S4's information combined

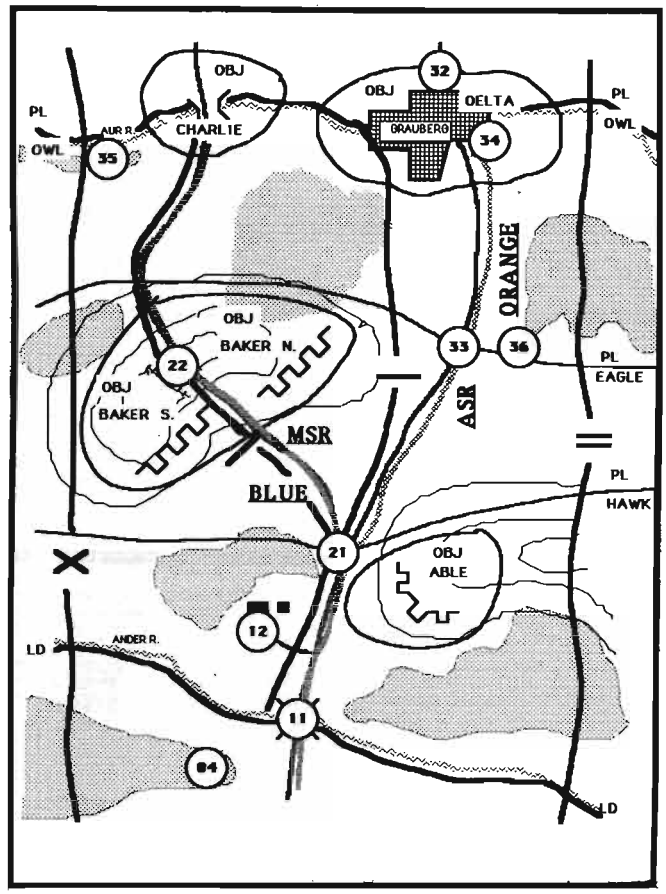


Figure 6 — S4's MSR and ASR added to overlay

matrix (Figure 5) in order to simplify preparation of the written order. Although both Paragraphs 3 and 4 of the operations order will be read as written above during the presentation, the subordinate unit commanders will receive only copies of the operations/logistics overlay and the execution matrix. In this way, planning time is maximized while reproduction time is minimized and written materials are simplified.

"...It saves time and reduces possible confusion by placing all graphics on the same overlay..."

Summary

Using this method of planning and presenting operations orders, fully integrating Paragraphs 3 and 4 into a single, all encompassing plan is possible. Additionally, it saves time and reduces possible confusion by placing all graphics on the same overlay and eliminates the need for preparation of the often-lost and usually-ignored logistics overlay. Of course, axes of advance may not always be selected as control measures. In this case, a single overlay may still be produced if the S4 draws his MSR and ASR on the operational overlay (Figure 6). Adoption of this technique carries with it the additional benefit of establishing within the task force a well-ingrained SOP as to where task force logistical assets may be found at any given phase of a battle. In this way, should the S4 for some reason be unable to participate in the planning of an operation, or should the logistics plan not be disseminated, company/team CSS personnel will be able to determine, from the operational graphics, roughly where task force service support assets will be located, and be able to pinpoint them through directions received over the Ad/Log net.

The execution matrix shown in Figure 5 can be easily prepared ahead of time by drawing blank matrices on stencils and, once a plan is made, by typing or writing in the information and then running off copies on a hand-cranked mimeograph machine. If all of the information necessary for the operation cannot fit onto one matrix (as will almost always be the case) several matrices can be used. Indeed, it may be preferable to place all service support information on a separate matrix at all times, so that the commanders can pass that matrix to their XOs or first sergeants and let them do the company/team logistics plan while the commander plans the maneuver.

Should the situation arise where stencils and mimeograph sheets are not available, the execution matrix can be reproduced, at a greater expenditure of time and effort, through the use of industrious

soldiers, carbon paper, and observed firing charts (grid sheets) used by 4.2" mortar and field artillery FDCs. In any case, such a matrix allows the commanders to follow the flow of the battle in sequence with the flow of logistical support for that battle and his relationship to both throughout the planned operation.

Conclusions

The key to success on the modern battlefield is dependent not only upon careful operational planning, but on detailed logistical planning and the integration of the two into a single, understandable plan. Also critical to success is the timely dissemination of that plan to subordinate commanders. In the past, the Army has gone by the 1/3-2/3 rule of planning time. That is, from receipt of an order, the higher headquarters must use only 1/3 of the time remaining prior to the beginning of the operation in planning the operation, allowing the subordinate headquarters 2/3s of the time for preparation. Although this is a goal that is not often reached, it is even now under attack as allowing insufficient time for subordinate elements to prepare for an operation. In the 4th Infantry Division, for example, the standard is now a 1/5-4/5 rule. This can only be achieved if brigade and battalion staffs alter the way they do business.

Such time frames can never be achieved if the attempt is made to produce operations orders with lengthy narratives and with several overlays. They can only be achieved if the staff presents its operations order orally and hands subordinate commanders a written order consisting of a single overlay and a hard copy only of the task organization, situation, mission statement, and execution matrix. Indeed, we may find that such actions make operations more understandable to commanders and therefore reduce their planning times. More importantly, however, it may teach the operator and the logistician that their plans are interdependent and that victory can be achieved only if both plans are synchronized and understood by all.

Footnotes

[1]Schaudt, Howard P., "The Operations of the 23d Cavalry Reconnaissance Squadron in the Vicinity of Munich, Germany, 29 April - 4 May 1945." A personal experience monograph written at the United States Army Infantry School, 1948.

[2]Daniel, Hawthorne, *For Want of a Nail.* New York: Whittlesey House, 1948.

CAPTAIN CHRISTOPHER S. BARNTHOUSE enlisted in the Army in 1972 and served with the 7th Special Forces Group. He subsequently served with the Louisiana National Guard and graduated from Nicholls State University. Since then, he has served as mortar, rifle, and support platoon leader and as company XO in the 8th Infantry Division and in various staff assignments at Ft. Carson, to include BMO and Battalion S4. He is currently Assistant S3 of 1st Brigade, 4th ID.

Artillery Under Fire

In his article, "Fixing Something That Ain't Broke," (*ARMOR*, Nov-Dec 1986), my friend and otherwise reputable armor officer, Jim Hollis argues that the field artillery organization and doctrine need not be changed to accommodate new doctrine and changing battlefield dynamics. Lest a whole generation of impressionable, young soldiers accept his arguments as fact, I offer a dissenting opinion — not an analysis but perhaps a balancing polemic.

I suspect his article is in reaction to some analytical work done at the National Defense University which recommended smaller, more agile, heavy divisions and, as a consequence, proposed some semi-radical changes in artillery structure. It would be a grave error to squelch significant gains in total capability because of emotional ties to tradition.

First, here is my perspective. Most of my career has been spent in the field, seven years of it in command of armor and cavalry units from company to brigade level. I have commanded artillery in a regimental squadron, and a heavy brigade with a DS battalion in habitual relationship. In addition, most of my staff time has been at the tactical level. Thus, my comments will be focused on the practical vice the theoretical. Let me be upfront and clear: I am *not* arguing that "organic artillery is the solution to the problems that currently surround the direct support business, nor is it necessarily the wave of the future as we adjust our organizations to better fit our doctrine. It might be...but only after considerable thought, analysis, and testing. I *am* arguing that the issue is by no means settled and that thought, dialogue, and perhaps change are necessary.

I take issue with Lieutenant Colonel Hollis in three general areas:

- That Artillery "Ain't Broke."
- That changing artillery doctrine, organization, or procedures "would, in fact, violate the cardinal tenets of AirLand Battle doctrine."
- "The Analysis."

"It Ain't Broke"?

A basic problem we have is that when we discuss artillery doctrine, we are talking about a theory of centralized artillery control that has not been tested in recent combat but which seemed to work fairly well in the small, slower, simpler divisions of WW II and Korea. Since we have no real battle experience in modern mechanized warfare, we should look to our best simulations (exercises) and at recent, actual combat to validate our theories. There is nothing in division-level CPXs, REFORGERs, the NTC or Mid-eastern combat experiences that leads me to believe that our current organization is optimal. In fact, the evidence seems to point the other way. My experience tells me that the argument that the division artillery commander can sit at some confluence of perfect information flow and quickly shift and mass fires of DS battalions as the maneuver battle ebbs and flows is a fantasy.

Of course, artillery is not "broken," but we do have big problems in the DS business. At the National Training Center, approximately one-third of all direct support artillery fire missions are "good" missions (meaning that artillery falls within 500 meters of the OPFOR unit). Two-thirds of the missions fired are wasted. The NTC is not the perfect model for all combat; however, data I have seen (drawn from 15 rotations and over 3,000 fire missions) are overwhelming, and nowhere else do we come as close to the actual battlefield dynamic.

Besides this lack of targeting accuracy on an unfamiliar and fluid battlefield, I have observed a lack of capacity to coordinate movements between the maneuver and the fire support elements of the combined arms team. We don't practice this aspect of the battle enough. During training, artillerymen don't like to be captive to the unpredictable ebb and flow of the maneuver units; it is tedious, time-wasting, and interferes with the technical aspects of their ARTEP. Likewise, maneuver soldiers often prefer to have the FSO "CPX" the movement of the batteries and TOCs of the artillery because it simplifies the exercise. Compounding the problem, there is insufficient space at most training areas to put a strain on the system even if the desire is there.

How often has anyone seen a full-up, division-level exercise where all the batteries of the division artillery, plus corps supporting units, were required to be positioned on the ground in response to a fast-moving, free-play exercise — all the while answering calls for fire against a non-cooperative enemy from 30 or so companies in contact? And, on those occasions where this might have occurred, how thorough was the evaluation afterwards? My experience has been that we avoid these situations, but when we do attempt to put it all together, the FSO and the S3 have virtually no experience in controlling locations or routes. The communications networks become bottlenecks, and nobody really notices whether the batteries are actually capable of responding to very many of the calls for fire as everyone is scrambling to keep up with the battle. How good are we, really? Nobody really knows!

Any Change Violates Doctrine?

The current J-Series Division, designed when our focus was on Active Defense, is a large organization with long staff action and orders cycles but massive firepower. It is very well-suited for the attrition component of combat but tends to be lethargic in the maneuver ring, often because so many of the coordination requirements are centralized at the division staff. The Army of Excellence (AOE) organizational changes reduced some of the manpower and provided a little more flexibility to the corps commander in his "new" role as a warfighter, but did nothing significant to improve the agility of the division. There will be some people who will describe their division on a REFORGER as nimble — but realis-

tically, compared to what? Other current divisions? And how agile would they have been if they really had to coordinate all the aspects of the battle?

The NTC has shown us the improvement potential at the task force level. What improvement vistas are not even imagined, much less seen, at division level where synchronization requires a staff of hundreds? Today's division is WW II's corps, tripled in complexity and speed. You need not be a glassy-eyed zealot to question whether Korean War organization and procedures will suffice in 1995. Even the change from the "target servicing" mode of the Seventies to the maneuver-oriented concepts of the Eighties might have caused rational people to question whether artillery out of the same mold is equally appropriate for both. On the business end of the artillery structure, we have new munitions, new modalities for fire control, and new techniques of movement and disposition. But free and open explorations of new fire support methods are too often discouraged.

The tenets of AirLand Battle include agility, initiative, synchronization, and depth. An organizational change to small, self-contained combat units which would simplify procedures, provide for integrated training, reduce the level required for synchronization, slim down the division headquarters, and give the corps commander more (but smaller) units and the capacity to task-organize his divisions would seem, at first blush, to fit these tenets. These changes may have some downsides but cannot be so easily dismissed as a violation of the cardinal tenets of AirLand Battle.

The Analysis?

I have two problems with Jim Hollis' analysis. First, it's really an argument, not an analysis; and second, it's based on assertions which are disputable.

An analysis is an examination of the whole, piece-by-piece. What we have in this article is a one-sided argument. Where is the other side of the picture? The work at the National Defense University over the last two years was done by some very talented and experienced officers who made recommendations to fix some very real problems. A true analysis would have included an examination of the reasons behind these recommendations, argued the validity of the assumptions and the judgments, and compiled an advantage/disadvantage array.

As to the assertions with which I disagree, the first is that a field artillery battalion, given the mission in direct support of a maneuver brigade, is as responsive to the supported unit as a field artillery unit that is organic. I've had it both ways, and in my experience, that is just not so. No matter how good a DS unit is and no matter how hard they try, they simply cannot provide the same intensity of purpose to the supported unit that an organic unit does. The goals of any unit tend to coincide with the goals of its parent. There are inevitably differences between what is best for DIVARTY and what is best for a particular brigade, in peactime or war. It's not a matter of the artillery commanders needing to try harder. The brigade I commanded received superb support from both DIVARTY and DS battalion commanders; it's deeply ingrained in every artilleryman's professional ethos. No matter how hard the human element tries, however, the structure and the dynamics of organizations inhibit total allegiance. The character of support provided by direct support artillery is not "complete and unequivocal" by the very nature and definition of direct support. We can argue about which approach (DS or attached/organic) provides the optimum overall support, but we should not kid ourselves that one of the two has no disadvantages.

The habitual relationship between brigades and DS battalions is fairly well-standardized, Army-wide; however, not many divisions require FSOs and FIST teams to "live, work, and train" in the supported unit. Rather, these teams are more often used as holding patterns for other jobs. The primary focus of the artillery units is on technical competence, not on the coordination interface between fire support and maneuver. FSOs are normally inexperienced, junior, and changed too frequently to provide either the procedural knowledge or the bonding needed between field artillery and maneuver units. It only takes a few observations at the NTC, or elsewhere, to recognize that the capability of the FSO is the key to fire support success. Artillerymen recognize this, but are caught in a dilemma because the peacetime demands are on the battery command positions, technical expertise in FA functions, and the ARTEP. I've had numerous senior artillerymen tell me that this would all change in combat. Waiting until wartime to fix a recognized problem is a bad answer, but it's the best answer we get. Would organic artillery totally solve this problem? No, but there would most certainly be a shift in emphasis.

Hollis believes that a maneuver brigade is neither equipped, trained, nor inclined to assume the tasks of supporting an artillery battalion. Under the Forward Support Battalion (FSB) concept, this is simply not so. The DS artillery battalion associated with a maneuver brigade is supported by the FSB habitually (always) supporting that brigade (another piece of organizational folly, but that's another story). The typical brigade commander pays as much attention to his artillery service support posture as he does to any of his other battalions in the field. The artillery battalion is really easier to support than a maneuver task force, with the possible exception of Class V supply. Support is a red herring issue; the brigade and its FSB do it all the time in the field.

Training is a double-edged sword. When training is under the purview of the artillery, we get technical competence but loss of synchronization, as we have seen. Under the auspices of the brigade commander we would, presumably, gain in the maneuver and synchronization aspects, but lose in the technical skill category. I would suggest that ensuring satisfactory levels of technical capability is not insurmountable at the maneuver echelon; it might require different techniques — for example, giving some of the technical training responsibility, especially the technical testing, to the new FA brigade commanders. Of course, armor and infantry officers are, at this time, ill-equipped to command artillery units (except, "magically," at division level), but this is primarily because, with indirect fire as the other components of the team, we have rarely trained to or tested for combined arms expertise. Moreover, with the one-

third success rate at the NTC, the division artillery training argument looks bleak at best.

The "span of control" issue is another red herring; the brigade commander is charged with orchestrating the sinews of combat power in his portion of the battle...all of them. His job becomes simpler if his units are organic. The battlefield is far more complex and faster moving today than it was even 10 years ago. Training and teamwork lead to synchronization, which usually dictates success or failure. An organic relationship provides a simpler environment on the battlefield and a more efficient and responsive environment in training.

Lieutenant Colonel Hollis says, "The last thing a maneuver leader wants to experience in the heat of battle is a debate over to whom the various artillery tubes and launchers "belong." I couldn't agree more, and would suggest that, if this were the only facet of the problem, the simplest approach to avoiding it would be the assignment of DS artillery to the maneuver unit it supports.

For flexibility, it would not be impossible, or even difficult, to establish communications that would permit organic units to answer calls for fire from other units, just as the current DS relationship provides. In the final analysis, everything belongs to the division commander anyway, organic or not. Detaching and reattaching "organic" elements is a basic aspect of a higher commander's flexibility. Company-teams and task forces rarely stay with their organic parent in realistic exercises. The same cross-attachment flexibility can be applied to artillery support. What is not mentioned in Hollis' article is that under a concept of organization which allows the corps commander to task-organize his divisions — by assigning self-contained maneuver brigades or regimental combat teams to the small, tactical division headquarters — the division would be assigned one or two field artillery brigades. These FA brigades, along with the division FSE, would provide much of the same planning, coordination, and tactical execution capability that is currently envisioned for the division artillery.

Finally, a word about "instability." We are in an era of technological explosion. Changes have become a way of life. We may not like it; it's uncomfortable, especially for us old guys, but the race is to the swift. Unless we press forward, we will lose. "The current field artillery doctrine has stood the test of time," meaning that it worked well for us in WW II and elsewhere when we could overwhelm our enemies with resources. It is not entirely clear that organizations and procedures developed, by and large, during the Great Depression, WW II, and Korea are optimal for the highly mobile, outnumbered battlefield of the Nineties and beyond. We need to be rational and cautious, but we should not be blinded by emotion, as we were 50 years ago when some cavalrymen and others inhibited the development of the Armored Force. Remember, Van Voorhis and Chaffee were perceived as fiery-eyed reformers in the decade of the Thirties as they put together the 7th Cavalry Brigade (Mechanized), our first armored, combined arms team. They did this in spite of the conventional wisdom of the day, which was perhaps best expressed by Sir Douglas Haig in 1925:

> Some enthusiasts today talk about the probability of the horse becoming extinct and prophesy that the aeroplane, the tank, and the motor-car will supersede the horse in future wars... I am sure that, as time goes on, you will find just as much use for the horse — the well-bred horse — as you have done in the past.

We need to keep the innovative pot boiling; a creative tension between maneuver arms and fire support is not only healthy but necessary. We have many things to fix in the combined arms; I would, therefore, enjoin all innovators in the field, in units, or in the institutions, to reject dogmatic answers and to press on. It is the ossified army that has stopped growing that is most easily defeated on the field of battle.

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How We Did It

In a recent article in *Infantry Magazine,* a contributor remarked that he had not seen many articles on how units could fight well together using the S3 as a pair of eyes for the commander on a different part of the battlefield. I never fought a real battle — with real bullets and real soldiers' lives at stake — but I had the opportunity to get as close as mech forces can get today by maneuvering around the NTC with the Cottonbalers of the 7th Infantry. My battalion commander, Lieutenant Colonel Rick Rhoades, allowed me to operate as his other pair of eyes — and it worked.

Doctrine is specific on who is supposed to be where on the mechanized battlefield of the NTC. The commander is on the decisive point; the XO is in the TOC, and the S3 is on the secondary avenue of approach or the supporting attack axis. While our battalion did not follow this particular bit of doctrine, we still learned to be winners anyway. The XO remained the deputy for logistics, and I was the deputy for operations. The XO's area of operations extended all the way from the brigade support area (BSA) to the forward edge of the battle area (FEBA), or the line of departure (LD). Mine overlapped his in the main battle area (MBA), but extended out into the zone of attack, or the battalion security area. With two pairs of eyes and ears on the battlefield, the Cottonbalers managed to become fairly efficient on the NTC battlefield.

We didn't accomplish the mission very well when we first defended the high ground north of Red Pass overlooking Siberia. It took us a while to get the routine tasks down to where the squad and platoon leaders didn't spend half their time on the small stuff. We didn't set any records, and in the noise of the after-rotation party at the beautiful NTC Officers Club patio, we were rated average by my OC. I felt that was pretty good at the time, and still do. "Average" means we learned a lot about ourselves and our abilities to lead when we were all pretty well blitzed with fatigue.

How we did "it" is not a simple thing to explain because the first thing the command group must

have is confidence in each other. And before soldiers can have confidence in each other on the battlefield (real or training, there should be no difference), they must enjoy confidence in each other in their daily lives in garrison. How that is attained is another story. We had it, and it transferred to our training battlefield.

Many publications state the battlefield of tomorrow will be a chaotic place, filled with small units carrying on the fight because they understand what has to be done. It took me a while to get on track with how it was going to be done in the 3rd Bn 7th Inf (M) Cottonbalers. I had to remember all the things I used to tell the Infantry Officer Advanced Course (IOAC) student about being a good listener and doing what the boss said. Eventually I came around, and we got down a pretty good timing of warning orders (WO), frags and a couple of 17-page operations orders (OPORDS). (For those yet 'unrotated,' you'll get your chance at the Pulitzer Prize OPORD.)

In our OPORDS, we didn't have an "Intent Paragraph." We do now. The boss and I agreed that the scheme of maneuver was his intent since it told everybody what to do and used terms that were simple and easy to understand. When I got done 'woofing the cosmic trash' (which I always taught my IOAC students NOT to do) in the OPORD, the boss always stood up and said what he meant in the terms that he and his company commanders were most comfortable with, based on their mutual experiences. Lots of you out there are saying, "So, what's new?" Nothing, really, except that I've seen a few commanders who could really whip the Air-Land Battle terminology on their company commanders, but since the company commanders hadn't been operating in a mission-oriented environment in garrison, they didn't (or weren't allowed) to understand. We did, and that's the part about confidence. The boss trusted me and allowed me to be his S3. If you don't have that, or your battalion commander won't let you be it, it's doubtful whether you can operate on another portion of the battlefield successfully.

We operated habitually with me on the second most dangerous avenue of approach in the defense and with the supporting attack in the offense. I coordinated for rearward passage of lines while the boss dealt with forward ones. I stayed and watched the last units out of the objective area while he went with the majority of the force.

By sharing these tasks, he developed a confidence in me that enabled him to let me make decisions on the other side of the battlefield when he couldn't see the action in front of me. The boss generally charged me with keeping the momentum up on the supporting axis when things began to get bogged down. By being well-forward with the company teams, I was in a position to urge a company commander to find a bypass around an obstacle or be in the advance party for coordination for passages of lines. Personal contact with the company commanders reaped the most benefit.

During one fight, only because I was able to move to and leap upon a tank team commander's tank, was I able to restrain his overzealous intent to prematurely launch a counterattack.

This brought a controller problem to light. I was asked by a controller, during a preparatory field training exercise (FTX) for Gallant Eagle 86, if I always went about the battlefield doing business without getting the approval of the TOC. When I asked him why he thought I needed approval of the TOC, he said his association with a couple of other leaders led him to believe that nothing ever happened unless the TOC was informed. When I pursued the subject with him, he related serving with leaders who would not allow a change in maneuver or shifting of forces without their personal approval. While it is obvious that this is the way we normally do business, (inform our boss of what we're doing sometime, either before or after we do it), I wondered what happened to those units when business was not normal. My bet is they didn't get business done very well.

Our confidence was further cemented after we won a few battles and soldier performance began to climb in proportion to our desert time. We had to worry about less and less as time went on. Major General Foss called it the road beyond the first ten days of combat, when all the mistakes are made and everybody gets the important SOPs drilled into their brains instead of bullets.

Now you ask, what was the Tactical Operations Center (TOC) doing while we were scurrying about the battlefield with our eyes and MILES on the OPFOR? They were doing what we wanted them to do: keeping brigade informed of our progress and planning future operations. Sadly, in the one instance when circumstances allowed the TOC to get a couple of courses of action put together — while we were in the midst of a defensive fight north of No Name Valley — and TOC managed to find a vehicle to get the assistant S3 out to see me, he was attacked by a SPETZNAZ outfit and killed.

The TOC's most important function was monitoring of the battalion and brigade nets, keeping brigade informed. When we began to frequency hop — to defeat the jammers — they went back to the old frequencies and policed up the stragglers. With a set of four code words that represented which frequency to be on, we were able to move very rapidly between the frequencies to stay ahead of the jammers. We got rather expert at it and used the same code words whether we were secure or not. This is an important point. Even if your VINSON works superbly every time, you must keep your unsecure code word system active in your tactical standard operating procedure (SOP). Once the lone rifle company commander on the right flank 'goes RED,' the code words come in very handy. If you have the net control station (NCS) enforce the use of the code words even when operating in the GREEN, it will become habit regardless of your radio status.

As one of the many tests in a rotation, the observer-controllers kill off the boss, the XO, and the S3 a couple of times. When they did, we were able to continue operations without too many hitches. There was the normal delay while the ALOC came up to reestablish the chain of command and get the TOC sorted out for the next move.

Normally, the demise of the boss was a tip to an impending disaster on or very near to the TOC, so we jumped often, especially when in the defense. As the XO took charge and prepared to get out onto the battlefield, I was trying to find out where the boss was, and after an unsuccessful search of no more than 5-10 minutes — depending on how close the OPFOR was — I would gather those still on the net

and issue any instructions to put us on track and get on with the mission. A quick net call and we would coordinate, either on the ground or on the air.

Habitual use of the alphanumeric for an NCS net call by the TOC is the only way to keep everybody on the net and awake. We tried several methods — such as other code words, like "guidons" etc. — but found out that stressing habitual use of the NCS net call, in all its simplicity, really did work.

During one attack that got choked up pretty badly trying to get south of White Pass, the boss got stuck in some rocks, then lost commo, then got hit with CS, rendering him ineffective. The TF continued to roll south to the objective, but got mixed up with some chemical smoke layers who — unbeknownst to us — were laying smoke for our sister TF attacking a different objective. Needless to say, their smoke didn't help us any. On the far side of it, we got our bearings back and pressed on. Eventually, those of us who made it to the objective had to have a short tactical conference in order to get the right force attacking the right part of the objective. In the fluidity of battle, I strongly recommend that you take time to have these little conferences. From these, much fog can be dispelled. Take the time for these little conferences; they help immeasurably, especially when everybody is tired, confused, and the enemy is not going anywhere soon.

Our mortar platoon leader taught me a lesson. In the heat of your tactical conference to sort out the final maneuver onto the objective, don't forget the smoke and fire support. He didn't let me.

As personal tools to use while serving as the commander's other set of eyes, I used a couple of nonstandard items which you don't see on every S3's track. Instead of a standard vehicle crewman's helmet, I used a set of headphones with the left earpiece taken off. Easily replaced, the earpiece was stowed in my track box. I padded the forks which retained the earpiece, as they were rather sharp, but this headset enabled me to wear the headphones either under my helmet or clasped onto the outside. With one ear exposed, it was easier to track battlefield noises and speak with others I would meet without having to take off the headset.

I connected myself to the radios with a coil cord that could stretch to 30 feet. This allowed me great freedom of movement, either out of the cargo hatch or through the back door. (No, in all my tactical time, no one ever slammed a door and cut it in half.) The long cord was a definite advantage if the action was very hot and both the brigade and battalion nets were very active and everybody wanted answers right now. I could sidle up to another track, get out and confer with the leader in his track, while still being able to respond to either command net.

I also carried two complete backup PRC77 radios, with batteries, regardless of where or when we were going on a tactical mission. As a matter of SOP, the commo sergeant always drew 10 spare PRC77s to be used as floats in the field. Spare cables to link the VINSON to the 77 were also drawn. On many an operation, these backup radios were lifesavers.

If information is power, then the only way to powerfully control anything is with good commo. I used to tell the signal platoon leader that he alone had the most important platoon in the battalion. After his platoon, came the platoon that fixed the commo and got it back to the people who needed to communicate. I recommend you treat your signal platoon leader the same way. It will reap untold benefits.

Communication, being vital to command (since one cannot command without communicating), is absolutely the single most important thing a unit needs to fight effectively. This startling thesis is not new. What is new is all the eager young soldiers and leaders out there, waiting for you to speak to them. They always will be new, because every time they move to a new job, join a new unit, or are promoted in position or grade, they must relearn all the old lessons. There are no new lessons, only new generations to learn them. We are the teachers/communicators/mentors of the old lessons. Only with effective communications can you become the other pair of eyes and ears for your commander.

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Infantry and Armor Cross-Attachments Enhance Combat Readiness

Effective and extensive combined arms operations are no longer a new concept to the U.S. Army, but rather a proven, sound operational method that will ensure success on the modern battlefield. More often than not, however, infantry, tank, and artillery fire support teams work together only infrequently and only during major training exercises, such as Reforger deployments and rotations to the National Training Center (NTC).

A realistic, mutal appreciation of the cross-attached unit's capabilities is never truly brought to light because of the short time frame in which the units will work together.

Secondly, because the leaders of the cross-attached units are unfamiliar with the weapons systems, maneuverability, and logistical requirements of their companion units, battalion task forces and tank and infantry company teams fail to use the full potential of their supporting attachments. To be thor-

oughly effective, six-month, semipermanent, cross-attachments of tank and infantry units, along with their fire support personnel, would significantly enhance the unit's combined arms combat readiness.

Field Manual 100-5, *Operations,* best describes the importance of training and implies that soldiers and their units will fight as they train. The manual states, "Soldiers must be prepared for combat both professionally and psychologically. Training is the cornerstone of success. Training is a full-time job for all commanders in peacetime, and it continues in wartime combat zones, regardless of other operations or missions. On the day of battle, soldiers and units will fight as well or as poorly as they were trained before battle. Soldiers receive most of their training in their units. There they can best train as individuals and as members of teams under conditions that approximate battle. Unit training aims at developing maximum effectiveness with combined and supporting arms."

By creating semipermanent cross-attachments of tank and infantry companies of battalions forming task forces, considerable training would be accomplished not only at the company level, but within the task force staff agencies as well. For example, the tank battalion's maintenance officer would now be concerned with the necessary quarterly services associated with a fleet of M113A2s or Bradleys. He would also have to consider managing the attached unit's peculiar parts requirements and their prescribed load list (PLL) stockage. The tank battalion's S3 would have to plan for Dragon gunnery and other training unique to the infantry.

In contrast, the mechanized infantry battalion's S4, along with his support platoon leader, would have to plan for the considerable Class III expenditure needed to support a tank company. He would learn that an M60A3 tank holds 380 gallons of diesel and requires 22 gallons of 10W oil in its transmission. Additionally, at the battalion staff level, all command and staff and training meetings would include the attached unit's commander. The mystery of having an unknown infantry or tank unit show up while on an important FTX would be eliminated, and the attached unit would be on hand for all operational planning.

At the company level, semipermanent, cross-attached infantry and tank platoons forming company teams would enormously benefit company-level combined arms training. An infantry company commander who had had a tank platoon for six months, as well as a permanent fire support team, would undoubtedly be better prepared to employ them on the battlefield than one who had never had any permanent exposure to a tank unit. Cross-attaching would also ensure soldier and unit morale, confidence, and increased effectiveness in dealing with supporting arms.

Challenging training programs could be developed at the company-team level to exploit fully the advantages of working as a combined arms team. For example, the infantry could undoubtedly convince tank commanders how vulnerable their tanks are during limited visibility, without local security, by conducting dismounted night attacks on tank assembly areas. Secondly, the infantryman's confidence could be built by digging a foxhole and having a tank straddle-drive over it, allowing the infantryman to jump up and engage it at close range with Vipers. Finally, the high volume of fire, the mobility, and the armored protection of the tank would demonstrate to the infantry how the tank could be best employed in combat and how the infantry would best defeat a tank in close combat.

By having the fire support team (FIST) permanently cross-attached to a designated tank or infantry company team, the company commander would have control of a valuable training resource. Classes could be given by the FIST team, either in garrison or in the field, on the capabilities and limitations of supporting arms. Moreover, the commander would have an indirect fire expert at his disposal as he plans his scheme of maneuver.

Every battalion commander knows that in fast-moving combat operations, it is essential for unfamiliar units to mount up and rapidly cross-attach with other units as the mission directs. Semipermanent combined arms cross-attachments in garrison are not meant to replace that combat requirement but rather to make it easier to do under fire. The familiarity of like units having had a lengthy cross-attachment experience in garrison would create the ability to reinforce other units rapidly and would ease many of the peculiar problems of logistics and maneuver.

Resources and unique training requirements, such as tank gunnery and competition for the Expert Infantryman's Badge (EIB) would probably require the cross-attached unit to return to its organic batttalion for training resource support. However, if the task forces were formed within their respected parental brigades, there would be little difficulty coordinating such events.

To train as we will fight and to fight as we have trained, semipermanent cross-attached tank and infantry units would not only reduce the mystery of each other's fighting abilities, but would enable battalion and company commanders to employ effective combined arms teams and greatly increase their units' combat readiness.

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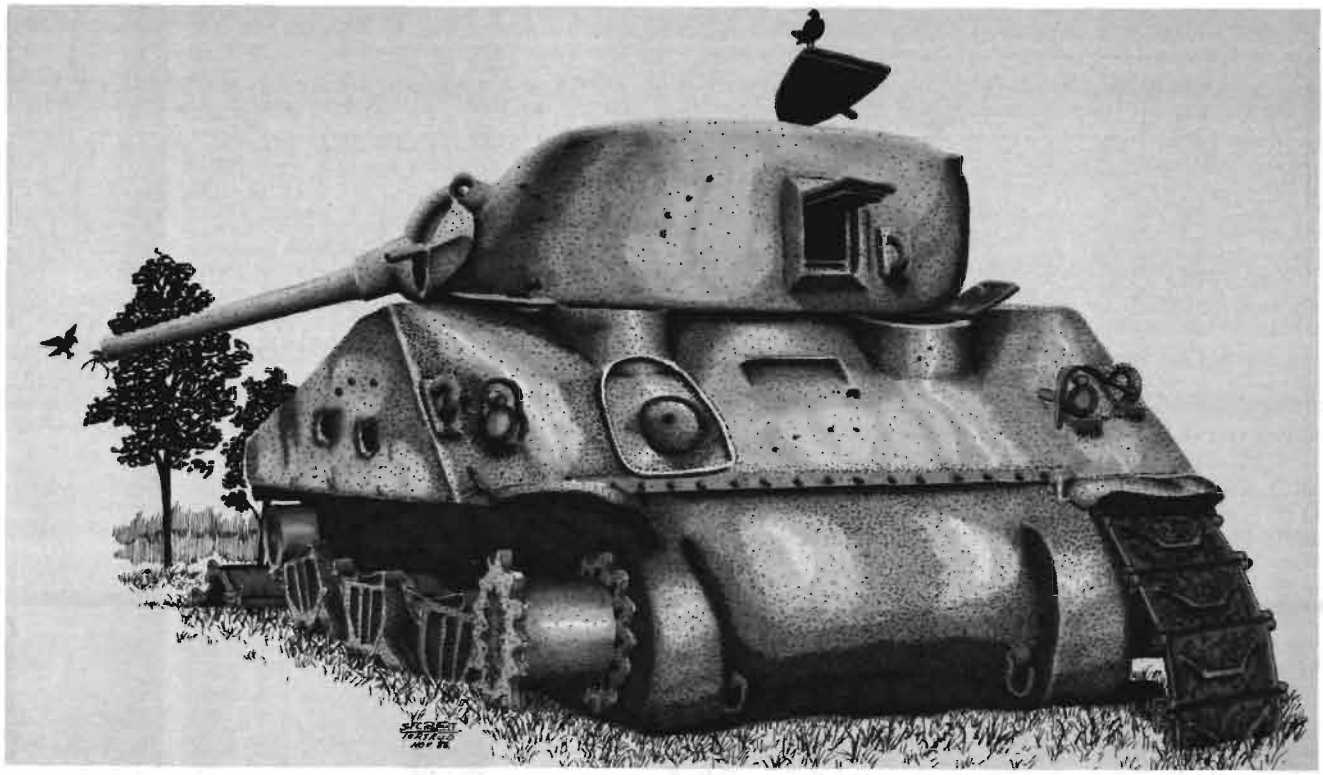


The Tank Is Dead Long Live The Tank!

In the beginning, Congress created the Army and the Navy. The pride of the Army was the cavalry, and the pride of the Navy was the man-o'-war. This blissful state of affairs lasted for over a hundred years. Then came the Twentieth Century...

With this new age came the birth of new weapons. The Army would venture above the surface of the land, with the airplane. The Navy would dive beneath the surface of the sea, with the submarine. The Army experimented with the "horseless carriage"; the Navy with the steamboat. But little real importance was attached to these fledgling weapon systems. After all, anyone with any intelligence knew that the airplane was too fragile to be used for anything but reconnaissance; the submarine was too slow to be a threat to surface ships; the automobile was too unreliable to replace the horse; and steam-powered vessels required constant refueling. But, as Frederick the Great said, "...war continually improves upon itself..."

The Army had the strongest and most emotional battle over the loss of the horse cavalry, because it was a complete change of lifestyle and tradition. Indeed, only the name remained, perhaps to provide a sense of continuity. (Traditions die hard, as can be seen by the cavalry troopers wearing spurs and Stetsons in Vietnam, even though none of them rode a horse into combat.) The primitive, unreliable, horseless carriage had evolved into the tank, which was faster and more powerful than an entire troop of horses — and more immune to the increasingly deadly battlefield. The machine gun had driven the horse cavalry from the battlefield, and in 1942 the War Department formally ended the U.S. Cavalry as a horse-mounted unit.

Although the Navy would lament the dying age of "fighting sail," their transition was easier. The big, wood-hulled, sail-drive "man-o'-war" was superseded by the bigger, steel-hulled, steam-powered battleship. A little of the glory was lost, perhaps, but the new battleships were intended for the same role as their predecessors — heavily armed ships designed to go "in harm's way" and slug it out with equally armed opponents. In this altered form, the man-o'-war managed to survive...until December 7, 1941.

The cavalry had only a few short decades to enjoy its renewed battlefield supremacy, brought about by the adoption of the tank. In October, 1973, Israeli tanks counterattacked Arab forces in a new Middle East war, and received a shock that must have been as devastating as that experienced by the first horse cavalry that charged into machine gun fire sixty years earlier. Many "experts" have questioned the usefulness of the tank since, but there is an emotional attachment to the tank (in the Army) very much akin to that displayed by the Navy for the battleship. Indeed, there are interesting parallels in the development of the tank and the battleship.

In the Russo-Japanese War of 1905, the typical battleship displaced 15,000 tons and mounted 12-inch guns. By the end of WWII, the U.S. fast battleships had 16-inch

guns and dressed out at about 45,000 tons. Ironically, the country that proved in December, 1941 — with crushing finality — the superiority of the "fragile" airplane over the armored dreadnought, built the biggest sea-going "target" of all. The Yamato displaced over 70,000 tons when fully loaded, and mounted the largest (18-inch) guns ever sent to sea. This super-dreadnought was designed from the keel up to outfight and absorb more hits than any other ship afloat. It, too, was sunk by (U.S.) airplanes, in 1945.

The story of the tank is strikingly similar. In 1941, the German PzKpfw II carried a 20-mm main gun and weighed in at about 7 tons. In the same year, the U.S. M3 Stuart mounted a 37-mm gun, at a weight of 14 tons. Our most widely used tank in WWII — the M4 Sherman — had a 75-mm gun. The tank battalions in Vietnam all used the M48 Patton, which had the 90-mm main gun and weighed some 50 tons. Now enters the M1 Abrams, at *60 tons* and soon to have a 120-mm main gun! This "super tank," with its state-of-the-art technology, was designed from the suspension up to outfight and absorb more hits than any other tank in existence. Sound familiar?

The battleship met its end not from the gunfire of equally armed and armored opponents, but from a weapon so small and delicate in comparison, that the result seems totally absurd! But, history is very clear on the outcome of a battleship/airplane contest. The case is not yet closed on the tank/missile question, but the evidence is convincing. The best antibattleship weapon *was* another battleship — until the airplane reached a certain critical point in its development. The man-portable antitank missile may soon reach that critical point, too, and then it will no longer be true that "the best antitank weapon is another tank." (We think that critical point is the development of a lightweight, "fire-and-forget" self-guided missile. The TOW is very potent, but it is not truly man-portable.)

Perhaps it should be stated that we are *not* arguing against the tank — we are arguing against the tank *as it now exists*. The basic philosophy of tank design and use has not changed in almost half a century. If this situation is allowed to persist, the tank may very well follow the horse into oblivion. After seeing M48s, Sheridans, Australian Centurions, and the ever-reliable M113s in action in Vietnam, and studying more recent conflicts, we think that a light tank is necessary if Armor is to play a significant role in future actions.

At present, main battle tanks are of decided value in the face-off with the Warsaw Pact, but *their worth lies primarily in deterrence*. There has not been combat in Europe in four decades...and it seems unlikely that there will be war there in the foreseeable future. *Yet this is precisely the kind of war we are spending almost all of our resources to prepare for!* Of course, we dare not ignore the *potential* for war in Europe, but there is a proven certainty of combat in other arenas that we are not adequately prepared for with only main battle tanks in our inventory.

Most military involvements of the technological nations during the last twenty years have been of characteristically short duration, usually measured in days or weeks. The Arab-Israeli wars (1967, 1973), the Falkland Islands (1982), and Grenada (1983) are prime examples. The last two were almost exclusively the domain of light infantry; M1s in Grenada would not have been cost-effective, but a handful of light tanks could have been much more easily delivered to the island. In the Middle East wars, large numbers of main battle tanks have seen use, and there the M1 would undoubtedly have given an outstanding performance against any enemy. However, it would take weeks (or even months) to deploy a credible force of M1s and by then the war might already have been lost! Any "rapid deployment force" must be air-transportable. Since any aircraft that could carry a 60-ton Abrams could carry two 30-ton light tanks, adopting a light tank would deliver double the firepower per aircraft sortie. Having such firepower available at the start of fighting would greatly increase the survivability of the RDF.

Of even greater importance is that the concept of combined arms operations has been ignored in tank design. Present doctrine requires that a tank unit fight alongside an infantry unit — together, yet still separate. Since tanks can seldom operate (except at great risk) without infantry support, why not carry infantry *in the tank*?! This would give distinct advantages: Lower equipment costs and more efficient use of manpower being the most important. If, for example, a combined arms team consists of five tanks (each with a 4-man crew) and five IFVs (each with a 3-man crew and 6 infantrymen), there is a total of 10 armored vehicles, 35 crewmen, and 30 infantrymen, but only *five* main guns with antitank capability. With a tank designed to carry its own onboard infantry, supposing a crew of three (automatic loader for the main gun) and four infantrymen, and we could have a combined arms team of 8 armored vehicles, with 24 crewmen, 32 infantrymen, and *eight* main guns with antitank capability. By adopting the Combined Arms Tank (CAT), firepower would actually increase by an incredible 60 percent while decreasing the number of vehicles by 20 percent! Infantry strength increases by a modest 7 percent, while total personnel requirement decreases by a considerable 14 percent. In an era of rising costs, such figures cannot be taken lightly. As a light tank, it might be possible to make the CAT amphibious, further enhancing its tactical potential. Furthermore, carrying its own infantry not only gives the tank an integral security force, but should also foster increased cooperation between the tank crew and the infantry. In addition, in a defensive position or an ambush, the tank's firepower can be augmented by four infantrymen firing antitank missiles.

The Bradley IFV could be considered the forerunner of the Combined Arms Tank; lightweight, infantry-carrying, and armed with a small-bore cannon. But, as with the M1 tank, the IFV is only a partial answer, and is inadequate to the tasks that the Army will be facing in the future. A tank alone is easy prey for infantry. An IFV alone is too vulnerable to enemy tanks. A marriage of the infantry fighting vehicle and the main battle tank would produce a combat vehicle superior to both for the needs ahead.

The (main battle) tank is dead. LONG LIVE THE (COMBINED ARMS) TANK!

CPT HAROLD L. SPURGEON
Los Osos, CA

STANLEY C. CRIST
San Diego, CA

Brigadier Simpkin, Armor Author, Linguist, Is Dead at 65

Brigadier Richard E. Simpkin, MC, OBE, respected and erudite armor officer, teacher, linguist, and author, died on 3 November 1986 at Elgin, Scotland.

He was born on 21 April 1921 and received his education at Winchester College and Trinity College, Cambridge, where he was studying for a medical career with a specialization in biochemical research. When WW II broke out, he joined the Royal Tank Regiment, saw action in the Middle East, was awarded the Military Cross (MC), and was captured. As a POW, Simpkin studied French and German, becoming fluent in both languages. He was also fluent in French and Italian and read Russian.

After the war, Simpkin served in Germany and England, where he specialized in technical, industrial, and economic intelligence. He graduated from the Royal Staff College in 1951 and from the Technical Staff Course, Royal Military College of Science, with a specialty in vehicles in 1953. From 1957 to 1959, Simpkin served as an instructor in combat vehicle technology at both of these institutions.

From 1960 to 1963 he headed the Equipment Branch of the Royal Armoured Corps Directorate. During his tenure, Simpkin was responsible for the user trials of the Chieftain main battle tank and for the operational requirements of the Scorpion reconnaissance vehicle family and the Swingfire AT guided weapons system. For these works he was created an Officer of the Order of the British Empire (OBE).

Simpkin then returned to field duty and assumed command of the 1st Royal Tank Regiment in Germany and Aden. Following this command, he returned to the Royal Military College of Science as Military Director of Studies (weapons and vehicles), and was promoted brigadier. (Ed. Note: A brigadier in the British Army does not equate to a brigader general in the U.S. Army. A British brigadier commands a brigade.)

Simpkin next became Director of Operational Requirements 3 (Army), at the Ministry of Defence where — among other duties and responsibilities — he was involved with the exploitation of Chobham armor.

Brigadier Simpkin chose early retirement in 1971 after 30 years' service and organized a language consultancy that he expanded to ELS Consultant Linguists, Ltd. in 1973 at Elgin, Scotland. It was at this time that Simpkin began writing books and articles. He first wrote on the uses of languages in business and then authored a book on offshore sailing (he was a Royal Yacht Association Yachtmaster — Offshore).

Simpkin's first military treatise was *Tank Warfare,* published in 1979. That volume established his reputation as an armor authority. In 1980, his *Mechanized Infantry* appeared, and in 1982 he published *Antitank,* followed in 1983 by *Human Factors In Mechanized Warfare.* A year later, he produced *Red Armour,* and in 1985 *Race To The Swift.* His last book, *Deep Battle, The Brainchild of Marshal Tukhachevskii,* is to be published this year. Simpkin's works are highly regarded in professional military circles and enjoy wide distribution. He also wrote many articles and professional papers for leading defense and military periodicals throughout the Free World.

ARMOR Magazine has been honored to have printed no fewer than nine of Brigadier Simpkin's armor articles from 1980 to 1985. He has appeared as guest lecturer at the U.S. Army Armor School at Fort Knox, KY, on several occasions, the last being 19 May 1985.

His *ARMOR Magazine* articles are: "A New Proposal For Fighting Vehicles," (Nov-Dec 80); "An Airborne Mechanized Force For The 80s," (Jul-Aug 81); "Closing The Survivability Gap," (Nov-Dec 81); "The Future Of Swedish Armor," (Jul-Aug 82); "The Broad And Narrow Of It," (Jul-Aug 83); "Task-Configured Fighting Vehicles," (Nov-Dec 83); "Living With Tanks," (Mar-Apr 84); "Room At the Top," (Jan-Feb 85), and "The Heavy Force/Light Force Mixup," (Jul-Aug 85).

In June 1981, Brigadier Simpkin spent a week in Sweden at the invitation of the Swedish Army Materiel Department and lectured at the Swedish Armor School, the Royal Academy of War Sciences, and at the Bofors ordnance firm.

In 1982, he took part in discussions with ARMEX, The British Army's "think tank," similar to the U.S. Rand Corporation, and later was the principal speaker at the RUSI's Fuller/Liddell Hart Memorial Symposium on The Future of Armoured Warfare.

In March 1983, he spoke before the First Annual Officer Development Symposium of the Combat Training Centre at Gagetown, New Brunswick, Canada, and later gave a series of talks on the theory of land warfare at the U.S. Army War College.

In addition to his varied and creative professional life, Brigadier Simpkin led an equally-varied private life. He was a skilled yachtsman, fly fisherman, hiker and photographer, and enjoyed pre-baroque and baroque music.

He is survived by his wife, Barbara, whom he married in 1941, and a daughter and two sons.

Recognition Quiz Answers

1. **T-62 MBT (SYRIA).** Crew 4; weight, 40,000 kg (44 tons); maximum speed, 50 km/hr; maximum road range, 450 km; engine, V-55 V-12 water-cooled, 580-hp diesel; armament, 1 x 115-mm main gun, 1 x 7.62-mm coaxial and 1 x 12.7-mm AA machine guns.

2. **T-80 MBT (USSR).** Crew, 3; weight, 48,500 kg (53 tons); maximum road speed, 70 km/hr; cruise range, w/200-liter auxiliary tank, 450 km; engine, liquid-cooled 750-hp diesel; armament, 1 x 125-mm main gun, 1 x 7.62-mm coaxial and 1 x 12.7-mm AA machine guns.

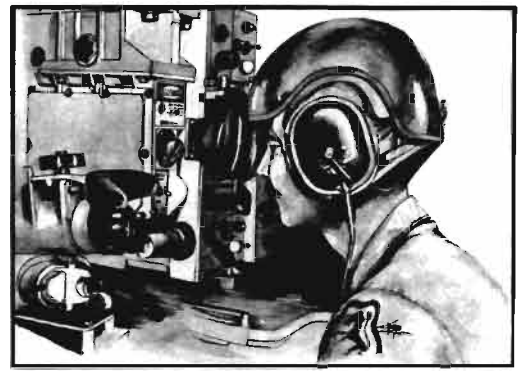
3. **M1973 152-mm SP Gun/Howitzer (USSR).** Crew, 6; weight, 23,000 kg (25 tons); maximum road speed, 55 km/hr; maximum road range, 300 km; engine, V-12, liquid-cooled, 520-hp diesel; armament, 1 x 152.4-mm main gun, 1 x 7.62-mm AA machine gun.

4. **T-54/55 Flame Tank (USSR).** Crew, 4; weight, 36,000 kg (40 tons); maximum road speed, 50 km/hr; maximum road range, 500 km; engine, V-55 V-12 water-cooled 580-hp diesel; armament, 1 x 100-mm main gun, 1 x 7.62-mm machine gun, 1 flame gun coax with main gun, maximum range, 150/200 meters, effective range, 100 meters.

5. **M109 155-mm SP Howitzer (U.S.).** Crew, 6; combat weight, 23,786 kg (26 tons); maximum road speed, 56 km/hr; maximum road range, 390 km; engine, Detroit Diesel 8V71T, two-stroke, turbocharged, liquid-cooled 405-hp, 8-cylinder; armament, 1 x 155-mm main gun, 1 x 12.7-mm AA machine gun; maximum main gun range, 14,600 meters.

6. **AM General HMMWV (U.S.).** Crew 1 + 3; loaded weight, 3,870 kg (4 tons); maximum load, 1,134 kg (2,500 lbs); maximum towed load, 1,542 kg (3,400 lbs); maximum speed, 105 km/hr; maximum road range, 563 km; engine, V-8 6.2-liter, air-cooled diesel; air transportable, 4 x 4 drive; armament, varies with mission from 12.7-mm machine gun to TOW launcher.

Modifying Tactical Tables As Diagnostic Tools



by Major James A. Dunn, Jr.

and First Lieutenant Mark Arbury

The Tank Tactical Tables contained in the Tank Gunnery Field Manual (FM 17-12-3) are a well-thought-out set of exercises that teach tank crews how to become "killer Crews" and platoons and the importance of momentum and maneuver, while reinforcing gunnery techniques. However, units can further modify the tables into an excellent diagnostic tool to identify current training strengths and future training needs and to provide the battalion commander a "snapshot" view of the combat readiness of his tank platoons.

Not wanting to "re-invent the roadwheel," our S3 section researched how best to use the tables. Obviously, a full-blown platoon ARTEP evaluation would meet the requirement and would stress the platoons by requiring them to perform under realistic conditions. But we did not select that method because the participating platoons had just returned from a rigorous REFORGER exercise in which their sustainability and ability to perform a myriad of missions had been tested. Instead, we saw the Tactical Tables as an excellent starting point from which to evaluate the platoons' skills at maneuvering, shooting, and surviving.

We quickly saw, however, that the tables did not address all the areas we needed to check. Specifically, there were no tables/exercises that examined preparation for combat (e.g. pre-combat checks, platoon leader planning, OPORD preparation and issuance), typical combat drills (e.g. minefield breaching, hasty decon, hasty attack), and reporting. We believed an evaluation of these areas to be significant to a true picture of the current status of the platoons' combat readiness. At the same time, we needed a framework which evaluated the platoons' abilities to "put steel on target." Table I of the Tactical Tables, provided that framework.

Methodology

Tables I and H are the "run" stages of the Tactical Tables. To get there, the tank platoons need to demonstrate proficiency in the preceding tables (A, B, D, G, C, E, and F, in that order). Several of these tables are easy to accomplish at crew/platoon level in garrison.

The First Stage is the conduct of the following tables by the lieutenants and sergeants of the platoons:

- Table A — Individual/Crew Member Task
- Table B — Crew Drills
- Table D — Wingman Drills
- Table G — Platoon Battle Drills

Simple training aids (e.g. vehicles in the motor pool, sand tables with model tanks, etc.) enhance this level of training and make it easy for junior leaders to organize and conduct the training with a minimum of resource expenditure. Extensive use of SOPs and battle drills during this stage will pay dividends later. Platoons should "talk through" these tables and discuss why they did what they did in each situation. These informal, platoon-leader-led "after-action reviews" will prompt the platoon's members to get involved in the exercises. Often, the question asked by a loader, or the suggestion from a driver, is a key teaching point for the entire exercise. These discussions often drive modifications to SOPs and battle drills, and involve the entire platoon in the development of the actions that they will have to take on the battlefield.

The Second Stage can be conducted on sand tables, but platoons get more benefits from completing the exercises in the field. Three tables make up this stage:

- Table C — Crew Reaction Exercise
- Table E — Wingman Drills
- Table F — Wingman Reaction Drills

The "evaluators" here are the company master gunners. These highly-skilled NCOs ensure that the tables' standards are high but attainable. Full pyrotechnic support and the use of "live" MILES-equipped targets provide the best training, but are not absolutely necessary. During this stage, the company can provide its own OPFOR and evaluators or TCEs. Individual tanks and sections should complete the published tasks, and any other that the commander/master gunner believes are appropriate, to the standards in FM 17-12-3. After-action reviews should address all that went right as well as that which went wrong, and why. Individual crew members should explain what they saw and what they did, or didn't do, during the exercise. Then the commander should ensure that the platoon discusses these points in terms of lessons learned. Make sure that the platoon has time to "internalize"

these lessons before progressing on to the next stage.

The Third Stage is composed of two tables which first give the platoon a "practice run" and then evaluate the platoon:

- Table H — Platoon Reaction Exercise
- Table I — Platoon "Evaluation"

We saw Table H as a "practice run" similar to Table VII of the Gunnery Tables. Table H also provided the OPFOR an opportunity to practice their tasks prior to the conduct of Table I. Elements of the battalion's scout platoon, mortar platoon, support platoon, and HHC were the OPFOR for Tables H and I. Although the complete OPFOR was of significant size, (approximately 40 people and 12 vehicles), the advantage of having MILES-equipped vehicles and thinking OPFOR crew members provided important benefits.

We equipped OPFOR combat vehicles with their appropriate MILES kits, and OPFOR soldiers wore Man-Worn Laser Detection (MWLD) kits. When we needed a greater density of personnel targets, we supplemented the soldiers with troop-sized silhouettes. Vehicles and targets without MILES kits (i.e. 2½-ton trucks, tents, helicopter panels) had torso harnesses from the MWLD kits attached to them so that we could determine target effect. Such instrumentation helped to eliminate arguments over the number of hits achieved by the platoon.

At the end of each task or engagement, the NCOIC of that task physically counted the vehicles, personnel, and silhouettes whose buzzers had been activated by the platoon's lasers. This count provided an accurate evaluation. For vehicles/targets that did not have a Combat Vehicle Kill Indicator (CVKI), a pyrotechnic signal (i.e. green smoke) gave the firing platoon a visual signal that the target had been hit or suppressed. Additionally, SAAB targets were lowered when their torso harnesses' buzzers were activated. All OPFOR weapons were MILES-equipped and provided with firing signatures in the forms of ATWS pyrotechnics or hand grenade simulators. Close coordination between an OPFOR controller and the OPFOR between engagements/tasks provided for a well-coordinated and effective target presentation for the tank platoon negotiating the table.

The Evaluation — Table I

To modify Table I in order to make it a more realistic evaluation of the tank platoon's combat readiness, we added the following tasks:

- Occupation of an Assembly Area
- Platoon Hasty Attack
- Conduct a Deliberate Breach of an Obstacle

Other than the "Occupy an Assembly Area" task, the tasks of the table were arrayed randomly along the "lane" that stretched approximately 9 kilometers over a variety of terrain. The mission that the platoon received at the beginning of the exercise was that of a rear area combat operations (RACO) nature. The order specified that the platoon had to clear a route/zone that contained fragmented enemy forces. This zone contained a route that was to be a future main supply route (MSR). Using this RACO scenario made the kinds of targets the platoon encountered more realistic and permitted the platoon to operate independently. The platoon's company commander transmitted all orders to the platoon and positioned himself to observe the platoon's performance.

The platoon first received a frag order which required the occupation of an assembly area. This occupation was evaluated by senior armor sergeants who used checklists derived from ARTEP 71-2 and the appropriate unit's SOPs. Additionally, the evaluators checked load plans, NBC procedures, security, and the maintenance of hulls, turrets, radios. Standards were tough, and any MILES deficiency was evaluated as a fire system deadline; hence, if the MILES didn't work, the tank couldn't "fire." During this phase of the evaluation, the platoon "captured" and processed a POW. (We also inserted this task into the Hasty Attack phase.)

While the evaluation of the platoon's occupation of the assembly area continued, the platoon leader back-briefed his platoon OPORD to the chief evaluator (i.e., an armor captain or master sergeant/sergeant major). The platoon leader had received his company order, with graphics, no less than eight hours prior to movement into the assembly area to give the platoon leader plenty of time to prepare his own OPORD. Upon completion of the delivery of the platoon order to the platoon and the occupation of the assembly area, the platoon was ordered to move out on its mission.

The chief evaluator, the OPFOR commander, and task NCOICs all participated in the platoon's evaluation. OPFOR targets not killed because of poor gunnery or lack of target detection were counted against the platoon. This sort of evaluation reinforced the importance of boresighting/zeroing and active participation of all platoon members in locating targets. The standards came from FM 17-12-2 and ARTEP 71-2. The target sequence changed for each platoon to ensure against "G2-ing" the course. Evaluators rated each engagement as "sustainment training needed" (S), "moderate training needed" (M), "intensive training needed" (I). After the completion of the table, the platoon received a detailed AAR at which the company commander, the battalion S3, and battalion commander were present.

Using Table I in this way can easily lead to determining a "Top Platoon." This extra, competitive incentive proved healthy as platoons rehearsed their battle drills and techniques so that they could outperform their peers. Platoon sergeants triple-checked their tanks' load plans while crew members intensively discussed their actions in different drills.

This evaluative exercise, originally designed to provide the battalion commander with a "snap shot" of his platoons, ended up being also a terrific motivator and training event for the platoons. Observers could feel the "electrical excitement" during the conduct of the table when crews performed extraordinary feats to accomplish the mission as quickly and as effectively as possible. Motivated and involved tankers were the participants in the AARs. They discussed their actions and how to perform better next time. These unexpected payoffs, combined with the intended objective, provided an outstanding training event that both evaluated and improved the combat readiness of the battalion.

Major Dunn and Lieutenant Arbury are assigned to the S3 section, 3d Bde, 4th ID (Mech), Fort Carson, CO.

REGIMENTAL REVIEW

The MIRADOR multi-sensor remotely-controlled minefield reconnaissance and detector system is shown here in an artist's concept sweeping a road for mines and controlled from the jeep in the background.

Minefield Recon & Detector System Contracts Let

Gould, Inc., of Glen Burnie, MD, and Foster & Miller, Inc., of Waltham, MA, have received contracts totaling $8.1 million to develop prototypes of a highly mobile, remotely-controlled Minefield Reconnaissance and Detector System (MIRADOR). The U.S. Army Troop Support Command Belvoir Research, Development and Engineering Center will be the proponent organization for the program.

MIRADOR will be a multisensor system designed to detect metallic and non-metallic mines both on and off roads. It will be used in forward and rear areas and will be capable of being either remotely or manually operated. Combat engineer, infantry, and armor units in support of maneuver force operations will use the new device, said the Belvoir RD&E Center. Prototypes will be delivered to Aberdeen Proving Ground, MD, for testing in November 1987.

Reserve Component Advance Course Dates Announced

All Reserve Component officers currently enrolled or considering enrollment in the Armor Officer Advance Course (Resident/Nonresident) should be aware that the dates for the conduct of the active duty phases (II and IV) have been announced and are as follows:

Phase II	17-30 May 1987; 31 May; 13 June 1987
Phase IV	14-27 June 1987 and 28 June-11 July 1987

The above phases will be taught at Fort Knox, KY, and enrollment is limited to approximately 60 students per iteration. Interested officers may direct inquiries/applications through the chain of command, for unit members, or directly to the Branch Office, for members of the Individual Ready Reserve (IRR). Officers may direct questions to their personnel management officer (PMO) at ARPERCEN by calling 1-800-325-4953/5 if they are not sure of their current status. Captains being boarded for promotion to the next higher grade must have the advance course completed prior to the date the board convenes in order to be considered.

1987 Armor Conference
Tentative Agenda

19 - 21 May 1987

Tuesday, May 19

0900-2200	Registration (Officers Club)
1300-1645	Displays
1645-1730	Retreat Ceremony
1800-2000	Chief of Armor Garden Party
2030-2200	Regimental Assemblies

Wednesday, May 20

0700-0900	Late Registration (Gaffey Hall Library)
0800-1100	Opening Remarks - MG Tait Keynote Address: (GEN Vuono) Report to the Force (MG Tait) Field Presentations (TBD)
1100-1145	Armor Association General Membership Meeting
1145-1300	Executive Council Armor Association Luncheon
1300-1530	Field Presentations (TBD)
1530-1800	Displays
1900-2200	Armor Association Banquet (GEN Otis)

Thursday, May 21

0800-1145	Presentations (TBD) Chief of Armor Luncheon (TBD)
1330-1500	Presentations (TBD)
1500	Closing Remarks - MG Tait

POC for G. O. and Presenters Billeting: USAARMC Protocol Office AV 464-6951/2744
Billeting for other personnel: Housing at AV 464-3138
Transportation will be provided from Standiford Field
POC for Equipment Displays: DCD, Major Gehr, AV 464-1750
Estimated Cost of Social Events: $30.00
Uniform: Class "B"

Modern War Studies Series Open

The University Press of Kansas is seeking proposals and manuscripts for consideration in its new Modern War Studies series, says Michael Briggs, acquisitions editor.

Series editors intend to encompass the period from the mid-Eighteenth Century to the present, be international in scope, and embrace such topics as operations, biography, strategy and politics, civil-military relations, institutional, organizational, and social history, and the impact of technology on warfare.

Interested persons should contact Mr. Briggs at: University Press of Kansas, 329 Carruth, Lawrence, KS 66045.

11th Armored (Thunderbolt) Div. Reunion

The Thunderbolts will hold their annual reunion on 12-16 August 1987 in St. Louis, MO. Interested persons should contact: Alfred Pfeiffer, Secy-Treas., 2328 Admiral St., Aliquippa, PA 15001.

BOOKS

Five Insights Into The Vietnam War

The Armored Cav's Fight

RINGED IN STEEL, by Michael D. Mahler, COL, USA (Ret.). Presidio Press, 31 Pamaron Way, Novato, CA. 214 pages. $16.95.

Ringed In Steel is the personal account of Colonel Michael D. Mahler's tour in Vietnam. He served as a brigade S1 and a cavalry squadron executive officer from August 1967 to August 1968.

Colonel Mahler's story is of the personal experiences and feeling of a soldier at the unit level. It does not probe the high-level strategies and thinking or the "what might have beens" so common to military histories. Throughout the entire book only the areas of operation are named. This anonymity of people and units allows the reader to view the timeless lessons taught by the book more objectively and less emotionally. The student of the Vietnam War and the soldiers who fought there will no doubt recognize many of the people and events featured.

Though the book is a well told and insightful story, it's greatest strength lies in the value of the lessons it can teach. A point made throughout is that the things which we practice and do well in peacetime training will result in success if practiced in war. It sounds pretty simple, but several examples of ignominious operations are given where careless or inadequate planning and execution resulted in unnecessary loss of lives, equipment, and in some fortunate incidences, only time and egos.

The author tells how an armored cavalry squadron was brought up to a high state of combat proficiency by careful planning and attention to detail or simply put, doing the basics which they had all been taught. The book covers many aspects of the cavalryman's war in Vietnam which are not as well known as the infantry or the air wars. Vehicle recovery operations which are such a routine and commonplace part of daily armored operations were a tense and dangerous business which took on all the complexities of a tactical operation. We are taken on the countless antimining patrols along the critical supply routes and on the tedious and often deadly escorting missions along those same routes.

Colonel Mahler's squadron was involved in the Tet Offensive of January 1968. An excellent account is given of the squadron's part as well as that of other armored force's. Frank opinions are also given of the media's role in the public's view of the Tet Offensive. In fact, a number of the myths about Vietnam, propagated by the media, are challenged in the book.

This is an excellent book and a tribute to the armored soldier who fought in Vietnam. I would recommend it as must reading for any student of the war as well as all mechanized and armored leaders.

JAMES E. HANDLEY
Captain, Armor
Marion, Alabama

The Junior Officer's Fight

ONCE A WARRIOR KING, by David Donovan. Ballantine Books, NY, NY, 1986. 339 pages. $3.95.

With the plethora of "I remember Vietnam" accounts currently on bookshelves, the professional soldier has good reason to be skeptical of their quality, accuracy, and appeal. Refreshingly, Donavan's book, *Once A Warrior King,* is not just another attempt to cash in on national remorse, but a serious effort by a former Army officer to reflect on his combat experience. In telling us what his Vietnam memories mean to him, Donovan has written a book that provides real insight for those who have yet to experience the difference between leading men in peacetime and leading them in battle.

From the opening pages when he served as assistant leader and subsequently chief of a MAT team in Kien Phong Province of the Mekong Delta, Donovan shows that the highly touted "Book" upon which he has been taught to depend had few answers pertinent to the realities of combat. The author illustrates this lesson painfully in describing the dilemmas he faced concerning his commander and later, a senior noncommissioned officer. How does an officer remain loyal to his commander — as he must — when that commander appears bent on self-promotion to the point of sacrificing the lives of soldiers? Or how do you handle a senior NCO who, after months of valorous and selfless service, briefly loses control and assaults an officer? For LT Donovan, the answers lay in his determination to uphold the intangible notion of "brotherhood of arms." He overlooked the transgressions of his brother soldiers, remaining loyal to them despite what they had done.

Some might take issue with Donovan. But whether the conclusion reached by LT Donovan was correct is irrelevant to the value of the book. The real value of the book lies in the author's ability to portray honestly and in great detail the perplexing challenges that went along with being a warrior. If Donovan reaches one overriding conclusion, it is that in combat personal character and common sense, not someone else's "rules," are decisive to success and survival. This is a startling and difficult conclusion to accept for many young officers who may tend to look to the "Book" for answers to their dilemmas, even in the relatively safe confines of the peacetime army.

Recommended highly for junior officers who want a distinctly different perspective of what was happening in the jungles of Southeast Asia, this work will grab at the senses and involve the reader in every gut-wrenching situation, even as it leaves him sharing the frustration of the all-powerful Warrior King who could not finish what he had come to accomplish.

TERENCE J. HILDNER
1LT, Armor
2/3 ACR
Ft Bliss, TX

The Infantryman's Fight

RICE PADDY GRUNT: UNFADING MEMORIES OF THE VIETNAM GENERATION, by John M. G. Brown. Regnery Books, 1986. 356 pages, $18.95.

Rice Paddy Grunt is a straight-forward story telling what it was like for one individual before Vietnam as a citizen and then as an infantryman in Vietnam. John Brown wakes up the people who were never there, but gives them the feeling of being there and living the day-by-day horror and hell of an infantryman. And the men who lived through it as an infantryman will be taken back.

The story did this for me even though I was stationed at I Corps with the United States Marine Corps as an infantryman. While the geographical areas were not the same, the experiences that Brown relates in his book were remarkably similar to mine.

The book takes you month-by-month through the stench, heat, sweat, pain, and death as John Brown and his fellow infantrymen lived through the war. His gut-wrenching description leaves nothing to the imagination.

But Brown's story does not end with the war alone. He continues with his stateside return with its cold welcome and its

unrest amongst the younger generation protesting U.S. involvement. This book is a must for those who really want to know about Vietnam and relive the unrest of the '60s.

To sum up, I would like to quote a small portion of a writing by a Vietnam Veteran that I ran across some years ago. "In World War I, he was called a 'doughboy'. In World War II, he was 'GI'. Now in Vietnam, he's called a 'grunt'. It's not a pretty name, but then neither is an infantryman's lot. It is a twenty-four a day working, sweating, grunting job. But believe it or not, he's sort of proud of the name — 'grunt'."

SFC ROBERT TORSRUD
Fort Knox, KY

The Marine's Fight

PAYBACK: FIVE MARINES AND VIETNAM, by Joe Klein. Ballantine Books, New York, 412 pages. $3.95.

PAYBACK is the story of five of the men who served in Charlie Company, 1st Battalion, 3rd Marine Regiment in August 1967. Gary Cooper, John Steiner, John Wakefield, Bill Taylor, and Dale Szuminski were not typical Vietnam vets. All enlisted in the Marines; all were white. This is not a combat narrative; rather it is a character study of the five men — who they were and who they are today.

Until journalist Joe Klein became interested in the life and death of Gary Cooper, he had not thought very much about the men who fought in Vietnam. His view of vets was shaped by the Vietnam Veterans Against the War protest in 1971 and media reports which implied an impression of violent, angry men bordering on the edge of sanity. Reports of Gary Cooper's tragic death confirmed Klein's negative assessment. However, his research for a magazine piece about Cooper led him to alter his feelings about veterans.

Klein became interested in the men who had served with Cooper in Vietnam, and he eventually located and interviewed twenty men from Cooper's unit. As he talked with these men, Klein discovered that most appeared to be fairly normal and were living useful lives. None had returned from the war entirely unscathed, but their problems were not all products of the war. Agent Orange, post traumatic stress syndrome, and the ill treatment of Vietnam vets were factors in people's lives, but Klein emphasizes the normal difficulties encountered by men who grew up and live in the working class. Each of the five men treated had a unique personality, handled his stress in his own way, and adjusted in his own fashion.

This is a fascinating book. The men are treated with compassion and respect, and their differing views about the war and life afterward are presented fairly. Klein's attempt to demonstrate the diversity among individuals who served in Vietnam makes this a worthwhile study.

JEANETTE R. DUNN
Director of Development
Spartanburg Day School
Spartanburg, SC

The Airman's Fight

Herbicidal Warfare: The RANCH HAND Project in Vietnam, by Paul Frederick Cecil. Praeger, New York. 1986. $29.95.

Hard-charging tankers and cavalrymen should not be put off by the title of this book. In terms of interest and insight, *Herbicidal Warfare* delivers much more than it seems to promise.

Paul Frederick Cecil is a retired Air Force officer writing about *his* war in Vietnam. Cecil fought his war as part of a small company of brave pilots who flew ungainly C123s while dumping an ocean of herbicide on enemy-controlled jungle and croplands across Indochina. The author's concise and straightforward narrative pieces together the story of OPERATION RANCH HAND from the tentative experiments of the early 1960s through the program's termination amidst a blaze of media-fanned criticism in 1971. It is a fascinating history from more than one point of view. First of all, the exploits of the *RANCHERS* — whose near-daily exposure to hostile fire made them the war's most shot-at pilots — makes a darn good story in itself. Among the various characters who appear in this book — bureaucrats, brass hats, RVN officials, and critics of the war — the air crews stand out clearly as the heroes. Cecil is especially effective in portraying the RANCHERS' colorful subculture, with its mixture of impudence and professionalism, looniness and great courage.

At another level, the book provides further evidence that the United States lost the war because much of its colossal military effort was irrelevant. Although Cecil insists that defoliation and crop destruction *were* effective, he does not (and perhaps cannot) muster a persuasive case.

Rather than winning him over, Cecil's argument is apt to leave the reader frustrated by the vision of so much courage wasted and so much treasure invested without reward. At its peak, RANCH HAND was dousing Indochina with some five *million* gallons of Agent ORANGE and Agent PURPLE each year. During the period 1967-1969, over a million-and-half acres were sprayed annually. The profligate use of resources was so great that the Air Force at times followed up defoliation operations with giant B52 raids, not to kill any enemy but simply in hopes of starting fires. (They failed.) In the end, this vast effort had no impact on the war's outcome.

This is a book *worth reading.* Whether many will take the time to do so is another question. Can the public's weird nostalgia for Vietnam sustain a revisionist view of chemical warfare during that conflict? I doubt it. RANCH HAND isn't Rambo. Despite this book's many fine qualities, the standard view is likely to remain that expressed by one of my young soldiers: "Ah, Agent ORANGE — Too bad they didn't know it was cancerous before they started dropping it on people."

A. J. BACEVICH
LTC, Armor
2/3 ACR

MOSCOW, 1941: The Frozen Offensive, by Janusz Piekalkiewicz. Presidio Press, CA. 280 pages, $20.00.

Moscow, 1941 is literal proof of the old adage that you cannot tell a book by its cover: The cover is slick; in fact the entire physical appearance (including many excellent photographs) is impressive. It is the text that disappoints.

Polish author Janusz Piekalkiewicz attempts a chronological explication of the 1941 battle that halted German forces just short of Moscow. Unfortunately, the account is garbled by a lack of coherent organization and focus. Originally published in German, *Moscow, 1941* is further disheveled through indifferent translation and editing.

Except for the opening chapter (which includes an odd, quote-in-full of the German pre-Barbarossa terrain study, left adrift by Piekalkiewicz without any commentary whatsoever), each chapter unfolds in two parts: a day-by-day chronology and an "overview." Though interesting, the anecdotal items composing the chronologies too frequently have no connection either to major campaign events or to each other. The overviews lack analytical insight, and routinely skip over key events or issues. For example, Piekalkiewicz fails to explore in depth the disagreements over strategy within the German High Command, and neglects any meaningful analysis of Soviet strategy altogether other than occasional misleading references to the 1812 campaign against Napoleon. He also shows little understanding of the profound politico-military implications of Hitler's purge of senior commanders in December 1941, calling this instead "a simple personnel change."

Such analysis as does occur is often unsubstantiated or even patently incorrect, as when Piekalkiewicz asserts in his Foreward that Hitler erroneously believed a blitzkrieg-type campaign would not succeed in Russia and therefore "launched a war of attrition...instead of another blitz-

krieg." This remarkable contention is never supported (or even referred to again) in the entire book, and is contrary to the actual blitzkrieg concept clearly articulated by Hitler in the original Barbarossa campaign directives.

The translation and editing are careless. Moreover, the American editors have failed to smooth out some grammatical rough spots left over from the translation process, thereby leaving the text occasionally clotted with heavy-sounding Germanic passages.

Readers interested in good historical narrative and analysis of this subject are better off sticking to Barry Leach's *German Strategy Against Russia, 1939-1941;* Albert Seaton's *The Battle for Moscow, 1941-1942;* Alfred Turney's *Disaster at Moscow;* or even the iconoclastic *Operation Barbarossa* by Bryan Fugate.

TIMOTHY A. WRAY
Major, INF
Ft. Ord, CA

THE MEN OF COMPANY K, by Harold P. Leinbaugh and John D. Campbell. Bantam Books, NYC. $4.95 paperback. 334 pages.

If war, as Clausewitz says, is the ultimate expression of a nation's will, then the infantryman is the ultimate enforcer of that will. He is the man who advances and takes and holds the ground. He fights with the support of the other combat arms and the immense logistical trains, but he is the man who does it or doesn't do it. Artillery can level, armor can overpower, but the infantryman is the one who secures the battle, or loses it.

World War II was essentially an infantryman's war. All other arms supported him, most of the time. In all armies he fought under unbelievable hardships of weather, exposure, hunger, fright...most of all fright. By and large he conquered the latter and submitted to and bore the former.

The Men of Company K, 333d, Infantry, 84th Division (the Railsplitters), were such men. An amalgum of America; college graduates and illiterates, farmers, bankers, business and blue collar workers, they sought no glory, they merely wanted to survive. (140 Purple Hearts, 6 Silver Stars (two posthumously), 15 Bronze Stars, and 1 Belgian medal. 58 officers in division headquarters were awarded four times as many medals as the fighting men of Company K, and the enlisted men at headquarters received twice as many.)

Their story is biting, poignant, truthful. Raw, untried, and under doubtful higher leadership, they fought seasoned, battle-hardened Germans and, at least, held them when they did not push them back. This was company leadership at the captain, the lieutenant, the sergeant, and the corporal levels. The terrors, the heat-of-action errors that cost lives, the self-inflicted wounds, the bald-faced bravery, the bitter resignation of the physically and psychologically exhausted GI are here in black print.

At a time in their lives when black-frozen feet and legs put more men out of action than enemy bullets, when a breakfast of cold pancakes was luxury, when having a single, bogged-down, tank shoot up a pillbox was life itself, these men went on and on and did it. There has been a plethora of combat infantry books including *Company Commander, The Lost Soldier,* and even *All Quiet,* but *The Men of Company K* ranks equally.

Read it. There is nothing more to say.

ROBERT E. ROGGE
Radcliff, KY

112th Armor

Continued from back cover

Heavy Tank Battalion and assigned to the 49th Armored Division; concurrently organized from existing units and Federally recognized with Headquarters at Fort Worth. Redesignated 1 September 1950 as the 249th Tank Battalion.

ANNEX 4

Constituted 2 July 1946 and allotted to the Texas National Guard as the 239th Field Artillery Battalion. Organized and Federally recognized 3 June 1947 with Headquarters at Temple. Reorganized and redesignated 1 March 1949 as the 649th Antiaircraft Artillery Automatic Weapons Battalion and assigned to the 49th Armored Division. Redesignated 1 October 1954 as the 649th Antiaircraft Artillery Battalion.

Campaign Participation Credit

World War II
New Guinea
Bismarck Archipelago (with arrowhead)
Leyte
Luzon

Headquarters Company, 1st Battalion (Dallas); Headquarters Company, 3d Battalion (Brownwood); and Company B, 3d Battalion (Ballinger), each additionally entitled to:

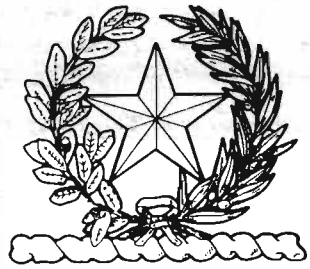
World War II-EAME
Naples-Foggia
Anzio
Rome-Arno
Southern France (with arrowhead)
Rhineland
Ardennes-Alsace
Central Europe

Company C, 1st Battalion (Lufkin), additionally entitled to:

World War II-AP
Ryukyus

Decorations

Philippine Presidential Unit Citation, Streamer embroidered 17 OCTOBER 1944 TO 4 JULY 1945 (112th Cavalry, Special, cited; DA GO 47, 1950)
Headquarters Company, 1st Battalion (Dallas), additionally entitled to:
French Croix de Guerre with Palm, World War II, Streamer embroidered VOSGES (636th Tank Destroyer Battalion cited; DA GO 43, 1950)
Headquarters Company, 3d Battalion (Brownwood), and Company B, 3d Battalion (Ballinger), each additionally entitled to:
Presidential Unit Citation (Army), Streamer embroidered SIEGFRIED LINE (142d Infantry cited; WD GO 37, 1946)
Presidential Unit Citation (Army), Streamer embroidered SELESTAT (1st Battalion, 142d Infantry, cited; WD GO 56, 1946)
French Croix de Guerre with Palm, World War II, Streamer embroidered VOSGES (142d Infantry cited: DA GO 43, 1950)



Symbolism

The shield is yellow for cavalry. The horse rampant issuing out of sinister base point is symbolic of the impatience of the regiment to be away on its business.

Distinctive Insignia

The distinctive insignia is the shield, crest, and motto of the coat of arms.

112th ARMOR

Rarin' To Go

Lineage and Honors

Constituted 3 December 1920 and allotted to the Texas National Guard as the 1st Cavalry. Organized during 1920-1921 from existing units in north central Texas; Headquarters Federally recognized 16 December 1920 at Fort Worth. Redesignated 20 July 1921 as the 112th Cavalry. Inducted into Federal service 18 November 1940 at home stations. Reorganized and redesignated 1 October 1944 as the 112th Cavalry, Special. Inactivated 17 January 1946 in Japan.

Regiment broken up 2 July 1946 and its elements reorganized and redesignated as follows: Headquarters and Headquarters Troop as Headquarters and Headquarters Troop, 56th Cavalry Group, Mechanized (Headquarters Troop hereafter separate lineage); 1st Squadron as the 112th Mechanized Cavalry Reconnaissance Squadron; 2d Squadron as the 145th Tank Battalion and assigned to the 49th Armored Division.

After 2 July 1946, the above units underwent changes as follows:

Headquarters, 56th Cavalry Group, Mechanized, reorganized and Federally recognized 23 May 1947 at San Antonio as Headquarters, 56th Cavalry Group. Reorganized and redesignated 15 September 1949 as Headquarters, 112th Armored Cavalry.

112th Mechanized Cavlary Reconnaissance Squadron reorganized and Federally recognized 31 November 1947 with Headquarters at San Benito. Redesignated 12 September 1949 as the 1st Battalion, 112th Armored Cavalry.

145th Tank Battalion reorganized and Federally recognized 1 November 1946 with Headquarters at Fort Worth. Reorganized and redesignated 1 March 1949 as the 145th Medium Tank Battalion. Redesignated 1 October 1952 as the 155th Medium Tank Battalion. Redesignated 1 December 1952 as the 155th Tank Battalion.

1st Battalion, 112th Armored Cavalry; 155th Tank Battalion; 156th Tank Battalion (see ANNEXES 1 and 2); 249th Tank Battalion (see ANNEX 3); 649th Antiaircraft Artillery Battalion (see ANNEX 4); and 3d Battalion, 112th Armored Cavalry (organized and Federally recognized 9 February 1951 with Headquarters at San Juan), consolidated 16 March 1959 with Headquarters, 112th Armored Cavalry; consolidated unit reorganized and redesignated as the 112th Armor, a parent regiment under the Combat Arms Regimental System, to consist of the 1st, 2d, 3d and 4th Medium Tank Battalions and the 5th Reconnaissance Squadron, elements of the 49th Armored Division. 1st, 2d, 3d, and 4th Medium Tank Battalions and the 5th Reconnaissance Squadron ordered into active Federal service 15 October 1961 at home stations; released 9 August 1962 from active Federal service and reverted to state control. Reorganized 1 March 1963 to consist of the 1st, 2d, 3d, 4th, and 5th Battalions, elements of the 49th Armored Division, and the 6th and 7th Battalions, elements of the 49th Armored Division, and the 6th and 7th Battalions, elements of the 36th Infantry Division. Reorganized 15 February 1968 to consist of the 1st Battalion, an element of the 72d Infantry Brigade, and the 2d and 3d Battalions, nondivisional units.

ANNEX 1

Organized 15 October 1917 from existing units of the Texas National Guard in Federal service as the 2d Battalion, 144th Infantry, an element of the 36th Division. Demobilized 21 June 1919 at Camp Bowie, Texas. Reorganized during 1921-1922 as an element of the 36th Division with Headquarters Federally recognized 19 May 1922 at Dallas. Inducted into Federal service 25 November 1940 at home stations. (144th Infantry relieved 1 February 1942 from assignment to the 36th Division.) Inactivated 20 September 1945 at Camp Rucker, Alabama.

Consolidated 2 July 1946 with Company B, 636th Tank Destroyer Battalion (see ANNEX 2); consolidated unit redesignated as the 146th Tank Battalion and assigned to the 49th Armored Division. Organized and Federally recognized 12 February 1947 with Headquarters at Dallas. Reorganized and redesignated 1 March 1949 as the 146th Medium Tank Battalion. Redesignated 1 October 1952 as the 156th Medium Tank Battalion. Redesignated 1 December 1952 as the 156th Tank Battalion.

ANNEX 2

Constituted 3 December 1941 in the Army of the United States as Company B, 636th Tank Destroyer Battalion. Organized 15 December 1941 at Camp Bowie, Texas, from antiaircraft and antitank elements of the 132d Field Artillery. (636th Tank Destroyer Battalion allotted 17 February 1942 to the Texas National Guard.) Inactivated 4 December 1945 at Camp Myles Standish, Massachusetts.

ANNEX 3

Constituted 3 December 1941 in the Army of the United States as Company A, 636th Tank Destroyer Battalion. Organized 15 December 1941 at Camp Bowie, Texas, from antiaircraft and antitank elements of the 131st Field Artillery. (636th Tank Destroyer Battalion allotted 17 February 1942 to the Texas National Guard.) Inactivated 4 December 1945 at Camp Myles Standish, Massachusetts. Expanded and redesignated 1 March 1949 as the 249th

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