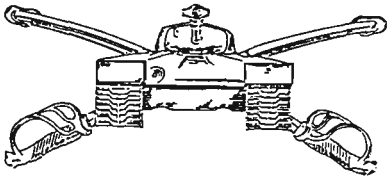
ARMOR

The Magazine of Mobile Warfare

September-October 1986

SCHWERPUNKT



The necessity to relearn the combat lessons of previous wars has always been costly for the U.S. Army. The relearning experience has cost America the lives of many of its soldiers, sailors, airmen, and marines. Relearning those lessons has nearly always been the result of ignorance — our failure to study past battles or to keep in mind the lessons for which brave soldiers paid with their lives. One of the purposes of *ARMOR Magazine* is to provide a forum for the discussion of those lessons.

Our cover story in this issue of *ARMOR* has a simple, and deceptive, title: "Attacking Dismounted Infantry with Armored Cavalry." Written by three of Armor's superb combat veterans, **BG John "Doc" Bahnsen, COL Arthur West III, and LTC(P) Doug Starr,** this story is about a vicious fight between the 1st Squadron, 11th Armored Cavalry Regiment, and the 209th North Vietnamese Regiment in the Michelin rubber plantation at Loc Ninh. The fight was not without cost to the Blackhorse, but the battle was even more costly for the NVA. I commend this feature to you both for the excellent writing and the lessons learned that day by the troopers and officers of that fighting squadron.

In peacetime, we learn our lessons on the training field so that we will be better prepared for combat on the battlefield. Perhaps no other group of men learns those lessons better than do the members of the Observer-Controller Group at the National Training Center at Ft. Irwin. In "Lessons Learned at the National Training Center: An Observer-Controller's Perspective," **MAJ Beaufort Hallman, Jr.,** provides us with valuable training information. Whether you are a veteran of many trips to the NTC, or you are gettng ready to go for the first time, you will learn much from this feature.

An identified weakness of our forces at the NTC continues to be reconnaissance and counter-reconnaissance operations. "Dear Old Bill" by **1LT Michael Todd** and "Find the Second Echelon" by **LTC William Howard** are excellent articles on training reconnaissance skills and practicing them in the field. I also recommend the "What Would You Do?" feature of this issue. Written by **CPT John Ballantine IV,** this first part of a three-part series details the planning and conduct of a "Delay in Sector" by a regimental armored cavalry troop.

Richard M. Ogorkiewicz has been a noted author and expert on all types of armor for many years. In this issue of *ARMOR* he writes of "Novel Tank Guns." It is a clear and detailed article on emerging weapons technology that I know you will find informative and interesting.

This is the "Year of Values" for the U.S. Army. In a succinct and thoughtful article titled "Enduring Values for the Armor Leader," **CPT Porcher Taylor III** offers us insight into our Army's theme for 1986 as it applies to our profession as tankers and armored cavalrymen. I commend it to you.

The tank appeared on the battlefields of WW I as a way to regain mobility over ground that had become filled with obstacles. Since that day, we, and our enemies, have constantly attempted to devise better obstacles to defeat the mobility that the tank brought to the battlefield. **CPT Stephen J. Ressler,** in "Tank Bumps: A New Concept in Obstacle Employment," provides us with an innovative way to make obstacle-crossing extremely costly for our enemies.

Studying and remembering the lessons that our Army has learned on the battlefield in combat and on the training field in peace remains one of our most important tasks as professionals. The alternative — relearning those lessons in the first battle of the next war — is simply not acceptable; the cost is far too high. We hope that this issue of *ARMOR* helps to ensure that none of us have to pay the price of ignorance on the battlefield, for that price will be the blood of our soldiers.

— GPR

ARMOR The Magazine of Mobile Warfare

September-October 1986 Vol XCV No. 5

FEATURES

DEPARTMENTS

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LETTERS

Missiles? Not Yet!

Dear Sir,

From what I read and hear, it seems that some civilian defense officials and some Army and Marine Corps officers have an excessive fascination/love affair with missiles, to the detriment of gun-armed fighting vehicles. I believe our missiles are great; however, we should keep them in the proper perspective. As a multiple veteran of combat, I know that various systems and weapons do not always perform the way our reasearch and development data indicate they should.

At the point our technology is today, missiles are too expensive, too large, and too heavy. A fighting vehicle, surface or airborne, can carry only a limited number. Resupply is a problem since they take up so much cubic space and weigh so much that only a few can be transported forward at any one time. In spite of all the hyperbole about their ability to knock out targets at longer ranges than guns, based on my experience, this is normally unrealistic. The world is not flat nor are deserts an open plain. We are going to fight in urban areas, mountains, woods, and jungles. Very seldom will we be able to take advantage of the missiles' long range from ground mounts or vehicles; helicopters, yes, very likely. In most cases, surface vehicles — due to terrain — will have few opportunities to employ missiles at their maximum range. I further believe that most combat will take place within what is now standard gun range.

Until our technology reaches the point where we can produce missiles with all of today's capabilities — yet with the weight, size, and cost of a round of 75-mm ammunition — we are going to need our current gun systems for the foreseeable future. Our present generation of missiles have many other disadvantages besides weight and size. Compared to a gun system, they are both difficult and slow to reload. Considering their expense and the limited number that can be carried by a fighting vehicle, it is unlikely they could be used to support infantry. Personnel in small defensive positions, perhaps with ATGM, will require heavy infantry casualties to clear, when one round from a tank gun or fire from an IFV 25-mm would have accomplished the same thing.

I believe that we have drawn too many wrong conclusions about the results of weapons systems in the Israeli/Egyptian conflicts. Neither the Israelis nor the Egyptians fight the way we do. We should also remember that in their last war, the Israelis were overconfident and contemptuous of the Egyptians; for this, they paid a price. There is a lesson in this for us in view of the fact that we have members of Congress, civilian analysts, and even a few military men who underestimate Soviet capabilities and equipment. Such an attitude could cost us dearly in any future conflict with them.

For the above reasons, I believe that those individuals calling for us to rearm with missiles only are very foolish. If and when we can solve the problem of missile cost, size, weight, and reloading speed through technology, then and only then can I accept their call for all-missile-armed weapons platforms; until then, we are going to have a continual need for gun-armed platforms.

MARTIN L. STEITZ
Sneads Ferry, NC

A Correction

Dear Sir,

A dedicated, and sharp-eyed reader, CSM William S. Beasley (Ret.), caught a couple of errors in "The Father of the Armored Force" that appeared on the inside back cover of the May-June 1986 issue of *ARMOR* Magazine.

Error #1: The article stated that the 7th Cavalry Brigade (Mechanized) was formed from the 1st and 7th Cavalry Regiments. It should have been the 1st and 13th Cavalry Regiments.

Error #2: General Chaffee was promoted to the temporary rank of Major General in September 1940. In the article, it appears that he was awarded a "deathbed" promotion to two-star rank. Actually, General Chaffee's two-star rank was made permanent just prior to his death on 22 August 1941. The "deathbed" promotion information was extracted from a *New York Sun* obituary that said: "...a fact recognized as he lay on his deathbed by his promotion to Major-General..."

— G. Patrick Ritter, Editor

Praise and Comment

Dear Sir,

Regarding the May-June 1986 issue: fantastically great! The best in my long memory, particularly "Taking Charge." ("How Would You Do It," pp. 20-21, M-J *ARMOR*)

If I might, let me add that if the new officer is concerned about the shine on his boots and the "QM" odor still lingers on his uniform, this young officer might expend some time in evaluating the "personnel" situation. Coming down too strongly could cause many problems, without consideration for the cause.

As any cavalry soldier knows, first the HORSE, second the WEAPONS, then and only then the TROOPER. A medicinal portion of alcohol might help that platoon sergeant do both the job of platoon leader and platoon sergeant, even though not authorized by the Army.

GY SGT E. J. HERTERICH
USMC (Ret.)
San Marcos, CA

On TOCs and Robots

Dear Sir,

I just received the May-June issue, which was an excellent issue, from the history of the 2d Dragoons to military applications of robotics.

I would like to comment on LTC Wallace's excellent article on selecting a site for a tactical operations center ("Tactical Operations Center Site Selection"). One aspect that no one seems to consider is that when one is forced to put the TOC in a less desirable location, the field expedient of remoting the radio transmitters would go a long way toward confusing the enemy as to the true location of the TOC.

The article by Captains Lynch and Nugent was very interesting, ("Military Applications of Robotics: The USAARMS Approach") but it contained a few errors. (According to the authors) "...The next obvious question is whether the state of the art in robotic technology supports the proposed military use of robotics — the answer is no."

I disagree, since we have had for quite some time the technology to field robotic devices for military use; however, when we add in all the gold-plated bells and whistles, perhaps not. The technology for gold-plating bells and whistles may not be perfected but for most military applications, we could have fielded functional robotic vehicles several years ago.

There is no reason to take a human out of the control loop for weapon systems. To do so invites disaster. With humans manning the SGT York DIVAD, the system ran amok and almost destroyed the observers of the test. I suspect combat would be worse.

Antitank robots could have been fielded in 1982, if not sooner. Explosive ordnance demolition robots are already in use by various police departments. While at Battelle Labs in 1980-81, I suggested that we work on developing robotics, but could find no one who was interested. It appears that DARPA has finally taken our advice, but it is a long way from DARPA to the soldier in the field.

WILLIAM A. HOWARD
LTC, USAR
Largo, FL

"A New Era"

Dear Sir,

Congratulations and thanks to Captains Lynch and Nugent on their article "Military Applications of Robotics, The USAARMS Approach" (May-June *ARMOR*). We are on the threshold of a new area of weapons technology which can, as the authors point out, be of significant benefit to the soldier in many ways.

A key issue that must be resolved is

finding a sensible application of robotic systems that best meets the soldier's need. The clear recognition of that issue and the author's suggestions for close working relations between the user and industry is a high point of their article.

An iterative process may be the best approach through which — as the Army learns more about the capabilities that technology can provide — they can better think through applications. And as industry better understands the user's needs, it can direct its research in focused directions. The *ARMOR* Magazine article was an excellent first step in that process.

J. J. MacROSTIE
Vice President, Product Development
FMC Corporation
Santa Clara, CA

Mobile Mess Trucks

Dear Sir,

I have recently been assigned as the battalion support platoon leader. During our last annual training period, the inability of my mess section to displace quickly was a shortcoming.

An NCO from my former tank platoon was fortunate to be involved in Reforger '86 with the Wisconsin National Guard. This NCO told me about one of the armor battalions in Germany who had built their own mess trucks. This allowed the cooks to leave most of their equipment on the vehicles, thus making their displacement less time-consuming.

We in the 1st Bn, 94th Armor are interested in building our own mess trucks. Any information from you or your readers would be greatly appreciated.

ERIC D. KERSKA
2LT, AR, MN ARNG
Lacrescent, MN

An Author's Reply

Dear Sir,

In reference to "The Defense of the Vienna Bridgehead," in the January-February issue — Mr. Hodge is indeed correct when he states that Oberscharfuhrer Barkman survived the hit on his tank on the night of 12 April 1945... Barkman was wounded, but was able to make his way back across the Floridsdorf Bridge the following day.

Giesen did not realize that Barkman had been able to escape the inferno of his tank. Barkman later surrendered to the British, while Giesen surrendered to the Americans, who subsequently turned him over to the Russians. Giesen thus lost all contact with Barkman and assumed that he had died in Vienna. He only recently became aware of Barkman's existence after reading *Panzers in Normandy,* by Eric Lefevre, one of the books which Mr. Hodge cited in his letter. As Giesen states, "Some people just cannot be killed in war. Barkman was one such person, for he continually cheated death."

There is one other minor mistake in the article which I would like to take the opportunity to correct. Giesen's tank number was 227, not 1227. German tank numbers stood for the company-platoon-tank ID number and although some command vehicles had more than three numbers, Giesen's tank did not.

I thank Mr. Hodge for his interest in the article and his comments.

PETER R. MANSOOR
CPT, Armor
Radcliff, KY

Col Twiggs and the Dragoons

Dear Sir,

It was with considerable enjoyment that I read the article on the history of the 2nd Cavalry in your May-June 1986 issue. The career of Colonel David Twiggs, the regiment's founder and first commander, has always been a special interest of mine. I must, however, take issue with the statement of Major Thompson and SFC Morrison regarding who set the standards and forged the character of the regiment in its early years.

It is true that Colonel Twiggs was occasionally away from the 2nd during its tour in Florida in the Seminole War. For one, he was a personal protege of President Jackson and spent considerable time in Washington with other politicians of the Van Buren administration. Second, his young wife died in 1840 and he received "compassionate" leave to care for his two infant daughters. Absences aside, the real measure of his qualities as a leader can be found in contemporary accounts.

Colonel Theophilus Rodenbough, unofficial historian of the regiment, wrote in *From Everglades to Canyon with the Second Dragoons* (1875) that Twiggs personally led the 2nd on its famous march from St. Louis to Jacksonville, Florida in 1837. Twiggs's march discipline was demonstrated by "the fresh and healthy appearance" of the officers and men and the "high state of order and attention" of the horses. Indeed, Rodenbough wrote that Twiggs "moulded the new organization with an iron hand...establishing an *esprit de corps* admirable as it was lasting."

In 1841, Twiggs took the 2nd to Louisiana, where they remained under his command until moving to the Rio Grande before the outbreak of the Mexican War. During his tenure at Fort Jesup, regimental headquarters, Twiggs continued to stress his own special brand of administration. His principal executive officer for drill and tactics was Captain William J. Hardee, not Lieutenant Colonel Harney (according to Rodenbough). So well turned out was the regiment at this time that the Inspector General of the Army wrote in his annual report, "I have never before seen so fine a command, and I question whether a better in every respect is to be found anywhere. Discipline the most perfect prevails throughout..." (from *Army Life on the Western Frontier, Selections from the Official Reports Made Between 1826 and 1845 by Colonel George Croghan* (1958).

Twiggs commanded the regiment for ten years, until he was promoted to brigadier general following the battles of Palo Alto and Resaca de la Palma. Harney took over after that, but the tone for the regiment had already been set. In his military dotage, Twiggs, out of personal pique and sectional loyalty, committed an act of treason which overshadowed all his former contributions. (See my article on Twiggs in *Military Affairs,* April 1984.) That unfortunate episode has been a blot on his record for 125 years. His accomplishments as disciplinarian and military administrator deserve to be remembered.

RUSSELL K. BROWN
MAJ, USA (Ret.)
Fort Gordon, GA

Encyclopedia Seeks Authors

Dear Sir,

I find the articles in *ARMOR* to be excellent and interesting. I am editing *The International Military Encyclopedia* and there are many armor entries for which I will need authors.

The encyclopedia is planned to be the most definitive source for information on all aspects of military affairs ever undertaken. It will take at least 70 volumes over the next 15 years or so to complete. We particularly want to emphasize the interrelationship of military with economic, social, cultural, and political affairs, as well as professional military subjects.

There are already over 500 volunteers at work on entries for the first volumes, but we need many more. (I have over 2000 entry topics selected under the letter "A" alone.) The most immediate need is help in contacting a wider circle of potential contributors. Please publicize the project to others. All entries will be signed and there will be a list of contributors at the front of each volume.

The concept is for authors to write on topics they already know quite well and for which they do not need to do much additional research. The first volume, which is now at the printer, covers topics beginning with the letter "A" to "Ad". We hope to complete the four or five volumes for the letter "A" by the end of 1986. I would be happy to send you a draft topic list by way of illustration, along with further information on format and administrative matters.

JOHN SLOAN
The International Military Encyclopedia
P.O. Box 1109
Springfield, VA 22151

Lieutenant General Alvan C. Gillem, Jr.

A third generation "Army brat" became the fourth commanding general of the Armored Force on 13 July, 1943. He began as a buck private and retired with three stars.

Alvan C. Gillem, Jr., son of a cavalry colonel and grandson of a Civil War cavalry general, enlisted in the 17th Infantry at Atlanta, GA, in January 1910, because there were no West Point appointments available at the time. A little more than a year later he was commissioned a second lieutenant in the infantry.

Immediately following WW I, General Gillem served with the American Expeditionary Force in Siberia and later organized and commanded the 23d Machine Gun battalion, 8th Infantry Division. He rose to the position of division machine gun officer.

His career in the between-wars decades consisted of an assignment as professor of military science and tactics at the University of Maryland, service in the Philippines and Hawaii, and duty on the Mexican Border where he once soldiered with General Pershing.

He instructed at the Infantry School at Fort Benning, graduated from the Army War College, and was assigned to general staff duties at Third Corps Area Headquarters from 1926 to 1930.

In 1939, he was named commanding officer of the 66th Infantry (Light Tanks), which marked his first connection with tanks.

In 1940, with the creation of the Armored Force, the 66th Infantry became the 66th Armored Regiment (Light), and on 1 February 1941, Colonel Gillem was promoted to brigadier general and named commanding general of the 2d Armored Brigade, 2d Armored Division.

His next move was to Camp Polk, LA, where he organized and commanded the 3d Armored Division. He was then named commanding general, Desert Training Center in California, the forerunner of today's NTC.

Early in WW II, General Gillem commanded II Armored Corps that was charged with the defense of the West Coast.

One of his first actions as chief of the Armored Force (May-November 1943) was to accentuate the artillery side of armor's triumvirate (cavalry, infantry, artillery). He was a pioneer in tank gunnery and armament and espoused the doctrine of coordination and teamwork, vital in the success of a combined-arms force.

In December 1943, he took command of XIII Corps and went overseas with that unit in July 1944 to lead its offensives in France, Belgium, Holland, and Germany. At war's end, XIII Corps was the closest U.S. fighting unit to Berlin. On 3 May 1945, he was promoted to lieutenant general and left XIII Corps to assume command of VII Corps that was then preparing for the invasion of Japan. He was the only general officer in WW II to command three distinct corps.

After Japan's surrender, he returned to Washington, D.C., where he headed the Gillem Board for Manpower Utilization in the Armed Forces. General George G. Marshall, then Chief of Staff of the Army, took General Gillem with him to China as deputy on a special presidential mission attempting to end China's civil strife. From October 1946 to April 1947, he served as U.S. Commissioner of the Executive Headquarters, Peiping, China. On his return to the U.S., he assumed command of the Third Army on 6 June 1947.

Lieutenant General Gillem retired from active duty and command of Third Army on 1 September 1950.

Combined Arms

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

On 10 July 1940, the United States War Department directed the establishment of the Armored Force and the I Armored Corps under the command of Brigadier General Adna Chaffee. From that force and that great leader emanated the basic foundation of all our tactics: Combined Arms. In those days, we had armored infantry, armored field artillery, armored engineers, et al. Hopefully the lessons of the past do not have to be relearned.

General Chaffee once described the armored division as "a balanced fighting team of combat arms and services, all of equal importance and of equal prestige." He saw — and history has shown — that the modern battlefield permits no branch to "go it alone." Whether pushing through the Siegfried Line, fighting in the mountains of Korea, or cutting through the Vietnamese jungles, no single arm or service has been successful by itself. The Armored Force of the 1940s learned the lessons that the desert battlefields of the Middle East and the desert training fields of the Mohave have illustrated time and again: the power of a team, a task force, or a brigade, organized as a temporary grouping of mechanized infantry, tanks, field and air defense artillery, ground and air cavalry, attack helicopters, combat engineers, electronic warfare and intelligence units, maintenance, supply, and medical units is a force to be reckoned with. None of these elements can survive, let alone win, on the modern battlefield by themselves: they must train and fight as a combined arms force. No single element is more important than any other element; they are of "equal prestige and importance."

Recognizing the concept of combined arms is just the first step, but it is an important one. The next step is putting that concept to practice in our thinking and our training. There will be many times when the tank platoon, tank section, or tank crew must train in isolation. However, even when these pure elements do so, we must realize that they are backed up by equally important maintenance and supply units. When a company trains, it should train as a team. When a battalion trains, it should train as a task force. Going to the field — or the classroom — as an armor-pure organization simply does not "meet the mail." When we fight, we fight together with infantry, field artillery, and the rest of the team. It is, therefore, essential that we train as we propose to fight, as a combined arms team.

A company or troop commander who fails to include an infantry platoon, a FIST, and his maintenance team in each of his company training events is not preparing to fight the next war or to defeat the OPFOR at the NTC (or Hohenfels). The same holds true for the battalion commander and the brigade commander. Training with just your "own people" is easier, but it is not preparing your soldiers to fight and win and survive.

Our modern term for the resulting effect of combined arms is "synergism." It means that the combined effect of the parts put together is greater than the effect of each element working separately but added up. I'll tell you that synergism is simply the result of teamwork, and teamwork is what combined arms is all about. We all have particular pride in our own separate branches and units, but individual pride by any branch, arm, or service will not survive the lethal weapons, modern tactics, and offensive nature of the potential threat. Teamwork — combined arms — will not just help us survive; it will permit us to win.

We owe it to our soldiers to ensure that the odds are on our side. This we can accomplish through realistic combined arms training. To do any less would be a disservice to our greatest strength, the American soldier.

Nearly 50 years ago our Army made a decision to develop a combined arms force: The Armored Force. We in armor are the result of that decision. Let's never forget that, or the teamwork that is necessary to train to fight and win.

Armor Safety is NCO Business

by Sergeant Major of the Army Glen E. Morrell

Safety is NCO business, a very important business if we expect to train and execute the plans of our leaders. They have entrusted us with the responsibility of instilling spirit, loyalty, and trust in our fellow soldiers. To make these ideas work, safety must become a reality in our day-to-day operations.

As NCOs we must push safety forward, instilling it into each soldier so that each day — whether in the motor pool or the field — safety is part of every action, no matter how small.

Armor Accidents: No New Causes

Year after year, vehicle operations are the single largest source of operational accidents in armor units. Each year, we lose soldiers and equipment because safety discipline breaks down. Let me give you some examples.

- An M60A3 was crossing railroad tracks when the improperly secured auxiliary antenna came loose and hit overhead power lines. The tank was destroyed by fire; the accident cost $1,183,204.
- An M88 carrying eight soldiers was towing an M60A3 tank. Going down a steep grade too fast, the driver lost control. One soldier was killed and five were injured when the vehicle overturned.

In these cases, and many others, good training, good procedures, and good supervision by good NCOs could have prevented costly accidents. But all the training and all the procedures in the world won't prevent a single accident unless they are practiced. And they won't be practiced unless you insist on it.

NCOs Can Make the Difference

It's time we NCOs started being active members of the safety team — stop being observers, and start being players. We must impress on our fellow NCOs and enlisted soldiers that safety is a full-time job. We must be aware that such things as boredom, lack of training, poor supervision, and failure to follow procedures are all factors that can and do lead to accidents. NCOs can and must make a difference. We must do our jobs right and make those who work for us do their jobs right, too.

Yes, safety is NCO business, a special business of keeping our soldiers alive, well, and able to fight. We see practically everything that goes on, so we are in the best position to improve soldier performance and safety. Only through positive action can we expect safety to work for all of us. Too many times we let safety become a late-Friday-afternoon, 1-hour class that takes 10 minutes to present. This type of negative thinking and action must stop if we expect safety to become a real and active part of training.

Set the Example

Armor NCOs operate in an environment that demands well-trained, disciplined soldiers. You have a special responsibility, particularly to new, inexperienced, soldiers who look up to and identify with their NCO supervisors. Our soldiers watch us and copy the way we do business. If we don't follow the rules, our soldiers aren't likely to, either. If they see a lazy NCO, or an NCO who does a halfway job, then whose fault is it when that kind of behavior causes an accident? The NCO alone stands responsible.

Safety is not a slipshod, haphazard, turn of events. It is hard work, dedication, and a sincere belief that safety can and does make a difference. And as NCOs, we can make it happen.

I ask each of you to make safety your personal commitment, just as I have. Insist on absolute compliance with safety rules and work procedures. And make it a point to explain the reasons for the rules, because people are more likely to obey rules they understand.

Remember, safety is our obligation to our soldiers; safety is mission protection; safety is NCO business.

This month, CSM John M. Stephens turned his column over to guest columnist SMA Glen E. Morrell as part of the special safety campaign being conducted by SMA Morrell with the support of the Chief of Staff of the Army.

RECOGNITION QUIZ

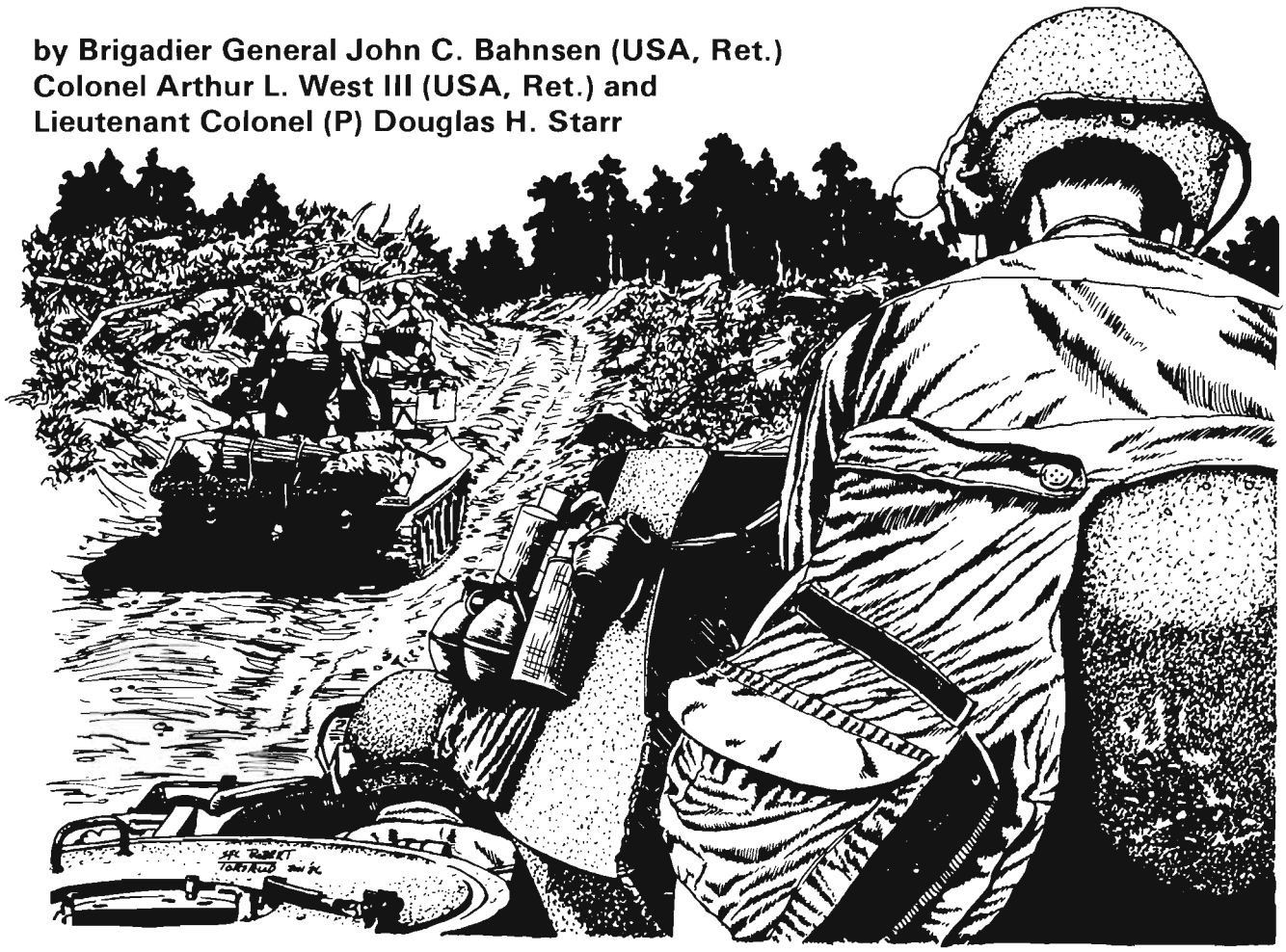
This Recognition Quiz is designed to enable the reader to test his ability to identify armored vehicles, aircraft, and other equipment of armed forces throughout the world. *ARMOR* will only be able to sustain this feature through the help of our readers who can provide us with good photographs of vehicles 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.

See Answers on Page 42

VIETNAM: 6 September, 1969

Attacking Dismounted Infantry with Armored Cavalry

by Brigadier General John C. Bahnsen (USA, Ret.)
Colonel Arthur L. West III (USA, Ret.) and
Lieutenant Colonel (P) Douglas H. Starr



An attack on dismounted infantry in the open by any armored force is, at worst, a meat-grinding operation. This article is based on the reflections of three commanders concerning just such an action in the Republic of Vietnam. It concerns the combat actions of the 1st Squadron, 11th Armored Cavalry Regiment, on 6 September 1969, about three and a half kilometers west of the village of Loc Ninh, a small district capital in the rubber plantation area to the north of the provincial capital of An Loc. The lessons learned by the commanders in this action, in many instances, are not new, but bear repeating.

The terrain in the area of the fight was a fully developed rubber plantation with unpaved roads throughout. The enemy situation was, as normal, spotty with no specific enemy locations known. From previous actions and captured documents, the 209th North Vietnamese Army (NVA) Regiment was identified in the general area of Loc Ninh. During the past two months, the squadron had had continuous contacts in the area.

The squadron was task organized for this day's operation as follows:

A Troop (-) (CPT Palmer)	B Troop (CPT Starr)
Detached to BUDOP Special Forces Detachment	
Team C (CPT West)	Co D (CPT Kramer)
C Troop	
2 Companies CIDG	
Team PAPA	SQDN CON
(CPT Poindexter)	HHT (-)
HHT ACAV section	How Btry
Surveillance section	Avn Sec
Flamethrower ("Zippo") section	
1st Plt, 919th Armd Eng Co	
M551 Plt (Prov), A Troop	

Here, in their own words, three of the commanders tell the story of the Loc Ninh Action of 6 September 1969.

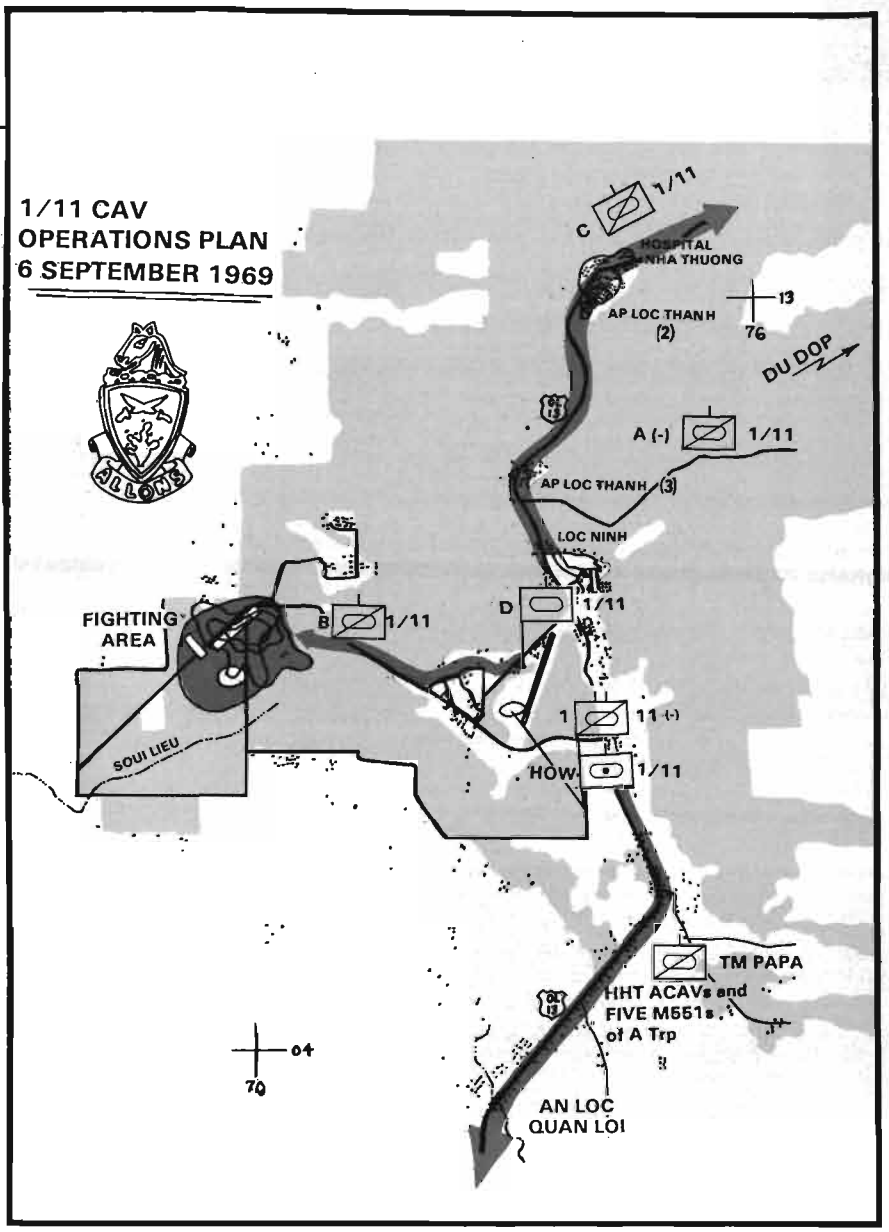
Setting the Scene

MAJ Bahnsen: B Troop and Team C were given an area reconnaissance mission west and northeast of Loc Ninh respectively (Sketch 1). Company D was given a maintenance day to repair its 11 downed M48 tanks, but was told to be prepared for possible reinforcement of B Troop or Team C with all assets available. Team PAPA was given a convoy escort mission to An Loc, 25 km to the south. One UH-1 and one OH-6 were on standby at the squadron CP. At approximately 0938 hours, B Troop (CPT Douglas Starr) reported contact with an enemy force estimated to be at least

company size. I immediately got airborne and flew to the area. Within minutes, howitzer battery (CPT Ed Plymale) placed artillery fire to the west of B Troop. I adjusted the fire to block the enemy's withdrawal. A pink team (one OH-6 and one AH-1G) from the 11th Cavalry's Air Cavalry Troop was placed under my operational control at this time, and at least one team remained on station throughout the day.

CPT Starr: Having received the reconnaissance mission for the next day from MAJ Bahnsen, I left the squadron CP for my ACAV and the two escort tracks I had with me to ooze the short distance back to my troop CP on the mud-inundated roads. As I ate supper, I thought of how best to perform the reconnaissance, in view of recent severe rains causing extremely muddy conditions in the assigned area.

At my platoon leaders' briefing that evening I outlined the next day's mission, which included a troop-size reconnaissance in force, using pinwheel movements, in the southern half of the rubber (plantation). I put special emphasis on thorough reconnaissance and more-than-usual caution in any type of possible ambush site. The pinwheel movements were designed to best cover the rubber and yet avoid crossing most of the creeks and depressions. The special emphasis was precipitated by a series of reports my troop CP had been receiving since just before supper indicating large troop movements into our sector during the last six to twelve hours. It was to prove to be most worthwhile special emphasis....



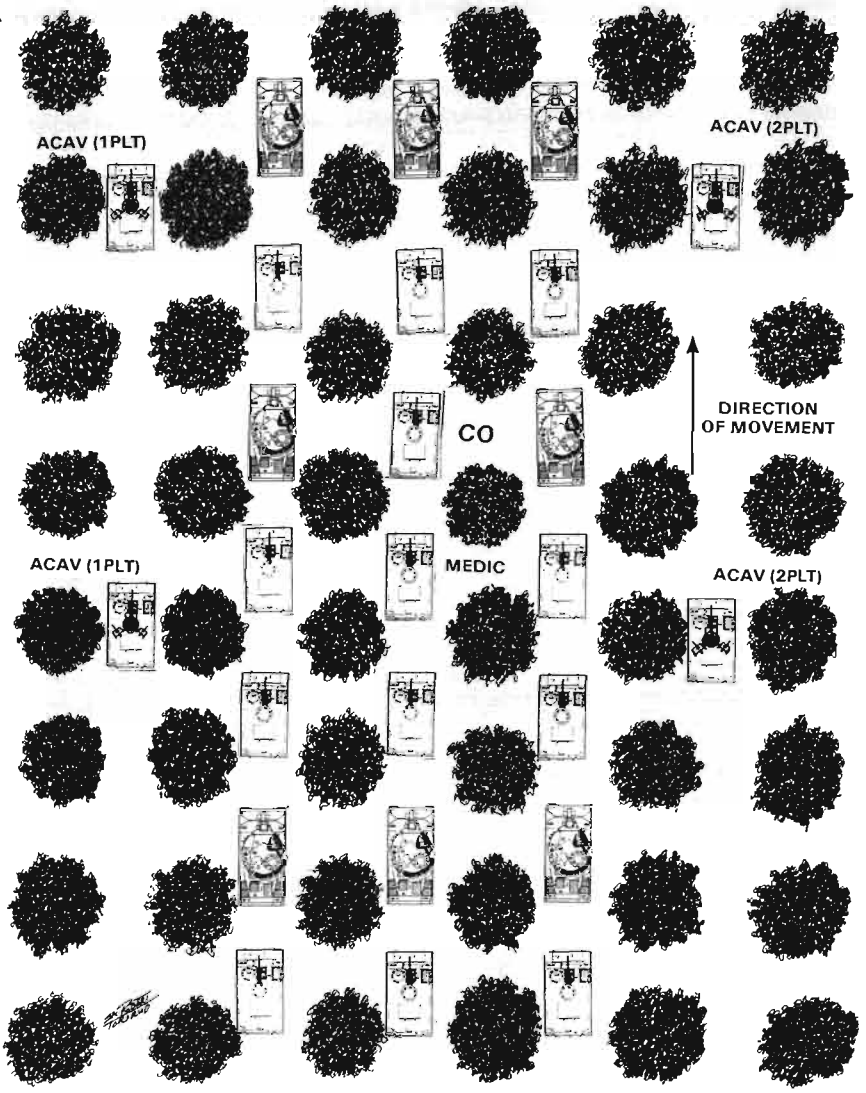
Sketch 1. Disposition of the 1/11 Cav on 6 September 1969. B Troop first reported contact while on a reconnaissance mission west of Loc Ninh, in a rubber tree plantation.

The sun shone warmly as the troop splashed through the small village of Loc Ninh and entered the rubber at approximately 0845. It had been a quiet night with even the enemy reports of the previous day tapering off and finally ending about midnight. The village children and the rubber workers were out in force and waving happily. All was peaceful, and the war seemed a long way off....

Approximately 300 meters into the rubber I gave the order to veer left off the road and assume what I called our "Rubber Formation" — a five-vehicle-front, rectangular-shaped formation designed for terrain that allowed reasonably good vision (Sketch 2). The platoons moved into position. I noted to my satisfaction that, despite the rare sunny morning and the friendly greetings in the village, the troops were alert. This alertness was within minutes of saving the troop's life....

Contact at Hill 203

As we moved through the rubber, we paralleled a deep ravine to our left and bore left with it as it turned from northwest to southwest toward the areas of the rubber seldom worked by the Vietnamese rubber workers. We were approaching Hill 203, paralleling the road on our right, when my First Platoon Leader, LT Steven Vince, informed me his left flank security had detected possible movement to our left front (Sketch 3). We had been in this rubber often before, and, while unusual, workers in this area were a possibility. I gave the order to bear left, increase speed, and hold fire. After moving about 50 meters my Second Platoon Leader, LT Harry Hardin, in a voice that was calm but unmistakably concerned, reported *his* flank security had definite movement on the high ground now to our right flank. I immediately gave the order to turn right and



Sketch 2. The unit's "rubber formation" as it moved through the plantation area prior to first contact.

ordered LT Vince to keep a sharp watch for the suspected movement he had originally reported. As we approached Hill 203 from the SE, we engaged three brown-clad individuals running at a crouch across our front on the high ground. As I gave the order to come on line and move up the hill, the thunderous din of enemy fire from the entire mass of high ground to our front quickly told me that we were engaged with an enemy force of at least company size and, judging from the number of automatic weapons, probably of battalion size or more (Sketch 3). Quickly reporting to MAJ Bahnsen, I fully deployed the troop and began moving as quickly as possible toward the high ground (Sketch 3). I was hindered slightly by the muddy ground and by the fact that two of my three platoon leaders had their antennae shot off and were attempting to correct that while continuing to move and direct their platoons. MAJ Bahnsen was enroute and the howitzer battery had begun blocking fires on the far side of Hill 203.

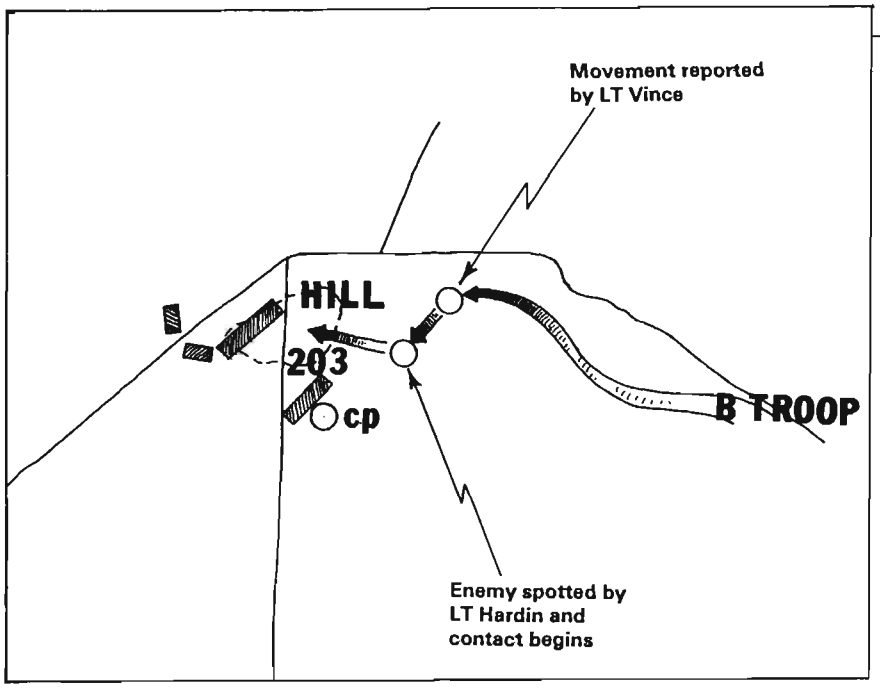
About one-third of the way up the hill, a freakish RPG round entered the coax aperture of an M551 Sheridan at the center of our formation, causing a flash fire in the turret. Several other casualties had occurred on other tracks and medics were kept busy consolidating the wounded at the medic track in the center of our formation, which at this point consisted of two platoons on line (1st and 2d) with LT Leroy deWitt's 3d platoon providing rear and flank security. Informing MAJ Bahnsen of the serious nature of my casualties and my estimations of the size of the enemy force (approximately battalion size), I was instructed to evacuate my casualties to an LZ where a medevac could get them out. I also monitored MAJ Bahnsen's orders to C Troop and D Company to join the fracas.

MAJ Bahnsen: Upon report of the battalion-size contact, I immediately ordered Company D and C Troop (previously alerted) to move to the firefight. MAJ Bill Good, the squadron S3, called medevac and again verified the status of 155-mm ammunition. I gave howitzer battery a fire mission calling for a WP marking round on the western edge of the rubber and instructed the fire direction center (FDC) to stay on the squadron command frequency. The firefight was only a short distance from the CP, and I was over the area in short order, getting an idea of the lineup. D Company and C Troop were on the move at this time.

CPT Starr: We were still moving up the hill well, despite increasingly heavy fire from the top. I detached my medic track and four 3d platoon vehicles under LT De Witt's command and sent them back toward Loc Ninh with the wounded. As LT DeWitt got about five hundred meters behind my rear security, they came under intense fire and had to return. Again, I thought of the original movement we had had, but could do nothing then but inform MAJ Bahnsen and CPTs West and Kramer of the new development.

As D Company arrived, they took up a position on my left flank, and C Troop closely followed them on my right flank. With the arrival of D Company, I again deployed the evacuation element, this time with the entire 3d platoon, to Loc Ninh for medevac. LT DeWitt encountered heavy resistance again about 5-700 meters to our rear, but was able to break out without further casualties and returned to Loc Ninh where the medevac was accomplished without incident. I ordered LT DeWitt not to attempt to rejoin the troop at that time but to remain in position.

MAJ Bahnsen: During successive passes over the western edge of the rubber plantation, I received heavy AA fire. All helicopters coming into



Sketch 3. B Troop detects movement, then takes fire as it approaches Hill 203. The enemy dispositions here are taken from a captured map. Later, it was determined that the enemy unit was the K9 Bn of 209th NVA Regiment.

the area were warned about this fire, but in spite of this, three helicopters were hit during course of the day. D Company moved at high speed to join B Troop, but they overshot the area and had to be led back to B Troop's location. This is typical of most linkups in a fast-moving firefight. This was also CPT Kramer's first contact as a company commanding officer.

C Troop Joins the Fight

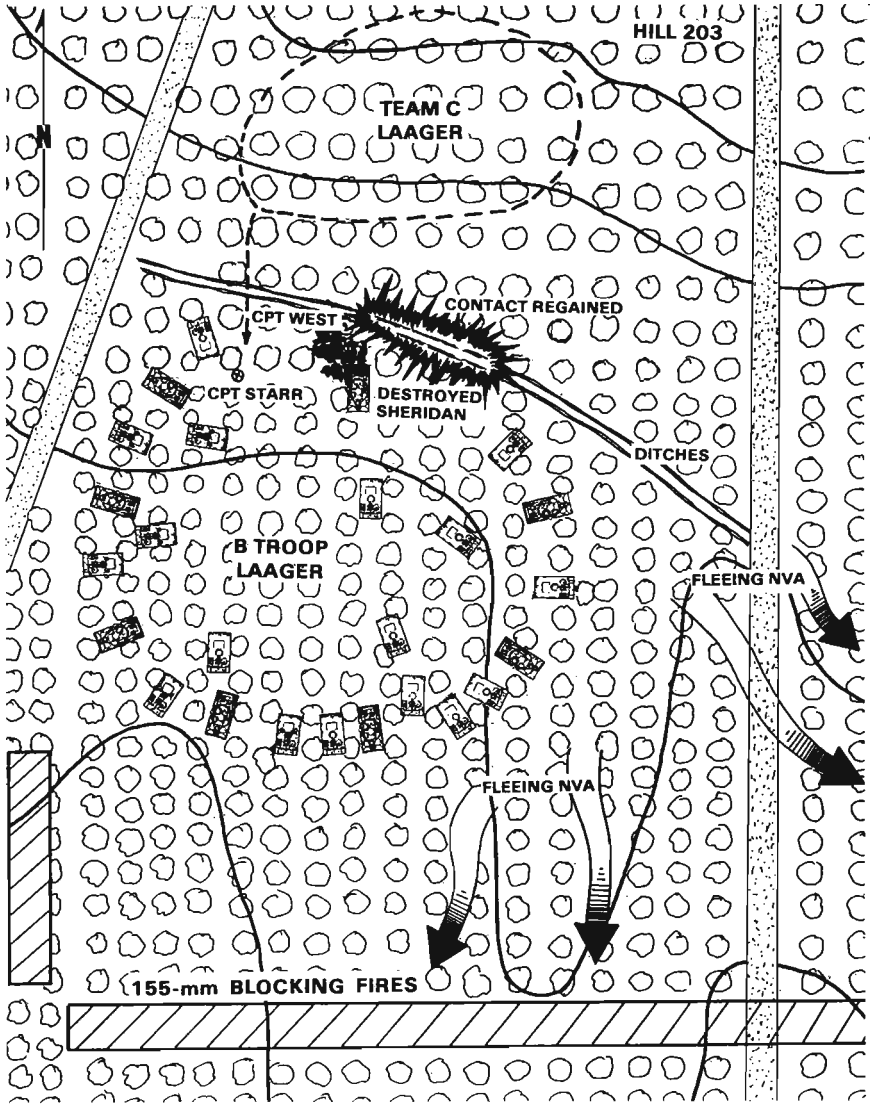
CPT West: On the morning of 6 September 1969, C Troop was located at its night defensive perimeter (NDP), approximately 8 km NE of Loc Ninh. The troop was scheduled to conduct a Reconnaissance in Force (RIF) to the east of its NDP, but had received permission to delay its departure in order to accomplish some much-needed maintenance. For the past several days, the troop had been conducting joint operations with two composite companies of Cambodian Civilian Irregular Defense Group (CIDG) troops from the Loc Ninh Special Forces camp. There were two U.S. advisors with the CIDG companies — SSG Stang and the team sergeant, an SFC whose name I do not remember. (In the past, it had been my policy to allow the Cambodians to turn in all captured weapons through Special Forces channels since they were paid for these weapons. After a number of successful — and for the Cambodians, profitable — operations, the troop never lacked for more than enough aggressive volunteers for join operations.)

Prior to 1000, the troop was notified that B Troop was in a firefight west of Loc Ninh and was alerted for a possible reinforcing mission. I alerted the Special Forces advisors and my platoon leaders — LT Bob Wiseman, 1st Platoon; SSG Bill Bathe, 2d Platoon; and LT Paul Baerman, 3d Platoon — of the possibility of having to go to the B Troop contact. I decided to leave 1SG Bill Chambers in charge of the NDP. He was to have the following vehicles: two Sheridans, (one was a combat loss, the other had sustained major combat damage) a borrowed light recovery vehicle, three mortar tracks, an M113 AVLB, and two troop headquarters ACAVs.

At approximately 1000, the troop was ordered to move to the B Troop contact. It left the NDP with one Sheridan (a 3d Platoon track) and 15 ACAVs with the two CIDG companies on board. The status of the six Sheridans remaining on the TOE was as follows: two Sheridans were down for combat damage and four were down for engines which gave out "busting jungle" outside the rubber.

The distance from the NDP to the contact area was 14 km. As the troop passed through Loc Ninh, it received word that contact had been broken and B Troop had taken casualties and had a vehicle knocked out. After passing through local PF troops guarding rubber workers, the troop went into its combat formation, which was similar to B Troop's rubber formation. At this time C Troop was approximately one kilometer from B Troop's location. The troop approached the contact area from the NE and stopped when it was 75 meters short of the B Troop vehicles (Sketch 4). I placed the troop in a laager. The CIDG forces were instructed to remain inside the laager. (I did not want my forces intermixing with those of B Troop). LT Paul Baerman was left in command as SSG Stang, a VN Special Forces type, 2-4 Cambodians, my right gunner SP4 Larry Boobar with a radio, and I walked down the hill to confer with the B Troop CO, CPT Doug Starr. CPT Starr filled me in on the results of his contact with the enemy. He stated the enemy had broken contact and that he thought the area was clear. SSG Stang and those with him went to help interrogate one of the POWs. I suggested that the Cambodians sweep the area of contact.

I then noticed that the Sheridan and a few ACAVs had broken out of the laager and were moving down toward B Troop. SP4 Boobar received word on the radio that some movement had been detected in some ditches between the laager and B Troop. I gave instructions for the remaining vehicles to hold fast, for those vehicles advancing to be



Sketch 4. As C Troop laagers near Hill 203 and commanders dismount, fighting breaks out again when NVA are spotted hiding in ditches.

careful with their .50-cals since B Troop was all around, and for my track to join us.

I angled through the rubber to intercept the advancing tracks. I did not realize that SP4 Boobar had run back to the command track instead of following me. I yelled to SSG Stang as I moved past a gutted B Troop Sheridan. Then all hell broke loose around me. The next five minutes was sheer chaos—AK-47 fire, RPGs, machine gun fire, grenades — both theirs and ours, and pistol fire. The memories are blurred: I remember having to reload my pistol (the only weapon I had) many times; an NVA broke and ran and everyone, NVA included, shot at him until he fell; shouting at tracks to try to prevent shooting into B Troop's men; and RPG boosters strapped on the backs of the NVA being set on fire by tracers.

In five minutes it was over. Twenty-three enemy had been killed within 50-100 meters of where I had been talking to the B Troop CO. This was done without wounding any man from B Troop. But it was not without a price. SP5 James Gray, who was acting as the loader on the Sheridan, had been killed by an RPG treeburst. The same burst had severely wounded the Sheridan's TC, SSG Jesse Crowe, platoon sergeant of the 3d Platoon. I didn't discover this until some time later and had to order SSG Crowe to the medic track. The team sergeant from the Special Forces camp had been wounded, along with several Cambodians.

At this time I ordered SP4 Barry Beaven, the senior troop medic, to take the wounded back to the squadron FSB. I detailed the 1st Platoon Sergeant, PSG Bill McQuire, to take two ACAVs and escort the medic track. (Beaven was a conscientious objector who volunteered to extend beyond his two-year commitment because he felt the troop needed him. Because he was a CO, his request was disapproved.)

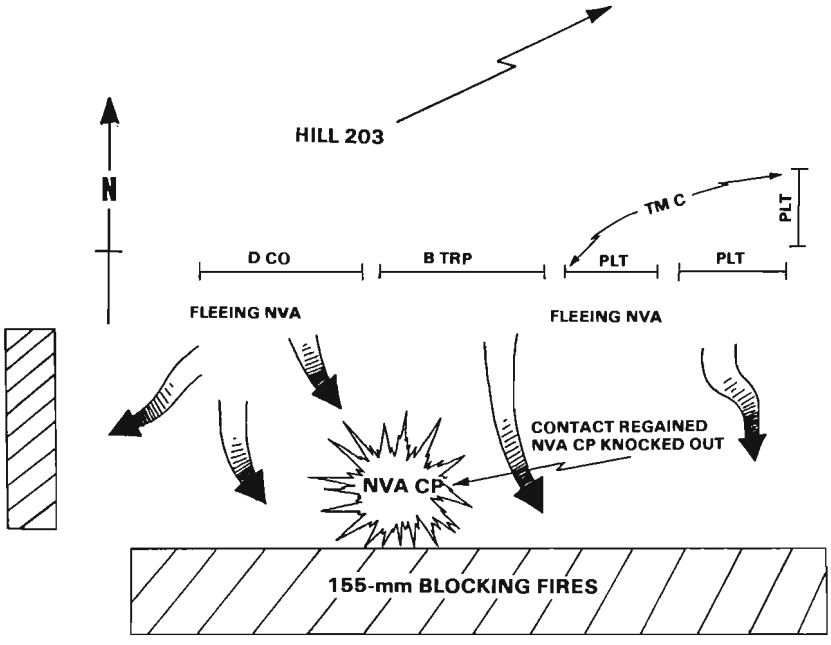
Sweeping the Area

The Squadron Commander then ordered the squadron to go on line and sweep to the SE. From left to right it was C, B, D. The CIDG companies were spread out behind the tracks. To protect the left flank (and the high ground), C Troop's formation was as shown in Sketch 5. There were one to two rows of rubber trees between the vehicles on line.

MAJ Bahnsen was forced to leave the area for fuel, and as senior troop commander, I was placed in temporary command of the ground forces. (This was squadron SOP unless the S3 or an assistant S3 was in the air overhead.) The sweep moved slowly while the howitzer battery continued to seal the area to the south with 155-mm fire. (Because of the vagaries of radio communication in the rubber, my interim troop CP track, C2, located 14 km away, had to function as a radio relay to squadron several times.) A short, sharp, contact developed at the junction between B Troop and D Company. CPT Starr reported that documents found on individuals killed confirmed that this was a battalion-size ambush. The squadron on line continued its sweep for about 800 meters, to the vicinity of a north-south road. The squadron (-) then reversed itself and reswept the contact area while the Cambodians performed a more detailed search of the area.

CPT STARR: The troop had reached the crest of the hill, C Troop and D Company were in position, and we had four prisoners that my ex-NVA Tiger Scout was questioning.

MAJ Bahnsen ordered that the three units reverse direction and move back down the hill toward my original suspected movement and toward the element that had made evacuation of the wounded so difficult. As the three units moved on line back down the hill (Sketch 5) *all three* came into contact with the



Sketch 5. D Co, B and C Troops reverse direction and move off Hill 203, sweeping the area and discovering NVA command group.

headquarters element of the original ambush (see Sketch 3) and a large portion of the ambush force which had managed to extricate itself and rejoin the command group.

The indescribable awe of the two cavalry troops and one tank company fully deployed on line and committed can perhaps best be described by depicting the captured NVA soldier I had on my track whose eyes reflected a curious mixture of terror, awe, sympathy for his comrades, and relief at being where he was instead of where they were.

Encountering moderately heavy contact most of the way, the three units made a semicircular sweep of about three kilometers during which it began to rain heavily. During this sweep the CIDG companies attached to C Troop dismounted and moved behind and between tracks to search the dead and to prevent anyone popping up behind the skirmish line and in front of the rear security. Their actions were a great contribution and led to the capture of a number of important documents, maps, etc. as well as to the knowledge that we had killed the entire command section of the K9 Battalion, 209th NVA Regiment. (The bodies of this command group were moved to the rear for intelligence purposes; i.e., identification.) Late in the afternoon, after resweeping the entire contact area and encountering no contact at all, MAJ Bahnsen gave the order for all three units to move toward a large clearing southwest of the original contact area on Hill 203.

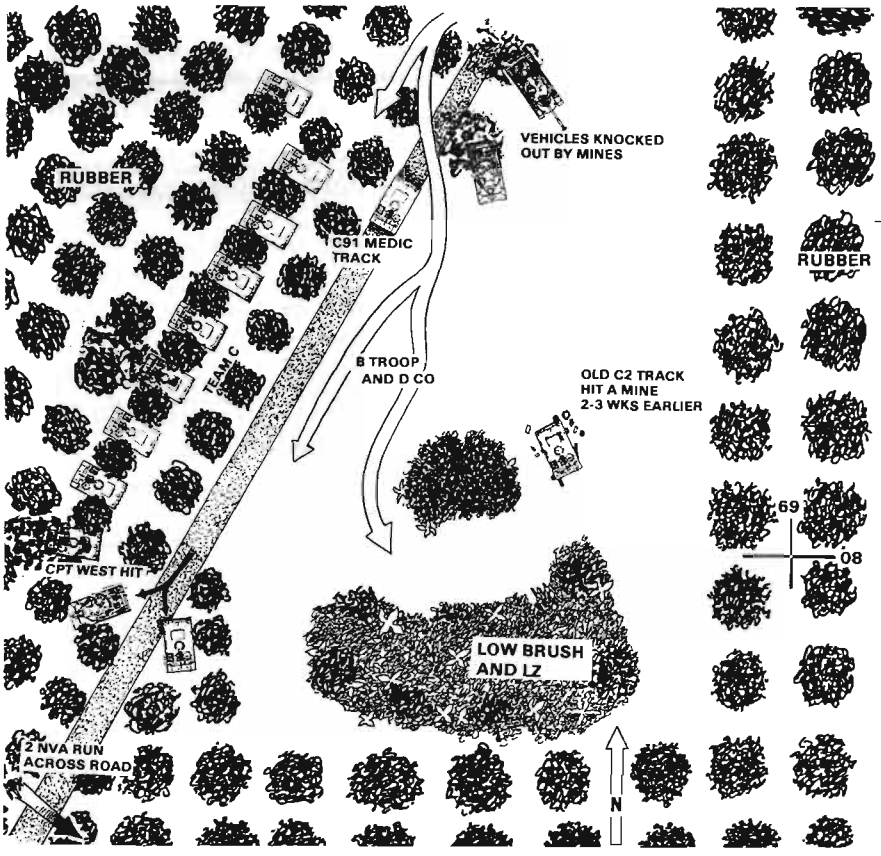
CPT WEST: After delivering the wounded to the FSB, PSG McQuire and SP4 Beaven were returning with their three tracks when they reported that the PF troops guarding the rubber workers west of Loc Ninh had one man wounded while killing one NVA and driving off some others. Beaven requested permission to take the wounded man back to Loc Ninh. Since there had been no enemy contact for some time, I gave him permission.

At this time, I received instructions from MAJ Bahnsen to move to a large clearing SW of the contact area for resupply and evacuation of the POWs. I informed him that the cleared portion of the area was mined. C Troop had lost its old C2 vehicle there two or three weeks earlier during a resupply mission. However, the far end of the clearing was covered by thick brush which could be pushed down to make an LZ. The B Troop and D Company COs were reminded about the mined area (see Sketch 6).

The CIDG remounted the C Troop tracks and some of B Troop's vehicles. The order of march toward the LZ was C, B, D. C Troop moved out with the Sheridan leading followed by the command track, 2d Platoon, 3d Platoon, and 1st Platoon. PSG McQuire with two 1st Platoon ACAVs and the medic track rejoined the troop at the tail of the formation.

Contact Regained

The troop moved down the western edge of the clearing and was nearing the far edge, when the lead and only C Troop Sheridan (now commanded by SP4 Mel LaFranchi) reported two men had run across the road in the rubber from right to left. I told LaFranchi to shoot at the SOBs. From my position behind the left machine gun in the trailing command track, I also saw the men, but did not fire at them because most side gunners have a tendency to shoot off the antenna when they attempt to fire straight ahead. I ordered the troop to deploy right and the Cambodians to dismount. The Sheridan roared ahead and veered off the road to the right when it reached the edge of the clearing. The command track was



Sketch 6. An old minefield claims two B Troop vehicles approaching C Troop near clearing where resupply and evacuation was to take place. Track in center of field hit mines weeks earlier.

on its right. The ACAV following me moved up and protected the Sheridan's left flank. About 15 seconds later and 20 meters into the rubber, there was an explosion directly to the right of my command ACAV, mortally wounding SP4 Boobar, the right gunner. The radio control box had been damaged, so that I lost communication. I climbed up from the floor to yell at the TC, SP4 Vernon Stahl. But when I pulled myself up to the rear of the cupola, I found Stahl unconscious from a wound in the back of his neck. Flak jackets had prevented my crew from being killed instantly. The driver, SP4 Robert Ferrar, completely oblivious that the rest of the crew was out of action continued to move ahead in formation. I finally managed to convey to him to stop and back up. With a damaged commo system, I attempted to inform Squadron that I had been hit and to order LT Baerman forward to take command.

The first man to reach the track was SP4 Beaven. He administered aid to the dying Boobar and unconscious Stahl before stretcher bearers moved them away. LT Baerman arrived soon after. I told him he was in command and tried to tell him what the situation was. He moved off in the command ACAV with the troop interpreter as his third crew member. SGT (E5) Earl Sizemore was now the 3d Platoon leader. (It was a policy in the troop to occasionally switch positions with the troop and the platoons. This was *not* the first time LT Baerman had acted as troop CO or Sizemore as platoon leader.)

As I was led back to the medic track, I passed a 2d Platoon ACAV that had received a direct hit, killing the TC, SSG Wayne Saunders, and wounding the crew. Apparently the few surviving elements of K9 Battalion had crossed our trail again as they continued to withdraw towards the jungle to the west of the rubber.

CPT Starr: Enroute to the clearing, with C Troop leading, my troop second, and D Company bringing up the rear, I heard heavy firing in the direction of C Troop and was unable to raise anyone from C Troop on the squadron command net. Again deploying the troop on line, I moved it into C Troop's formation and on line amongst them (Sketch 6). During this movement, one Sheridan from my troop and one tank from D Company hit mines, thus necessitating a hasty minesweep of the immediate surrounding area. Just as I got the formation straightened out, I informed the D Company commander of B and C Troops' deployment, and informed MAJ Bahnsen of the new situation. LT Paul Baerman, second in command in C Troop, entered the squadron net, informing us of CPT West's track being hit and CPT West being wounded, and requested instructions. No contact was being made and due to the terrain no further movement could be made to the west or southwest. MAJ Bahnsen ordered all three units to enter the clearing where the squadron would consolidate, evacuate the prisoners, and be given further orders (road-march back to our night defensive positions).

After all three units had entered and secured the clearing and the prisoners had been evacuated, MAJ Bahnsen briefed the unit commanders on the movement back to the airstrip to Loc Ninh and our deployment that night. The squadron began to move back to Loc Ninh at about 1730 after being in sporadic heavy contact since approximately 0940. The movement back was without incident despite the difficulty encountered in evacuating the disabled vehicles through the heavy mud, made even worse by the steady rain.

B Troop had two Sheridans damaged, approximately nine WIA, and no KIA. It had captured four NVA prisoners and made its contribution to the 74 NVA confirmed killed that day by the squadron.

MAJ BAHNSEN: Earlier my S3 had finally established contact with Team PAPA (Command ACAVs and A Troop's M551s) and directed them to the contact area. Flying weather at this time was marginal with light rain and fog; however, my helicopter crew took the POWs and wounded back to the CP in several sorties. It was not until this time that I was able to get on the ground and direct the units. Although control and communications are normally much better in the air,

"...Even with mixups and a mobile situation, attack of dismounted infantry with armor forces is a slaughter..."

the morale aspects of having the CO on the ground always outweigh these factors. My use of Team PAPA as an economy of force in escorting a convoy left me without my ground command section, and on this particular day was a bad decision on my part. On the other hand, had I used either B or C Troop on the escort mission, we might have been shorthanded with a large enemy force. It was my normal policy to pass command to my S3 when I had to refuel, or — as in this action — to the senior commander on the ground if the S3 could not get airborne.

Movement back to the CP area was uneventful except for trouble in evacuating several damaged vehicles.

Uncounted acts of heroism were performed on this date — CPT West, CPT Starr, and several others received Silver Stars for gallantry in action. CPT West's shootout with an NVA officer near the ditch only 25 meters from B Troop's burning Sheridan was only part of the personal nature of the fight. Seventy-four NVA were killed by actual body count and four NVA prisoners were taken. Three troopers from C Troop were killed in action and 36 men were wounded in action. The NVA prisoners confirmed that we had killed most of the leaders of the NVA battalion. POWs also confirmed the NVA unit as the K9 Battalion of the 209th Regiment.

Lessons Learned

Reflections on a contact of this type are numerous, and I will list only a few:

- B Troop's alertness and quickness of action in the initial stages of the contact on Hill 23 were instrumental in fixing the enemy.
- C Troop's and D Company's aggressive execution of the Blackhorse's "Pile-On" principle in moving to the contact proved valid again.
- The howitzer battery's and the Air Cavalry Troop's excellent support throughout a long day reinforce the knowledge that we need a variety of firepower on the battlefield.
- LT Baerman's rapid and smooth assumption of command of C Troop when CPT West was wounded shows the results of junior officers being trained in the next higher job.
- The fine support provided by the CIDG companies attached to the Squadron again proved invaluable.
- Having trained commanders at all levels ready to assume command when needed reflected well on the policy of rotating commanders and staff into different slots.
- The battle area must be thoroughly searched: just because the enemy stops shooting does not mean the fight is over, as C and B Troops found out while the COs were dismounted.
- Even with prior knowledge and a definite warning, tracks can be destroyed by old minefields, as in the case of D Company and B Troop in the clearing.
- Howitzer batteries under a squadron commander's direct control can be "used" more quickly and in general, can provide better, more responsive fire support.
- Command from a helicopter gives better communications and usually better visibility and control, but does not normally outweigh the morale aspects of sharing the ground troopers' hazards under fire once the enemy has been fixed and his destruction starts.
- Link-up in a firefight is normally difficult, and even when done with caution as demonstrated by CPT Starr and CPT West the unforeseen happens. CPT Kramer's moving past B Troop's position could have been a problem had the fight still been in progress at that time.

Even with mixups and a mobile situation, attack of dismounted infantry with armor forces is a slaughter. RPG teams and brave machine gunners die beside their comrades, and only the lucky shot and the flaming track can give solace to an infantry commander as his unit is usually decimated. Exceptions may exist, but the authors of this article believe that armor has a place on *any* battlefield, anywhere, anytime.

BRIGADIER GENERAL JOHN C. BAHNSEN was commissioned at West Point in Armor in 1956 and holds a masters degree in Public Administration. He is a graduate of the Infantry School basic course, the Armor School advanced course, the U.S. Army Command and General Staff College and the U.S. Army War College. Among his many duty assignments were those as staff officer, Operations Branch, Plans and Programs Division, Army Aviation Directorate, Office of the Assistant Chief of Staff for Force Development; Commander, Air Cavalry Troop, 11th Armored Cavalry Regiment, Vietnam; Commander, 1st Battalion, 32d Armor, 3d Armored Division, Europe; Director, Armor Training Task Force, USAARMS, Fort Knox, KY; and Chief of Staff, III Corps, Fort Hood, Texas. General Bahnsen retired on 30 June 1986.

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LIEUTENANT COLONEL DOUGLAS H. STARR was commissioned in 1967 from West Point. He is a graduate of the Airborne Course and the Ranger Course and from the Armor Officer Basic course. His duty assignments include 1st Squadron, 14th Armored Cavalry Regiment as platoon leader, XO and troop commander. He also served with the 1st Squadron, 11th Armored Cavalry Regiment in Vietnam as troop commander and S4.

Novel Tank Guns?

The Electromagnetic Rail Gun and the Liquid Propellant Gun Are Still a Generation Away

by Richard M. Ogorkiewicz

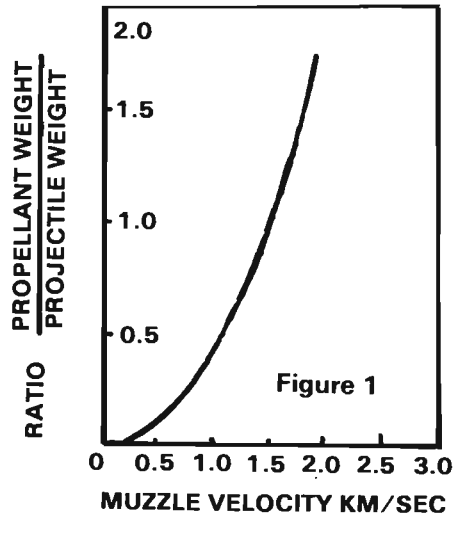
Much progress has taken place recently in the development of tank guns. An outstanding example of this is the high pressure 120-mm smoothbore guns which were first successfully developed in Germany by Rheinmetall and are now also being produced in the United States under the XM 256 designation.

The Rh 120 already arms the Leopard 2 tanks adopted by West Germany, the Netherlands, and Switzerland and is to arm the new Japanese TK-X tank. The 120-mm XM 256 is now being fitted in the latest, current production version of the US M1 tank, the M1A1. Other similar 120-mm smoothbore guns, capable of firing the same ammunition, are being adopted in France and several other countries. In fact, guns of this kind are set to replace the 105-mm M68 or L7 rifled guns as the standard tank guns of the non-Communist world.

The new generation of 120-mm tank guns represents a major advance on the currently used 105-mm guns and should be able to cope with the armor of enemy tanks for a good many years. However, tank armor is improving. Consequently, future enemy tanks will be more difficult to defeat. There will come a time, therefore, when even more powerful guns will be needed and it is not too early to start thinking about them.

Solid Propellant Guns

The guns with greater armor-piercing capabilities which will be needed in the future could well be a further evolutionary development of conventional solid propellant guns. They could even be of the same 120-mm caliber as the guns currently being produced. But if they were again of that caliber, they would have to fire APFSDS projectiles with a considerably higher muzzle velocity than the 1,650 m/s (5,400 ft/s) which is typical of current 120-mm smoothbore tank guns.



Graph illustrates the tremendous increase in propellant weight needed to increase velocity.

Muzzle velocities higher than this could certainly be achieved with solid propellant guns. More than twenty years ago, the Canadian Armament Research and Development Establishment (now the Defense Research Establishment Valcartier) had fired projectiles at up to 2,790 m/s (9,150 ft/s) from a modified 76-mm gun. Such high velocities may still be confined to experimental guns, but velocities of the order of 1,900 to 2,000 m/s (6,200 to 6,560 ft/s) are attainable with future tank guns.

Unfortunately, further increases in muzzle velocity would require disproportionately large increases in the weight of the propellant. As it is, at 1,650 m/s, the weight of the propellant is already as high as that of the projectile, and if the velocity were increased to 1,900 or 2,000 m/s, the weight of the propellant would have to be doubled. In consequence, the size and weight of the ammunition would increase considerably. In addition, the higher muzzle velocities would result in a further increase in the rate of bore wear, which is already a major problem with tank guns.

The alternative to higher muzzle velocities is an increase in the caliber of tank guns, and guns of 140- or 145-mm have been discussed.

The achievement of the required increase in the armor-piercing capability of tank guns by an increase in caliber instead of muzzle velocity involves less technical risk and avoids further deterioration in the life of gun tubes. But larger caliber

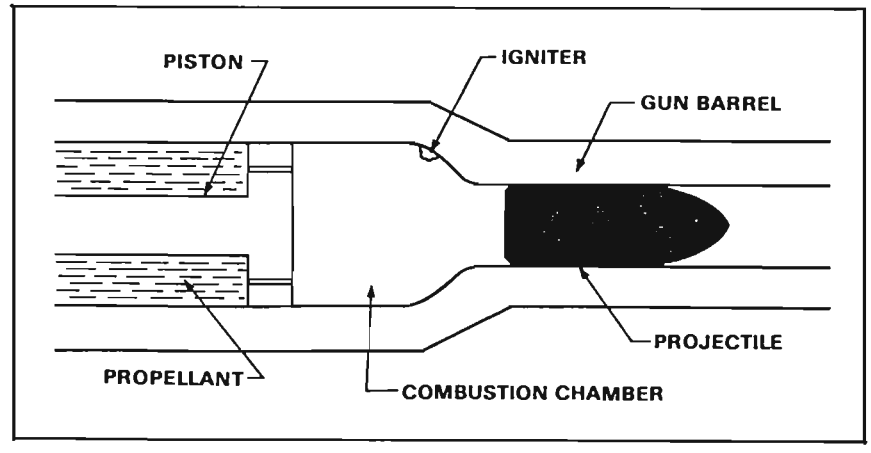


FIGURE 2. Illustration shows major components of the regenerative liquid propellant gun.

guns are inevitably more difficult to mount in tanks. They are, therefore, looked upon with greater favor by the designers of guns than by the designers of tanks. However, if they were to prove the best means of providing greater armor-piercing capability, tanks would have to be and can be designed to carry them.

Either approach obviously presents difficulties, and these have led to increasing interest in possible alternatives to conventional, solid propellant, guns. The principal candidates for succession are two novel types of guns, namely liquid propellant guns and electromagnetic guns.

Liquid Propellant Guns

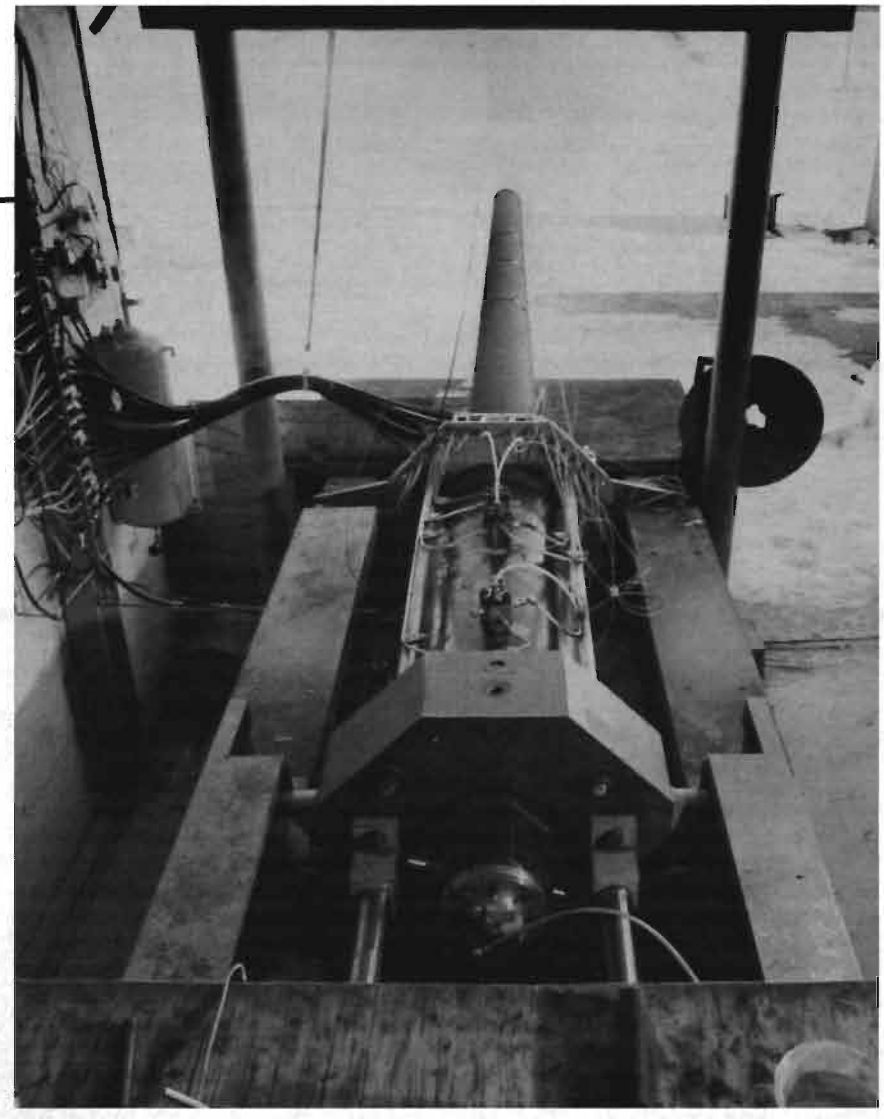
Liquid propellant guns are almost forty years old, but their development has been very intermittent. It started in the late 1940s, following the lead taken in Germany during WWII in the application of liquid propellants to rockets. Its first outcome was a number of experimental liquid propellant guns which were built and tested in the US during the 1950s. At about the same time, work on liquid propellant guns also began in Britain and led to the design of an 83.8-mm liquid propellant tank gun — which is preserved at the Royal Military College of Science as a teaching exhibit.

However, by 1960 the development of liquid propellant guns was virtually abandoned, largely because of the difficulties encountered. A major difficulty was the toxic and highly corrosive nature of the bipropellants which were used at the time. For example, one of the two components of a bipropellant that was used was red fuming nitric acid! As if the hazardous nature of their propellants were not enough, liquid propellant guns also failed to produce consistent results. Moreover, they were complex and appeared to offer no significant performance advantages over solid propellant guns.

As a result, there was little further interest in liquid propellant guns until the early 1970s. What was mainly responsible for the revival of interest which then took place was the development of new, single-compound monopropellants that were much safer and far easier to handle than the earlier liquid propellants. The new monopropellants were pioneered by the US Navy, but during the mid-1970s an attempt was made to exploit their advantages in what was originally the High Mobility-Agility Program and subsequently the Armored Combat Vehicle Technology Program. In fact, it was planned that the 75-mm solid propellant ARES gun, which was being developed for the HIMAG test bed vehicle, would be succeeded by a high velocity 75-mm liquid propellant gun. However, the development of the latter got no further than test fixtures and was terminated after two consecutive explosions in 1976.

Apart from being rushed, the development of the 75-mm liquid propellant gun ran up against the fundamental difficulties associated with the combustion of liquid propellant which is bulk-loaded, as it was in this case. Bulk-loading means that all the propellant is pumped into the chamber of the gun before it is ignited and was favored until then because it involved less mechanical complexity than the alternative method of regenerative injection of the propellant.

The basic feature of regenerative injection is that it does not involve pumping the propellant into the chamber of the gun, but into a reservoir separated from the chamber by a piston with injection orifices. Combustion in this case is initiated by an ignition train which pressurizes the chamber and, consequently, forces the piston back, causing some of the propellant to be injected through it from the reservoir into the combustion chamber, where it ignites. Then, as that pro-



General Electric photo shows the firm's test fixture used for its research on regenerative liquid propellant guns.

pellant burns, the pressure in the chamber rises, forcing the piston to inject more propellant into it.

Regenerative injection was tried in the 1950s and was used, among others, in the British 83.8-mm liquid propellant tank gun. But it was then abandoned because of the mechanical complexity it involved. However, in 1974 it was taken up again, this time by General Electric. Since then, General Electric has used its own resources to conduct a commendably systematic program of development of the regenerative injection monopropellant gun concept. The program involved hundreds of firings from 8-, 25-, 30- and finally 105-mm gun fixtures and the successful results it produced started another revival of interest in liquid propellant guns.

A very important consequence of this revival has been the award by the US Army of a contract to General Electric to demonstrate the viability of an artillery 155-mm liquid propellant gun, which is now being developed.

Work on liquid propellant guns is now also going on in Germany and France and, once again, in Britain. It will be some time before we shall see what emerges. But there is a good chance that, after the two earlier false starts, the development of liquid propellant guns will lead to success this time.

Success is likely not merely because it might be a case of third time lucky but because the most promising of the current development programs are bypassing the problems which defeated the earlier attempts to develop liquid propellant guns. This is particularly true of the regenerative injection monopropellant gun which is being developed by General Electric and which does not have to contend either with the hazardous propellants of the earliest liquid propellant guns or with the combustion problems of the bulk-loaded 75-mm gun of the mid-1970s.

Moreover, the internal ballistics of liquid propellant guns are now better understood than they were thirty, or even ten years ago. These differences between the past and present development programs need to be recognized as they are important to any assessment of the current efforts to develop liquid propellant guns. For this reason, they are described here in some detail.

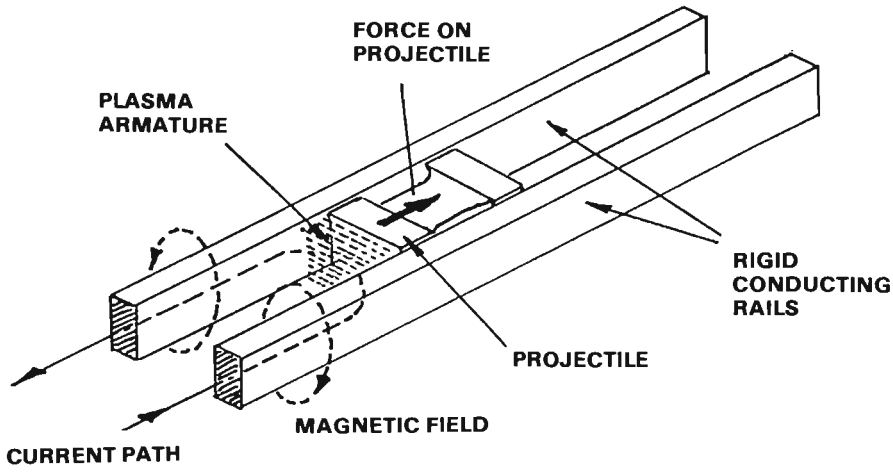


FIGURE 3. Principle of rail gun accelerator.

It should be noted, however, that although General Electric may successfully develop a liquid propellant gun for the artillery, it would be wrong to jump to the conclusion that liquid propellant guns will be equally suitable for tanks, whose requirements are obviously very different.

In fact, liquid propellant guns do not appear to offer all that many advantages over solid propellant guns as tank guns. In particular, there is no evidence yet that they would provide significantly better ballistic performance. Propellants in liquid form are certainly easier to stow in awkward or inaccessible areas of vehicles, and pumping them into the gun might be easier than loading charges of solid propellant. But the latter will be taken care of by systems for automatically loading projectiles, which are required with liquid propellant guns as well as solid propellant guns. Moreover, liquid propellant guns are more bulky and would, therefore, take up more space within the tank's armor envelope.

The most important advantage of liquid propellant guns from the tank point of view appears to be the low vulnerability of some of the monopropellants, which could increase significantly the survivability of tanks. On the other hand, liquid propellant guns are much more complex than solid propellant guns and are, therefore, inherently less reliable as well as being more costly to produce.

Thus, all the evidence available at the present time leads to the conclusion that liquid propellant guns are not, overall, a much better proposition for tanks than solid propellant guns. If this is the case, there is all the more reason to consider the other possible successors to solid propellant tank guns, which are electromagnetic guns.

Electromagnetic Guns

By comparison with liquid propellant guns, electromagnetic guns represent a much more revolutionary alternative to solid propellant guns. They are so revolutionary, in fact, that until a few years ago they were generally thought to belong to the realm of science fiction.

In reality, electromagnetic guns were already considered in France, during WWI, and some work was actually done on them in Germany and in Japan during WWII. However, a 1957 study carried out for the US Air Force Office of Scientific Research still held the view that electromagnetic guns were highly impractical.

It is only during the past decade that electromagnetic guns began to be taken seriously. Much of the interest in them stems from experiments carried out around 1970 at the Australian National University, where an electromagnetic launcher was used to accelerate small, 3-gram pellets to as much as 6,000 m/s, or more than three times the velocity of current APFSDS projectiles. Since then, considerable further research has been done on electromagnetic guns in the US Three years ago, Westinghouse ad vanced their development to the stage of launching 317-gram projectiles at up to 4,200 m/s (13,780 ft/s). The weight of the projectiles launched by Westinghouse is comparable to that of APDS projectiles fired from conventional 35-mm guns and showed that electromagnetic launchers are capable not

only of accelerating small pellets but also real-size projectiles.

Most of the progress to date has been achieved with one particular type of electromagnetic launcher, namely the rail gun. This consists basically of two parallel conducting rails which are connected to a power source and, at the same time, constitute the sides of the accelerator, or launcher, bore. When the launcher is used, current flows down one rail and in the opposite direction along the other, passing from one to the other through an armature that slides between them. This generates magnetic fields around the rails which, together with the current flowing through the armature, produce a force that accelerates the armature and, with it, any projectile.

The principle of operation of the rail gun is evidently simple, but in practice it requires very high currents and a considerable amount of electrical power. For instance, a 1 kilogram projectile launched at 3,000 m/s, which would have the kinetic energy approximately equal to that of an APFSDS projectile fired from an existing 90-mm tank gun, might require the generation of as much as 2 gigawatts (2 billion watts) during the launch period. If this amount of power had to be generated continuously, it would require a large power station!

Fortunately, guns are not fired continuously and the power which needs to be generated can be reduced to more manageable levels by building up energy during the time when projectiles are not being launched and then drawing on it during the short projectile launch periods. In practice, this means that the power produced by a prime mover is first stored in the form of the rotational kinetic energy of a flywheel, which is then drawn on periodically and converted into short pulses of electrical energy.

The conversion of mechanical into electrical energy takes place in homopolar generators, whose rotors also act as flywheels. The homopolar generators can, therefore, store the energy supplied by prime movers and, when connected by switchgear, produce the short pulses of high current electrical energy required by the rail launchers.

Some idea of the power that might actually be required can be obtained by considering the launching of the 1 kilogram projectile mentioned earlier at the modest rate of six rounds per minute. This would require a prime mover with a constant output of about 3,800 horsepower, which is more than twice the maximum power of the most powerful tank engines in use today. Moreover, even if the power demand were brought down to the level of tank engines — either by a lower rate of fire or by higher component efficiencies — their use to power electromagnetic guns would hardly be acceptable as it would deprive tanks, temporarily at least, of their mobility.

The power required by an electromagnetic gun calls, therefore, for a separate, dedicated, prime mover. The only suitable candidate for it is a helicopter-type gas turbine, the weight of which could be only 320 kilograms (706 lbs). However other components of the electromagnetic gun system would be considerably heavier. This applies not only to the homopolar generator, but also to the inductor, which is necessary to shape the energy pulse delivered to the rail launcher, and the launcher itself. In consequence, an electromagnetic gun would be two to three times as heavy as a comparable solid propellant gun.

Nevertheless, electromagnetic guns offer a number of important advantages. The most important of them is their ability to launch projectiles with much higher velocities than other types of guns. This implies greater armor penetration for a given size projectile, or the achievement of a given penetration with smaller caliber projectiles than with other types of guns. However, there is a limit to the extent to which caliber can be traded sensibly for velocity. The reason for it is that increases in velocity beyond a certain level provide little further increase in penetration.

The high projectile velocities offered by electromagnetic guns also imply flatter trajectories and shorter projectile flight times, which should lead to a greater probability of hitting maneuvering targets and might allow considerable simplification of fire control systems. The smaller caliber of electromagnetic guns would also mean that more projectiles could be carried in a tank and the smaller projectiles would be easier to handle by automatic loaders. In addition, there would be no spent cartridge case to extract and automatic loading would be greatly simplified by the open-breech nature of electromagnetic launchers. What is more, instead of propellants, electromagnetic guns would use nothing more vulnerable than kerosene or diesel fuel.

But electromagnetic guns also suffer from several serious disadvantages. Apart from their weight and bulk, the most serious of them is the rapid erosion of the launch rails caused by the high current arcing between them and the armature. Major problems are also posed by the switchgear, which has to carry very large current surges.

Some of the disadvantages of electromagnetic guns may be eliminated, or at least reduced, by further development, which might make them more suitable for tanks than they appear to be at present. After all, electromagnetic launchers are only a few years old and there is plenty of scope for further development. But this is bound to take time and it would be unreasonable to expect electromagnetic tank guns to become practicable in the near future, even under the most favorable circumstances.

In the meantime, it is necessary to continue the development of solid propellant tank guns and to produce at least one more generation of them.

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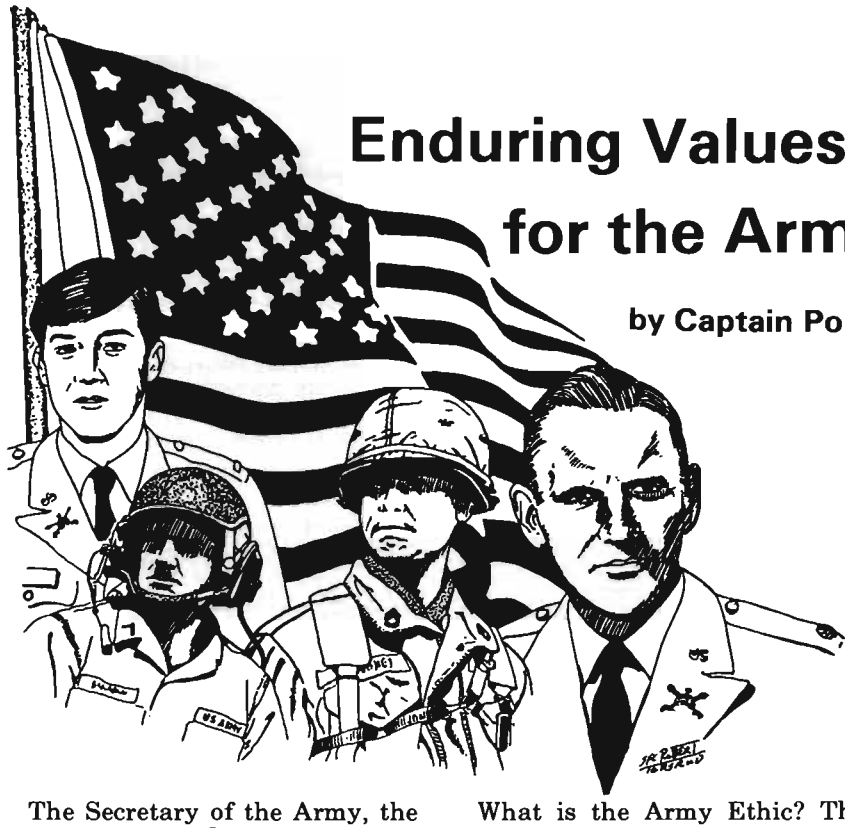


Enduring Values for the Armor Leader

by Captain Porcher L. Taylor, III

The Secretary of the Army, the Honorable John O. Marsh, Jr., and the Army Chief of Staff, General John A. Wickham, Jr., have jointly declared "Values" to be the Army's theme for 1986.

That being so, now is a time for us to reflect on the essential values and principles of our military profession. In my two and one-half years as a member of the Staff Judge Advocate's office at Fort Knox, I have had a number of opportunities to interact professionally with and to observe many of you in the Combat Arm of Decision. Even though I am a former "redleg" battery commander, I offer you seven enduring values and principles that I believe are the foundation for becoming a successful, consummate armor leader. I have listed them in my personal order of priority. They are:

Keep and Teach the Army Ethic

A leader cannot give mere lip service to the Army Ethic. He must believe it, practice it and live it. At the same time, that leader must instill the Army Ethic in his subordinates. A leader becomes a hypocrite and will lose the respect and credibility of his soldiers if he **preaches** but does not steadfastly **live** the ethical basis of our Army.

What is the Army Ethic? The Army Ethic is not an esoteric nor an elusive term. On the contrary, it is "the bedrock of all that we do in the total Army."[1] It is the essence of our continuance as professional soldiers. The Army Ethic consists of enduring values:

- Loyalty to the country and the Army.
- Loyalty to the unit.
- Personal responsibility.
- Selfless service.[2]

Let us take a brief look at these paramount values.

Imagine, if you can, an American Army where its leaders and soldiers do not have a fervent passion and love for America. Then imagine that same Army where the great majority of its leaders and soldiers do not have a burning zeal for the Army. In such a setting, our national security would be in daily jeopardy and our fighting force would lie on the brink of collapse.

Unquestionably, a soldier's supreme loyalty must be to the Army and the defense of the nation. This value has been a part of this nation since its inception and will remain as a prime unifying force in the future.

As I see it from my legal officer's viewpoint, a combat unit cannot fight effectively if its individual soldiers do not honor their critical functions in the overall fighting scheme.

When an armor task force deploys to the National Training Center at Ft. Irwin, CA, every soldier must faithfully perform his critical tasks if the task force is to defeat the OPFOR decisively. Whether in the motor pool or at the NTC, a soldier must not do anything that would compromise the integrity of his unit. But a soldier's loyalty to his unit must be bolstered by and strengthened with the concomitant awareness of his personal responsibility and selfless service.

A soldier must have a sense of personal responsibility toward his physical condition and the condition of his equipment. Whether he is passing the APRT or marching 20 miles with a full combat load, a soldier must prepare for the rigors of the future battlefield by diligent pursuit of peacetime physical conditioning. At the same time, a soldier must take good care of his assigned equipment. Whether it is his radio, his night-vision goggles, or his mess gear, a soldier must develop a strong sense of personal responsibility toward the care and maintenance of his equipment.

At times, we call upon a soldier to make a personal sacrifice for the sake of the unit's mission. Such effort could range from long hours on guard duty to long road marches in desert terrain. Selfless service is necessary to persevere through the many demands that our profession often places upon us. In my opinion, selfless service is the inherent theme of the entire Army Ethic, for it generates loyalty both to the country and to the Army, as well as loyalty to the unit.

As soldiers, we are servants of the nation, the vanguards of freedom, the substance of national security. We cannot faithfully and effectively perform this mission without a willingness to sacrifice through selfless service.

Understand the Potentially Detrimental Impact of Moral Force

Moral force is the intangible influence that comes to bear upon the soldier's will to fight. As one Armor officer has observed, moral force is the "psychological influence that has given the OPFOR the occasional battlefield edge over friendly forces at the NTC."

General Richard E. Cavazos, former FORSCOM commander, described the advance of the British forces in the Falkland Islands as "a classic example of one force imposing moral ascendancy over another, and of the moral effect of that imposition." From his perspective, General Cavazos believes that fear (physiological and psychological factors) constitutes the moral force that eventually results in moral effect.

The eminent military scholar, Karl von Clausewitz, saw the "moral forces" on the battlefield as the ultimate determinant of war. To Clausewitz, moral force is the "precious metal, the real weapon, the finely-honed blade."

Accordingly, an active and concerned leader can scarcely ignore the moral factors that bear upon his soldiers' abilities to fight. Indeed, the lack of moral force has the potential to impede the combat mission. Armor leaders must recognize and understand the effect that this force can have on the soldier — as well as on themselves.

General Cavazos is concerned that in the "heat and angry iron of battle," moral force may completely immobilize even the "very technically competent, purposeful officer who would be described as the epitome of the leader." No one is immune to the pull of moral force.

Study Leadership

Although "leadership" was the Army's 1985 theme, it stands as an enduring value and principle. Every Armor leader should have his personal, professional library of essays and scholarly works on leadership. A critical study of leadership can enhance a leader's ablity to lead. The study of the famous captains of history can give us insights into the qualities that make an effective leader.

Know Your Soldiers

Total leadership requires that a leader not only know the names and backgrounds of his soldiers, "but also their personal values, goals, and aspirations."[3]

A leader cannot afford to have a shallow relationship with his soldiers. If an NCO desires to attend the Advanced Noncommissioned Officer Course (ANCOC), then his leader should keep that fact in mind. In fact, a conscientious leader would groom that NCO for ANCOC.

Strive for Compassion and Concern

The former Army Chief of Staff, General Edward C. Meyer, has given us a relevant thought on concerned leadership: "Neither the soldier nor his comrades will survive the first challenge of either the modern world or of the battlefield outside a climate of active and concerned leadership.

Active and concerned leadership means genuine compassion, concern, and respect for subordinates. Soldiers must be honestly convinced that their leaders are truly concerned about their welfare and that of their families. For soldiers to think otherwise is disastrous.

Know AirLand Battle Doctrine and Maintain Technical Competence

When one considers that successful accomplishment of the AirLand Battle (ALB) mission will demand mastery over synchronization, agility, initiative, and depth, it becomes apparent that many obstacles can impede the mission. Flawless coordination with the tactical forces of the other services will strain the organizational and decision-making skills of even the best leaders. Despite this complexity, the defeat of the enemy remains undiminished as the ALB mission. To this end, the armor leader must fully grasp ALB doctrine and maintain his technical competence in all areas.

Know the Law of War

The Roman poet, Cicero, once stated, "Inter Arma Silent Legis" — "during wartime, the laws are silent." Unfortunately, this perception, taken out of its original context, has caused catastrophic problems on past battlefields. Every Armor leader needs to take the Law of War seriously. Although the primacy of the mission is to defeat the enemy, we cannot ignore the fundamental principles of military necessity, proportionality, and unnecessary suffering. The Law of War need not be a stumbling block to victory. Rather, it establishes that we must consider combat decisions in a viable, legal framework.

I would submit that if we fully embrace, fully believe, and fully apply the foregoing values and principles, we are well on our way to becoming a successful Armor leader.

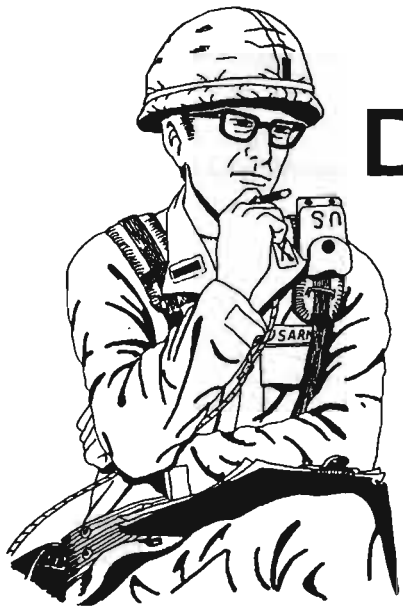
Footnotes

[1]DA Message on "Values" by Secretary of the Army and Chief of Staff of the Army, as reported in ARNEWS.

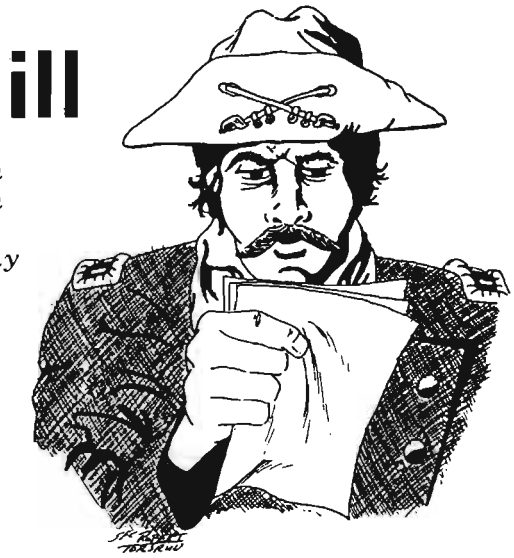
[2]*Ibid.* Field Manual 100-1, *The Army* (August 1981), page 24, establishes these four "fundamental and enduring values of the Army ethic."

[3]Sam C. Sarkesian, "A Personal Perspective", *Military Leadership* ed. by James H. Buck and Lawrence J. Korb, Sage Publications, Beverly Hills, London 1981, pp. 244-245. To this end, a concerned leader can "shape his own style to maximize his impact" on his soldiers. *Ibid.*

CAPTAIN PORCHER L. TAYLOR III was commissioned in the Field Artillery after graduation from West Point in 1975. He is a graduate of the Airborne School and the FA Basic Course and served in battalion and battery staff positions while assigned to III Corps Artillery, Fort Sill. Selected for the Funded Legal Education Program, he earned a law degree at the University of Florida, graduated from the JAGC Basic Course, and was assigned to Fort Knox, serving as brigade trial counsel, legal advisor, and administrative law officer. This past spring, he attended the Combined Arms and Services Staff School, Fort Leavenworth, and now serves in the FRG as an attorney in the Office of the Judge Advocate, HQ, USAREUR, International Law Division.



Dear Old Bill



Successful recon and counter-recon at the NTC has been the obsession of scout platoon leaders for countless rotations. We can find many insights into achieving success in the replies from Old Bill to the hundreds of desperate scouts who write him for advice regularly. These are some of Old Bill's favorite letters.

Dear Old Bill: My battalion commander is a hard-boiled old grunt who thinks the only effective way to gather detailed intelligence is through long-range dismounted operations by the scouts. Though I have never been to the NTC before, I don't necessarily agree. What do you think? Sign me:

—Lt. Blisterfoot

Dear Lt. Blisterfoot: While, of course, the factors of METT-T play an important role in your decision-making process, I can tell you from experience that there are very few instances where you should have to walk more than two or three Ks to put yourself inside enemy positions. Effective use of terrain and slow, deliberate, movement with the use of all available night observation devices (NODs) (or binoculars in daytime) can put you and your tracks undetected at the enemy's front door. One other point that might surprise you: You know how sometimes at night the scouts in your sister battalion get tired, and go to sleep, or get cold and hunker down in their vehicles? This happens to OPFOR soldiers, too. Zero illumination and the cold wind are your friends who want to help you. Let them!

—Old Bill

Dear Old Bill: I have a problem with my scout platoon leader. When our mission calls for dismounted infiltration into enemy positions for intel gathering only, he puts together a 12-man combat patrol that he invariably insists on leading himself. I have tried to tell him that a buck sergeant with a RTO can gather just as much intel with a lot more stealth. Help us settle this. We have a dehydrated pork patty riding on your opinion.

—SFC Knapsack

Dear SFC Knapsack: I'm with you for several reasons. First, as you brought out, is the matter of stealth. A large combat-loaded patrol will attract a lot more attention than a couple of guys strolling around as if they belonged in the area. Also, three two-man patrols can cover much more ground than one ten-man patrol. Effective management of resources (men, equipment, and time) will allow for greater mission accomplishment four or five missions later. If he takes all the scouts out dismounted, he is losing flexibility in combining mounted, dismounted, and air-inserted recon operations. One final piece of advice: If your lieutenant doesn't start learning to count on his subordinates now, he is going to be NMC (not mission capable) after the second mission.

—Old Bill

Dear Old Bill: My battalion commander insists on deploying my scout platoon as a combat element instead of an intel-gathering asset. What can I do about this? Signed,

—Lt. Doomed

Dear Lt. Doomed: Nothing. He's the boss. But he will see the light after you live up to your name on the first mission. On the other hand, he may not see the light, because he will have lost his "eyes."

—Old Bill

Dear Old Bill: I just want to pass on an experience I had from my last rotation. It had rained the night before I took my scout section, mounted, into a new area of interest for the task force. Although we infiltrated into the OPFOR position at night, mounted, with great success, guess what happened when the sun came up? A BMP followed my track prints in the sand right into my position and neutralized my entire section. That's something to think about.

—SSG Sharp

Dear SSG Sharp: That certainly is worth passing on to our fellow scouts. Going back to cover tracks, stopping short of the position and going dismounted, or looking for rocky surfaces to drive on are three ways to combat this problem.

—Old Bill

Dear Old Bill: I'm not a scout, but I work a lot like one when I can work. You see, at the NTC I frequently can't work because my tracks don't have fuel; my soldiers don't get fed; I don't receive realistic missions; and I get crummy maintenance support. Have you guessed who I am yet? Right! I'm the GSR section leader. Signed:

—SGT Spook

Dear SGT Spook: I have a solution to your problem. Talk to your chain of command about having your section *attached* to the scout platoon. This relationship will hold the scout platoon leader's feet to the fire on including you in his logistical support plan. It will also allow you to work together on the ground in integrating the forward intel-gathering effort. I'm not suggesting the scout should take over the S2's duties, but the S2 is not going to be forward with you in all likelihood. Note to the scout: *Before* you deploy, you had better do your homework on GSR employment.

—Old Bill

Dear Old Bill: My battalion has trouble passing intel that my platoon gathers in a timely manner so that everyone who needs it can use it. I've tried reporting several different ways. What do you recommend? Signed,

—SFC Hollerloud

Dear SFC Hollerloud: You should definitely report on the battalion command net for three main reasons. First, all of the key consumers of intel (TF Cdr, team commanders, key staffers) monitor this net. They can get the info first-hand and act now if it has immediate impact on them. Secondly, these same "intel consumers" can request clarification or elaboration directly from the source and minimize the risk of convoluted, hand-me-down messages. Finally, reporting on the battalion command net allows the TF commander to talk directly to his "eyes."

A good idea is for the S2 to eavesdrop on the scout internal net if possible. This action allows him to monitor reports coming directly to the scout platoon leader from his subordinate sections firsthand, and gives him the opportunity to request clarification immediately.

Also, don't forget other sources from which you can gain information. It is a good idea (particularly in the defense) to drop down to the air defender's net and find out if they have seen anything. Since they should always be scanning skyward, they may spot the OPs that the OPFOR characteristically places on hilltops with observation into the friendly positions. The engineers are also a good source as they are usually around the obstacles that the OPFOR is seeking. Support elements moving along the roads might also spot enemy activity. Don't overlook any possible source of intel.

That may sound basic, but remember to send periodic negative sitreps. Where the bad guys ain't is just as important to the commander as where they are. It also serves to reassure the commander that his "eyes are open."

SGT Hollerloud, remember your COMSEC. The OPFOR can and will find your internal net and glean valuable intel from you if you let him. Your net is one of his favorite sources of intel. If your platoon is not operating secure, with *Vinson,* ask your boss why not.

—Old Bill

Dear Old Bill: I just joined a scout platoon. One of my first missions was to set up a screen forward of the defending force, and I set up my OPs on line, just like the overlay showed. My platoon sergeant wanted to shift them to some high ground, but anybody could see that the line on the overlay didn't go where he wanted the OPs. Where did you put your OPs when you were scouting?

—2LT Shinybar

Dear 2LT Shinybar: OK, here's your criteria for selecting OP sites. OPs should be on high ground from where you can observe the greatest area of the battlefield, not necessarily the maximum distance forward of the task force. There is no reason to make an already tough logistical problem tougher and increase your risk if you don't need to do so. In some instances, OPs may be lateral to, or even behind, some team battle positions. In general, high and forward, as a combination, works best. Also, be sure to place yourself in a position from which you can best see the battlefield and from where you can best manage your resources. The "John Wayne" approach, always placing yourself furthest forward or in the riskiest position, can get you killed early or place you in a position where you lose flexibility in managing the task force's most important single asset.

—Old Bill

Dear Old Bill: On my first NTC rotation, my scout platoon got shot everytime we displaced off of a screen. Sometimes it was hostile fire, sometimes friendly, but "dead" is "dead" regardless of who shoots. Regardless of how well the coordination was effected, we never could conduct a successful passage. I know you have high-tailed it with Injuns hot on your trail back toward the main body many times. How did you survive it? Sign me:

—Frustrated

Dear Frustrated: Massive amounts of coordination and rehearsal are necessary for the successful displacement of the scout platoon from the forward screen of the defending task force. Lanes through obstacles, recognition signals, direct- and indirect-fire coordination, logistical support, and alternate positions are just a few considerations. You must repeatedly rehearse this precise coordination to achieve even marginal levels of success.

A little known fact is that I did not always "high-tail it." Sometimes me and my trusty mount would let the Injuns pass us by, and we would continue our mission undetected.

How can this apply to you? Don't displace. By placing your tracks in well-concealed positions and digging in your dismounted OPs on high ground, the OPFOR will pass and never see you. For this technique to work, the task force commander must be committed to the principal of employing you as an intel-gathering asset and not as a combat force. This means, of course, that you will not engage the enemy with direct fires. There are numerous advantages to this technique. You can continue to call fires on all follow-on units, and continue to report on them. You can continue to call fires and report the enemy's movement after they have passed your position and the task force is in contact. In all likelihood, the view to the task force commander's front is obscured by smoke and dust. The intel that you can provide on the enemy's movements will be invaluable to the commander.

After the friendly defense has succeeded, you still have many options. You can call fires in on the retreating enemy. You can move under cover of darkness to gather intel on the now defending enemy in preparation for the friendly

counterattack, or conduct operations to disrupt operations to destroy enemy elements with your assets. Sounds risky? I never said scouting was easy, only fun!

—Old Bill

Dear Scouts: In closing, I want you to reconsider some key points. First, use the factors of METT-T to lead your resources. Don't use too much or too little; don't walk too far or too short, or work too hard. The NTC will beat you physically as hard as you let it. Second, intel that is late and inaccurate is no good. Train your scouts to send timely, accurate, reports in a set format (SALUTE or SALT) everytime. A faulty grid now is worse than a correct grid in 30 seconds. Third, build a relationship between yourself, the S2, and your commander. The more teamwork you you develop, the more you will earn the trust to tell them you are working too hard, or not hard enough. Sell your product. Commit yourself to the principle of acting as an intel asset and not a fighting force. Instill this principle in your scouts and convince them that "real scouts don't shoot" (unless they have to).

Finally, be bold, aggressive, and creative, and instill these characteristics in your subordinates. Look for the untried, smart way to accomplish the mission. Don't be afraid to attempt the easy, obvious way. It will probably work. Do you want to be supplemented with an infantry squad or a tank section for the next mission? How about a Blackhawk? You won't get it if you don't ask.

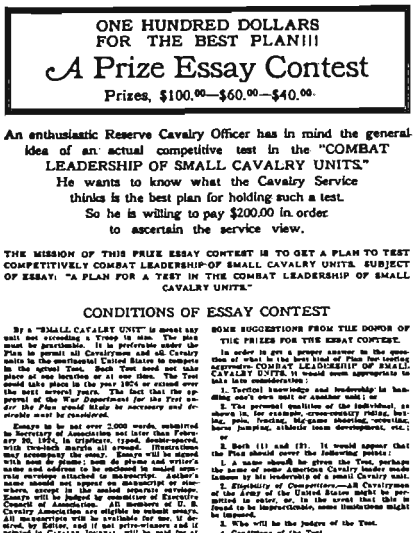
Have Fun!

Scouts out!
Old Bill

"Old Bill" received extensive help in preparing this article from First Lieutenant Michael S. Todd.

FIRST LIEUTENANT MICHAEL S. TODD was commissioned from ROTC as a Distinguished Military Graduate at Middle Tennessee State University, where he earned a bachelor's degree in Political Science in 1983. He attended the Armor Officer Basic Course and has been a tank platoon leader and scout platoon leader with the 64th Armor, Fort Stewart, GA, before being assigned as aide-de-camp to the Assistant Division Commander - Support, at Fort Stewart. He has participated in three NTC rotations as a tank platoon leader, antitank platoon leader, and scout platoon leader.

Armor Leadership Writing Award



ONE HUNDRED DOLLARS
FOR THE BEST PLAN!!!

A Prize Essay Contest

Prizes, $100.00—$60.00—$40.00.

An enthusiastic Reserve Cavalry Officer has in mind the general idea of an actual competitive test in the "COMBAT LEADERSHIP OF SMALL CAVALRY UNITS."
He wants to know what the Cavalry Service thinks is the best plan for holding such a test.
So he is willing to pay $200.00 in order to ascertain the service view.

THE MISSION OF THIS PRIZE ESSAY CONTEST IS TO GET A PLAN TO TEST COMPETITIVELY COMBAT LEADERSHIP OF SMALL CAVALRY UNITS. SUBJECT OF ESSAY: "A PLAN FOR A TEST IN THE COMBAT LEADERSHIP OF SMALL CAVALRY UNITS."

CONDITIONS OF ESSAY CONTEST

By a "SMALL CAVALRY UNIT" is meant any unit not exceeding a Troop in size. The plan must be practicable. It is preferable under the Plan to permit all Cavalrymen and all Cavalry units in the continental United States to compete in the actual Test, and not take place at one location, or at one time. The Test should take place in the year 1924 or extend over the next several years. The fact that the approval of the War Department for the Test under the Plan would likely be necessary and desirable must be considered.

Essays to be not over 2,000 words, submitted to Secretary of Association not later than February 20, 1924, in triplicate, typed, double-spaced, with two-inch margin all around. Illustrations may accompany the essay. Essays will be signed with a pen name and writer's name and address to be enclosed in sealed separate envelope attached to manuscript. Another's name should not appear on manuscript or elsewhere, except in the sealed separate envelope. Essays will be judged by committee of Executive Council of Association. All members of U. S. Cavalry Association are eligible to submit essays. All manuscripts will be available for use, if desired, by Editor, and if not prize-winners and if printed in CAVALRY JOURNAL, will be paid for at usual rates. In case no essays submitted in addition of judges, are received, no prizes will be awarded. Judges will consider, in a heavy degree, also literary merit, interest, instructional value, original thought and research, presentation, readability, and attractiveness.

KEEP FIRMLY IN MIND THAT THE MISSION OF THIS PRIZE ESSAY CONTEST IS TO GET A PLAN TO TEST COMPETITIVELY COMBAT LEADERSHIP OF SMALL CAVALRY UNITS.

NOTE.—Should a feasible plan be found for such a Test, it is possible that $1,000.00 will be available as prizes to be awarded competitors in leadership.

SOME SUGGESTIONS FROM THE DONOR OF THE PRIZES FOR THE ESSAY CONTEST.

In order to get a proper answer to the question of what is the best kind of Plan for testing aggressive COMBAT LEADERSHIP OF SMALL CAVALRY UNITS, it would seem appropriate to take into consideration:

1. Tactical knowledge and leadership in handling one's own unit or another unit; or

2. The personal qualities of the individual, as shown in, for example, cross-country riding, hurdling, polo, hunting, big-game shooting, wrestling, horse jumping, athletic team development, etc.; or

3. Each (1) and (2). It would appear that the Plan should cover the following points:

1. A name should be given the Test, perhaps the name of some American Cavalry leader made famous by his leadership of a small Cavalry unit.

2. Eligibility of Competitors.—All Cavalrymen of the Army of the United States might be permitted to enter, or, in the event that this is found to be impracticable, some limitations might be imposed.

3. Who will be the Judges of the Test.

4. Conditions of the Test.

5. Prizes.—Should the prizes be given to individuals, to units, or to the leader and his unit in some proportion? What should be the proportion of the prize-money by the winners? Should it be understood that the winner, if an individual, will use it for some purpose directly connected with his profession, such as purchase of mounts, a hunting trip, etc.?

The donor is not desirous in these details; these are merely the points which arise in his mind as in the Test, plans for which are to be submitted in the Prize Essay Contest.

The 1924 Cavalry Journal announced a "Prize Essay Contest" that led to present Draper Award.

ARMOR Magazine is proud to announce an essay contest to promote leadership in Armor and Cavalry units. A $1,000 prize will be awarded to the best essay on leadership submitted for consideration.

Essays **not over 2,000 words** are to be submitted to the editor of *ARMOR Magazine* **not later than 1 April 1987, in triplicate, typed, double-spaced, with two-inch margin all around.** Illustrations may accompany the essay. **It must be an original manuscript, written solely for separate publication.**

The manuscript cannot be submitted if the article was initially written for official publication (i.e., ARs, FMs, etc.). The exception to this will be outstanding writing requirements submitted on the subject of leadership while fulfilling the Armor Officer Advanced Course or Command and General Staff College writing requirements.

Essays will be signed with a pen name. The pen name and writer's name and address should be enclosed in a sealed, separate envelope attached to the manuscript. The author's true name should not appear on the manuscript or elsewhere, except in the sealed, separate envelope.

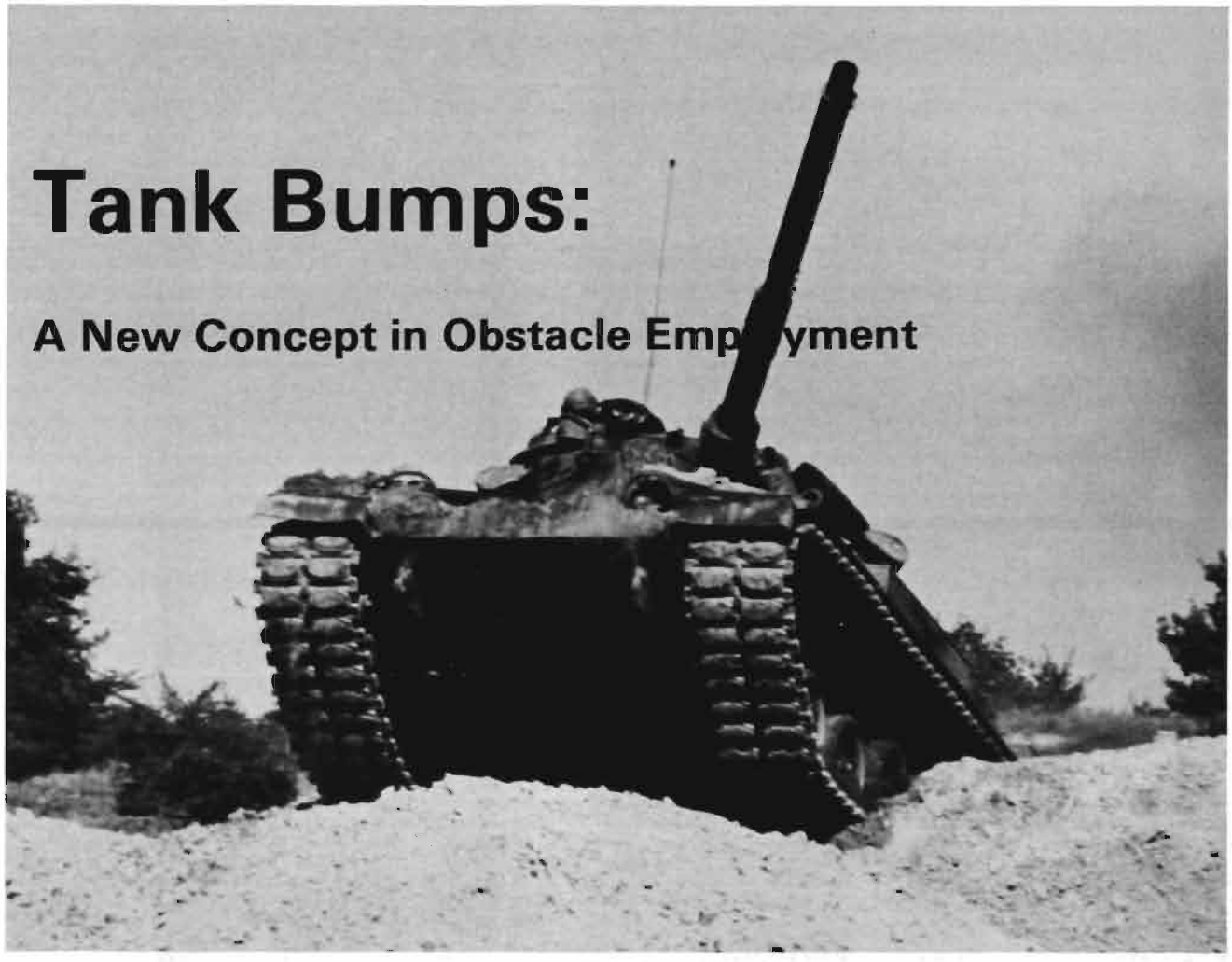
Essays will be judged by the Draper Combat Leadership Trust Fund Council and the Editor-in-Chief of *ARMOR Magazine.*

The contest is open to all officers, warrant officers, and enlisted men in the Active, Reserve, or National Guard components who are members of an Armor, Cavalry, or Air Cavalry (assigned to a ground Armor or Cavalry organization) unit or who hold an Armor military occupational specialty (MOS), regardless of current assignment.

This contest is sponsored by the Draper Combat Leadership Award Fund and is intended to promote leadership in Armor and Armored Cavalry. The Draper Combat Leadership Award, which recognizes excellence in Armor and Cavalry, began in January, 1924, with the announcement of a similar essay contest in the *Cavalry Journal.*

Tank Bumps:

A New Concept in Obstacle Emp yment



M60A3 used in tank bump test exposes its belly as it climbs berm.

by Captain Stephen J. Ressler

In early 1969, Colonel Thomas L. Beale, then a captain in command of B Troop, 1-1 Cavalry Squadron, watched anxiously as his tanks maneuvered across the rice paddies of the Republic of Vietnam. He discovered that the low earthen dikes which crisscrossed the paddies severely hindered the movement of his armored vehicles, and that tanks could cross them only at very low speed, or risk breaking several torsion bars in the process. Of even greater concern was the perilous orientation of the tanks as they crossed the dikes. As each vehicle traversed a dike, it presented a very lucrative target to any enemy antitank weapon within range. While ascending, the vehicle exposed its relatively thin belly armor well above the level of the dike. While descending, it offered the enemy yet another effective shot, this time at its top armor. Clearly, he noted, the dikes not only slowed him, down, but made him a far better target, as well.

Seventeen years later, Colonel Beal has not forgotten the effect of those seemingly innocuous dirt berms on the maneuverability and vulnerability of his tanks. Now, as the commander of the First Brigade, Eighth Infantry Division (Mechanized) in USAREUR, he has taken the initiative to use this effect to the brigade's advantage. In response to recent significant improvements in Soviet armor capability, he directed his brigade engineer to explore the feasibility of using simple manmade emplacements to produce the same effects on tracked vehicle maneuverability as did the paddy dikes in Vietnam. His intent was to develop a linear, engineer-emplaced obstacle which would negate improvements in Soviet armor by causing enemy tanks to expose their most vulnerable areas — top and belly — to direct fire. It would be developed as an alternative to the tank ditch, since it would require the same engineer digging equipment to construct. In keeping with the simplicity of the concept, the proposed new obstacle was dubbed, simply, the "tank bump".

Though the concept of the tank bump is new, it reflects two well-established principles which are fundamental to the effective employment of obstacles in the defense. First, it reinforces the axiom that all obstacles must be covered by fire. It would be pointless to expose the vulnerable portions of an enemy tank if we did not expect to engage that tank with direct fire at that moment. Second, the concept recognizes that obstacles alone cannot stop a determined attack; rather, they support the defense by delaying and disrupting the attacker as he is being engaged, so that he can be engaged more effectively

Two bulldozers working together to cut a tank bump obstacle. One cuts the V-shaped ditch while the other builds the berm.

How To Do It:

* Process requires either two bulldozers or one bulldozer and a CEV or scoop loader.
* Bulldozer blade is set at appropriate angle to cut V-shaped ditch.
* Second bulldozer or other bladed vehicle works across ditch from shallow to deep side, striking off spoil and building berm on friendly side.

A bulldozer must be used to cut the ditch because its blade can be angled to create the V-shape needed.

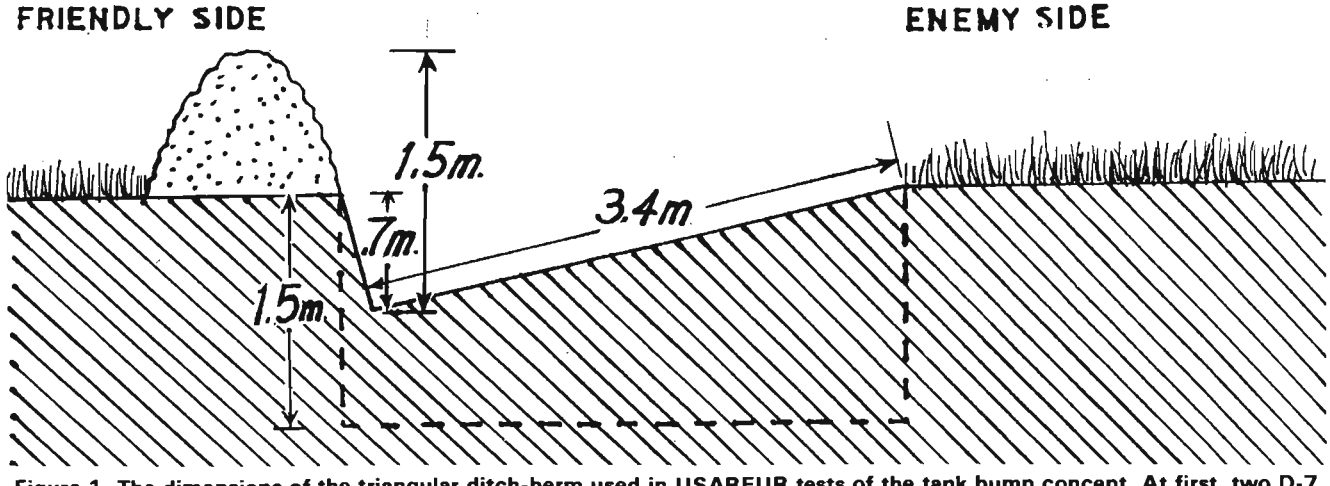


Figure 1. The dimensions of the triangular ditch-berm used in USAREUR tests of the tank bump concept. At first, two D-7 bulldozers were used, but further testing revealed that one could be replaced by a CEV or scoop loader.

and for a longer period of time. Tank bumps illustrate this point, because they are not intended to stop the enemy. In fact, they can be effectively employed only if they are crossed. Thus, although tank bumps represent a significant departure from normal obstacle types, they are totally conventional in their employment.

The criteria established for the development of tank bumps were simple:

- Tank bumps should be easily emplaced, using combat engineer equipment currently available in the division.
- Their rate of emplacement should be significantly faster than that of standard tank ditches of rectangular cross-section.
- When traversed, tank bumps should cause an enemy tank to expose its belly or top armor long enough for a friendly gunner to aim and fire his weapon accurately at the exposed area.
- Tank bumps should not present such an imposing obstacle that they cause the enemy to attempt to breach or seek bypass. They must be traversed to be effective.

Using these criteria as a basis, the Brigade Engineer Section conducted a series of experiments on the construction and effectiveness of tank bumps on 9 and 10 September 1985, at the brigade's local training area (LTA) in Mainz-Gonsenheim, Germany. The brigade's normally associated direct support engineer company from the divisional engineer battalion supported the tests with two D-7 bulldozers; 4th Battalion, 69th Armor provided an M60A3 for evaluation of the completed tank bumps. It should be noted that the initial tests were very limited in scope. The small size of the LTA and the homogeneity of its soil dictated limited objectives: to determine the optimum configuration of the tank bump, to calculate the rate of emplacement, to evaluate the effectiveness of tank bumps as they are traversed by a tank, and to determine the degree to which their effectiveness is degraded by subsequent passes through the same path.

Taking into account the tradeoff between an obstacle's effectiveness and its emplacement time, the Bri-

Extent of tank's vulnerability to a belly shot is apparent in this photo of test M60A3 climbing the berm. The advantage would increase if friendly forces were level with or below level of the berm.

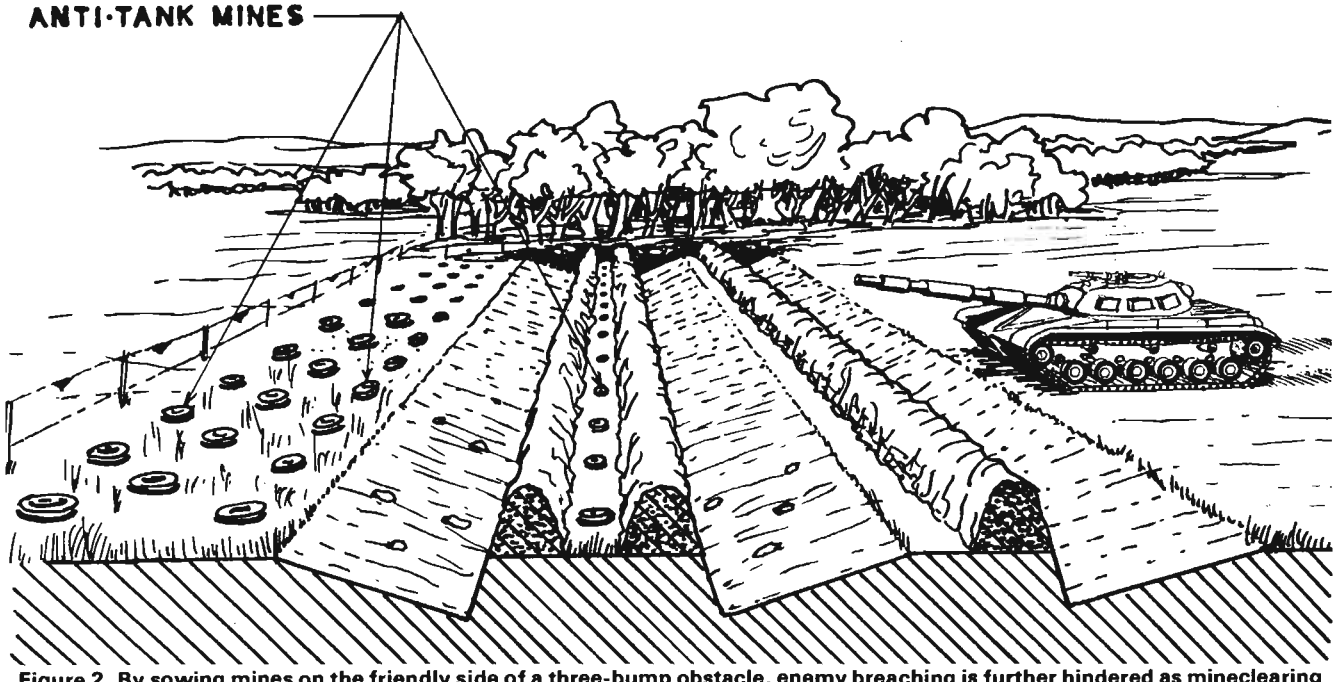


Figure 2. By sowing mines on the friendly side of a three-bump obstacle, enemy breaching is further hindered as mineclearing vehicles like rollers and plows would not be able to negotiate the bumps to deal with the mines. The bumps also render the attacker's main gun useless during his breach, and unlike tank ditches, the shallow bumps cannot be used by attackers for defilade protection.

Tank bump also exposes a tank's thinner top armor to killing shots as it descends the berm.

gade Engineer determined the optimum configuration to be the triangular ditch-berm arrangement shown in Figure 1. Two D-7s constructed the tank bumps, working as a team: one cutting the ditch with an angled blade, the other "striking off" the spoil and building the berm on the friendly side in the process. The rate of emplacement was approximately 250 meters per hour in relatively soft, sandy soil. A dozer must be used to cut the ditch because an angled blade is required to create the V-shape; however, a combat engineer vehicle or scoop loader could substitute for the second dozer with no significant decrease in efficiency. At this point, the designation of the friendly and enemy sides of the tank bump was, in fact, arbitrary. During evaluation tests, a tank would traverse the emplacement in both directions to determine the most effective orientation.

Evaluation of the effectiveness of the tank bumps consisted of four separate tests, all conducted with one M60A3 tank. First the tank crossed a single bump, moving from the enemy side to the friendly side (first through the ditch, then over the berm.) Then it crossed in the opposite direction. Third, it made multiple passes along the same path in both directions to determine how much the bumps are degraded by continued traffic. Finally, the tank traversed a "bump course" — a series of three parallel tank bumps.

The results of the tests were promising. When the M60A3 crossed a tank bump from the enemy side to the friendly side, it exposed its belly very effectively as it climbed the berm. Even though only a portion of the belly projected above the top edge of the berm, it is important to note that the berm itself would not stop (or even slow down) a sabot round. In effect, the portion of the tank's belly which was hidden by the berm was still exposed to direct fire. The tank's top was not as effectively exposed, however, since the tank could descend the friendly side of the berm much more quickly than it could climb the enemy side.

When crossing in the opposite direction, the tank exposed its belly almost as effectively as it had in the first test. Unlike the first test, though, it also exposed its top armor for a significant period of time — 5 to 10 seconds. As the tank descended the berm, no matter how slowly it moved, its lower frontal armor dug into the bottom of the ditch, and the vehicle had to plow its way out of the ditch in order to continue moving forward. On the average, it took 10 to 15 seconds to traverse a single tank bump in either direction. The tank commander noted that he could not have crossed the bumps any faster without damaging the tank's suspension system. He added that he could not possibly have employed his main gun at any time while crossing.

Subsequent tests indicated that the effectiveness of tank bumps was not degraded by consecutive passes through the same path. On the first pass, the tank tended to compact the berm, making it just as effective on the next pass.

Employing three parallel tank bumps in depth significantly improved the effectiveness of the obstacle. The first bump in the series reduced the tank's momentum, thus making it more difficult to traverse each subsequent bump.

Upon completion of testing, an analysis of the results and a detailed debriefing with the tank crew of the test vehicle yielded a number of conclusions:

- Most importantly, the relatively short period of time it takes a tank to traverse a tank bump dictates that this obstacle cannot be effectively covered by TOW or Dragon missiles. Because of their lengthy time of flight, wire-guided missiles could not engage enemy tanks during the brief period when their bellies or tops are exposed. Clearly, tank bumps must be used in support of tanks.
- Tank bumps oriented so that an enemy tank must cross first the berm, then the ditch, appear to be most effective in exposing both the tank's belly and top; however, tank bumps oriented in this direction are also the most easily breached. An enemy engineer vehicle or blade tank could simply plow the loose earth berm into the ditch to create a lane. If the orientation is reversed, breaching is considerably more difficult.
- Because tank bumps are intended to be an alternative to tank ditches, it is useful to compare certain aspects of the obstacles. Note that tank bumps are significantly

shallower (see Figure 1). As a result, their emplacement rate is three to four times faster. Because a tank bump's ditch is less than one meter deep, it would be especially useful in an area where tank ditching is impossible, due to the proximity of bedrock to the surface. (Bedrock less than one meter from the surface is a common condition in West Germany.) Unlike tank ditches, tank bumps are not nearly deep enough to be used as expedient fighting positions by an advancing enemy.

Based on these conclusions, the brigade has developed a recommended configuration for a tank bump course which takes best advantage of the favorable characteristics of this obstacle (Figure 2). The course can be emplaced with the same amount of engineer equipment hours as a standard rectangular tank ditch of the same length. It is designed to achieve the following effects:

- An enemy tank crosses the first two bumps, exposing his belly twice to friendly fire. In this orientation, the bumps are easier to traverse than to breach, so he would most likely attempt to cross, rather than bring his engineers forward.
- The third bump is reversed, so he exposes both his belly and top as he crosses. While the tank bump in this orientation is more easily breached, the enemy tank is already exposed to direct fire with tank bumps to his front and rear. Breaching equipment would have to cross the first two bumps before it could reach the third.
- As the enemy encounters the third tank bump, he also encounters the leading edge of an antitank minefield. The first two bumps disguised the presence of the mines, so he probably was not aware of their existence until he encountered the first one. Now, even if he crosses the third tank bump without being hit by direct fire, he must still breach a minefield. His primary means of minefield breaching — tank mounted rollers and plows — would find it extremely difficult, if not impossible, to move across the three tank bumps to reach the minefield.
- During the entire period it has taken to cross the obstacle, the enemy has been unable to fire his main gun.

Tank bumps cannot provide defilade for attackers, as tank ditches sometimes can. Loose soil is easily penetrated by modern APFSDS rounds and offers little protection to hull.

While tank bumps have shown a good deal of promise, it would be hasty to fully embrace the concept based solely on the testing done to date. Those tests, though they fully accomplished the established objectives, were not without several severe limitations:

- Initial tests were done in relatively soft soil. Emplacement times in different soil types may be somewhat slower.
- The concept demands that friendly tank crews are able to acquire and engage their targets with pinpoint accuracy during a very short span of time. The tests did not address the feasibility of such engagements under battlefield conditions.
- The tests were conducted on ground which was essentially level. Yet it is reasonable to expect that effective employment of tank bumps will be heavily dependent on the height of the friendly battle position and the slope of the kill zone on which the bumps are emplaced. If the battle position is significantly higher than the kill zone or if the kill zone is on the forward slope of a hill, "top shots" will be greatly enhanced, but it may be difficult, if not impossible, to create a "belly-shot".

Nonetheless, the initial tests have convinced Colonel Beale that tank bumps do, in fact, have the potential to accomplish their desired objective of exploiting the vulnerabilies of Soviet tank armor. That potential can only be realized through further testing — during tactical maneuver, in different types of soil, on irregular terrain, during periods of limited visibility. In the months ahead, the First Brigade will continue to test, develop and refine the concept, and will ultimately make tank bumps a viable part of its General Defense Plan.

CAPTAIN STEPHEN J. RESSLER is assigned to HQ, 8th Infantry Division, FRG, as brigade engineer. His CO, Colonel Thomas L. Beale, developed the concept while observing armor difficulties traversing drainage ditches in Vietnam and assigned Captain Ressler to investigate the usefulness of the technique as a tank obstacle in USAREUR.

Lessons Learned At the National Training Center:

An Observer-Controller's Perspective

by Major Beaufort C. Hallman, Jr.

Operation TORCH, the code name for the Allied invasion of North Africa in November 1942, marked the U.S. Army's first offensive operation in WWII. As TORCH unfolded, U.S. and British forces gained strategic surprise with landings in North Africa and moved east into Tunisia to defeat the famed German Afrika Korps. Initial U.S. Army tactical operations, however, met disaster as elements of the U.S. II Corps were defeated and forced to withdraw through the Kasserine Pass.[1]

The Army published a report defining the lessons learned during the Tunisian Campaign. The analysis determined that, although there were many challenges to effective training as the Army prepared for WWII, the basic principles outlined in contemporary training literature were sound. Most tactical failures, it pointed out, occurred as a result of inappropriate application of those basic principles.[2]

Unlike the U.S. Army of the early 1940s, the Army today is learning how to apply those basic principles while undergoing the most realistic combat training outside of combat itself.[3] The Army's National Training Center (NTC), located at Fort Irwin, California, provides our heavy forces with the opportunity to prepare to win the first battle of the next war. Using sophisticated computer instrumentation and the Multiple Integrated Laser Engagement System (MILES), units are able to sift through the "fog of war" and enhance their learning of critical combat skills.

Training at the NTC includes 14 days of field training in which a maneuver brigade, organized into two battalion task forces (TF), is matched against a totally professional opposing force (OPFOR) representing a Soviet motorized rifle regiment. During force-on-force operations, the OPFOR actions and MILES equipment produce realistic combat stress levels. These stress levels are heightened as task forces fight a regiment of computer-controlled targets in live-fire operations.[4] [5]

Throughout the NTC training, realism pervades the battlefield and continuous operations are the rule. OPFOR patrols can penetrate at any time whether on the offensive or the defensive. The OPFOR regiment in the attack advances at the rate of one kilometer every three minutes. OPFOR defensive obstacles and fire attacks are devastating and OPFOR jammers disrupt command and control nets at critical times during all operations. Smoke generators simulate artil-

lery-delivered obscuration, and airburst simulators replicate overhead artillery fires. CS (tear gas) grenades represent chemical contamination; training M-256 kits give appropriate chemical agent colors, and specially modified IM 174s give nuclear contamination readings. Hand grenade simulators replicate air attacks. MILES equipment simulates direct fire, including near misses and kills. Controllers assess the casualties from air strikes, artillery, mines, NBC, and field fortifications that can stop the MILES laser, but would show impact effects from real ammunition. Battle-damaged equipment hs to be reported, evacated, fixed, and returned to the owner. Casualties must be reported, treated, and evacuated to the aid station. Ammunition, fuel, and food must be delivered to the user.[6]

Throughout the planning, preparation, and execution of all operations, observer controllers (OC) record observations and training analysts signal the computer to record key battle sequences and radio transmissions for inclusion in after action reviews (AAR) and also for unit take-home packages. After action reviews (AARs) follow each tactical mission and are conducted at platoon, company, and task force level. The after action review is a chronological review of the most significant observations, which can be used to improve unit performance.[7] For those units that have experienced combat at the NTC, the battlefield realism and comprehensive feedback in the after action reviews have produced a steep learning curve in critical combat skills.[8] [9] As an observer controller for three years, I coordinated production of 250 task force level after action reviews. Those reviews are based on an analysis of the seven operating systems identified in FM 71-2 and later FM 71-2J. The seven systems are intelligence, maneuver, fire support, air defense, mobility/countermobility/survivability, combat service support, and command and control. The purpose of this article is to share some significant lessons learned that I observed while assigned to the NTC. I will use those seven systems as a framework for pointing out the techniques that were especially effective and characterized the well-trained battalion task force.

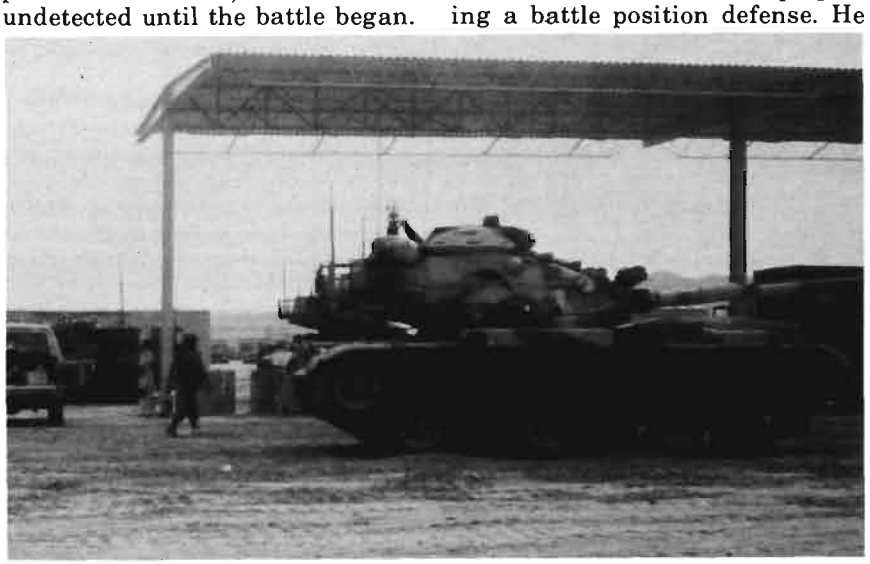
"The purpose of this article is to share some significant lessons learned that I observed while assigned to the NTC..."

Intelligence. The first system an observer controller uses to analyze unit performance is intelligence. A smooth-functioning intelligence system allows commanders to see the battlefield.[10] To be useful, both friendly and enemy information gathered before the battle must be provided to the key leaders of the task force. One technique used by the OPFOR commanders eliminates the problems of transmitting information by radio. Several hours before commencing an attack, the OPFOR gathers leaders for an intelligence update briefing. This allows their intelligence officer (S2) to provide the latest information, lets the commander confirm or adjust his scheme of maneuver, and aids coordination while maintaining radio silence.

Denying information to the enemy is equally important. During one defense mission, OPFOR reconnaissance forces penetrated an armor task force sector. The TF scout platoon had the mission of screening the TF front, but spent 8 hours recovering from the previous battle. During this delay, the OPFOR established observation posts, reported information, and remained undetected until the battle began. AAR discussions showed a tank or mechanized infantry unit could easily have established the initial security force. Had there been a change of mission, the result of that battle would have been in favor of the friendly forces.

Maneuver. The second system used to analyze a battle is maneuver. Using the task force's combat elements, the maneuver system destroys the enemy or takes terrain.[11] Armor units must provide their own security when infantry support is not available. For example, during an attack in which a tank company was extremely successful in restricted terrain, the company OC observed the following technique. As a tank stopped in defilade, the loader dismounted, moved to a vantage point, searched for targets, and used arm signals to direct the fire of the crew. This technique allowed the company to fight through the restricted terrain.

Another concern of the task force (TF) is the integration of obstacles and fires to destroy the enemy. Leaders should develop methods to check this integration. I observed the following method used by an armored TF commander in preparing a battle position defense. He



Prior to starting each rotation, observer controllers and civilian technicians conduct instrumentation checks. The NTC instrumentation allows for instant replays of training battles during after-action reviews.

Troops breaching obstacles in the open desert are extremely vulnerable to both direct and indirect fire. Author suggests breaching at night and urges assignment of engineers on reconnaissance patrols.

checked each platoon position, and on a map posted with the TF graphics, he added obstacles, platoon locations, platoon engagement areas, and the target reference points that each platoon could engage with direct fires. When compared with an overlay of the enemy avenues of approach, this variation of a TF fire plan allowed the commander to determine the number and type of weapons covering each avenue of approach and the TF obstacles. It also identified dead space and allowed him to adjust his defense plan to cover those areas. The result of this technique was a decisive victory over the OPFOR when they attacked the friendly defensive position.

Fire Support. The third system used to analyze results on the battlefield is fire support. The fire support system integrates available fires to support the maneuver system.[12] To ensure synchronization, the fire support concept must be understood by key leaders of the TF. The fire support officer (FSO) usually briefs the fire support plan when the TF issues an operations order. In order to ensure, however, that the commander's intent is conveyed, one proven technique is to have the task force commander brief his scheme of fire support just as he does his scheme of maneuver. Having the commander personally outline responsibilities and the timing of planned fires allows the staff and subordinate leaders to gain a better understanding of the commander's intent.

Even with a clearly defined concept, execution of fires still can be difficult because of the required accuracy in map reading. During defensive preparations, one successful artillery battalion commander used the artillery Position Azimuth Determining System (PADS) to verify the location of target reference points (TRPs), obstacles, and maneuver unit positions. Consequently, both fire support and maneuver leaders had accurate points of departure to execute artillery fires. The results were devastating in the application of indirect fire support.

Air Defense. Air defense is the fourth system used to assess battlefield performance at the NTC. The air defense system incorporates support from attached air defense units in conjunction with active and passive air defense measures.[13]

Early warning is a critical aspect of air defense. Normally, air defense early warning is relayed to the task force by attached Vulcan and Redeye or Stinger units, which monitor the division early warning radio net. Without attached support, air defense early warning may be relayed from the brigade headquarters over the brigade command net. This procedure is identified in FM 71-2J.

Maneuver units must refine their techniques to ensure they are clearly understood by operational personnel at brigade and TF level. During on exercise, a tank TF fought three battles before it was able to establish procedures to ensure air defense early warning flowed from the brigade down to company/team (Co/Tm) level.

Obviously, air defense early warning can facilitate engagement of enemy aircraft. Survivability, however, of Redeye or Stinger teams constrains the use of them forward in the TF sector because their wheeled vehicles are vulnerable to enemy fires. Many successful battalions have used an organizational technique to solve the survivability problem.

When in direct support of a Co/Tm, the Redeye or Stinger team separates. The gunner is placed in a Co/Tm armored vehicle, and the team leader remains with the Co/Tm combat trains. This organization provides armored protection for the gunner who is forward and increases air defense coverage with the team leader further to the rear at the combat trains. This technique requires practice because the missile gunner and armored vehicle crew have competing requirements during air attacks. The gunner needs to dismount and gain a vantage point to engage the aircraft, and the armored vehicle crew needs to seek defilade. Additionally, reporting procedures are necessary to ensure resupply of missiles to the gunner.

Mobility/Countermobility/Survivability. The fifth system used to analyze unit tactical operations is mobility/countermobility/survivability. The attached engineers provide the basis for the mobility/countermobility/survivability system.[14] One major concern is to maintain mobility. Breaching obstacles close to the enemy is dangerous, but darkness can provide concealment. For example, during one operation, a patrol was able to breach a wire and mine obstacles near an OPFOR position. The Co/Tm commander discussed the ac-

A typical OPFOR fighting position for a BMP is constructed in two tiers, allowing the vehicle to hide in turret defilade and fight from hull defilade.

tion in the AAR. The patrol attached lines to the wire and replaced it after completing the breach. On a prearranged pyrotechnic signal, the patrol used these lines to pull the wire open as the Co/Tm attacked the objective. Consequently, the friendly unit's mobility was not restricted by that enemy obstacle.

During defensive operations, friendly obstacles are emplaced to restrict enemy mobility, but the trick is to ensure they are covered by fire. This requires close coordination with the engineers or the troops who actually construct the obstacle. One technique reported by an armor Co/Tm OC addressed this problem. The sequence begins with placing weapon systems into position. Then a target vehicle is placed at the obstacle start point. Gunners sight on the vehicle to determine whether they can engage a target at the start point. If so, then a stake is driven in the ground. This procedure is repeated as the target vehicle moves along the entire obstacle trace. If the target vehicle cannot be engaged, the choice is to move the obstacle location or displace some weapon systems. The unit ultimately has a line marked by stakes which represent the position of the obstacle and ensures coverage by direct fire weapons.

Combat Service Support. The sixth operating system is combat service support. This system sustains the combat power of the TF.[15] Since the TF combat trains are vulnerable to indirect fires, successful task forces have achieved protection by echeloning their combat trains during the battle. Armor protection allows the track vehicles to be forward in the TF sector while operating the Admin/Log Center and aid station. Emergency ammunition, fuel, and wheel vehicles are further to the rear where they are less threatened by indirect fire. To be effective, procedures are necessary to communicate between the two elements.

Another consideration in supporting the TF is handling of casualties. Units cannot wait until after the fight to begin this process. One first sergeant did a superb job in casualty evacuation. He ensured the medics reconnoitered the routes to the aid station. As casualties occurred, platoon sergeants reported losses and ensured the wounded were moved to a company/team collection point. The first sergeant moved the medics to that point and gathered appropriate data to report to the combat trains. The medics treated the casualties and began immediate evacuation to the aid station. From the first sergeant's discussion of this technique during the TF Combat Service Support AAR, it was evident that he and his platoon sergeants had practiced the technique at their home station.

Command and Control. The last operating system, the command and control system, ties the other systems together by providing the process, organization, facilities, and communications necessary to make decisions, issue orders, and supervise operations.[16] It is vital to develop standard operating procedures (SOP) to ensure each staff officer provides timely information. After observing extremely effective command and staff actions by a mechanized infantry task force, an observer controller's discussions with the commander and operations officer (S3) revealed extensive home station training.

The TF commander and S3 reviewed AAR tapes of their previous NTC rotation to determine the information and coordination requirements of various offensive and defensive missions. To train the staff, an orders day was incorporated into the unit's weekly training sched-

The Seven Systems Tested at the NTC

* Intelligence
* Maneuver
* Fire Support
* Air Defense
* Mobility/Countermobility/Survivability
* Combat Service Support
* Command and Control

The most effective use of on-board smoke generation is during actual contact. Indiscriminate use of smoke can compromise a vehicle's position.

ule. Through repeated practice of command and staff actions, the TF was able to develop an SOP that satisfied the commanders information requirements and reduced the time required to generate operations orders.

The reproduction of orders and graphics often is a necessary irritant. The "old jelly roll" is not reliable. Reproducing by hand consumes time and increases quality control problems. One unit overcame these difficulties by using commercial equipment. An operator typed data from the staff into a microcomputer which was programmed with formats of the five-paragraph field order. The computer then produced the order. A master copy of the graphics overlay was produced by hand, and grid register marks were spaced on it to facilitate cutting the overlay into sections which would fit into a commercial copier. Then, using the copier, the operations order was reproduced on paper and the graphics overlay was copied on transparencies. Throughout the rotation, this technique produced quality, hard copy orders, and overlays.

Conclusion

Unlike the Army of 1942, we have a realistic combat environment in which to hone the skills of war. NTC training creates the stress of battle and provides timely feedback keyed to the issues which produce success or failure. Experience at the NTC provides a unique opportunity to learn the key tactics, techniques, or procedures necessary to build a cohesive fighting force.

Just as with the lessons learned in Tunisia, our doctrine is sound. Application of the basic principles offers many difficult challenges in training for combat. Tough opponents and high tempo battles often produce a very narrow margin of victory. Ultimately, our margin of strength in a rear war may well be the extent to which solutions become second nature to us.

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Bibliography

[1]U.S. Department of the Army, *American Military History, 1607-1958,* ROTCM 145-20. Washington D.C.: Government Printing Office, 17 July 1959, pp. 425-428.

[2]U.S. War Deparment, *Training Lessons from the Tunisian Campaign.,* Washington D.C.: War Department, 15 October 1942, p. 1.

[3]Nordeen, Lon O., "Training Realism — A Force Multiplier," *National Defense,* May-June 1984, pp. 71-74.

[4]*Combined Arms Monitor,* 2 April 1985, p. 3.

[5]Fetig, James, MAJ, USA, "Live Fire, Smoke, Mud: The Army's National Training Center Duplicates a Real Battlefield," *Defense Systems Review,* May 1984, pp. 22-25.

[6]*Rules of Engagement,* Fort Irwin, California, 2 May 1985.

[7]U.S. Army National Training Center, *Operations Group Organization and Functions Manual,* Fort Irwin, California, 18 September 1985.

[8]Fetig, p. 24.

[9]Richardson, William R., GEN, USA, "Top Leadership Qualities Have Roots in Schools," *ARMY,* October, 1985, p. 91.

[10]*The Tank and Mechanized Infantry Battalion Task Force,* FM 71-2J, Washington, D.C.: Headquarters Department of the Army, December 1984, pp. 2-13.

[11]Op. Cit., p. 1-34.

[12]Op. Cit., p. 7-5.

[13]Op. Cit., p. 1-35.

[14]Op. Cit., p. 1-35.

[15]Op. Cit., p. 8-1.

[16]Op. Cit., p. 2-7.

Radio Electronic Combat at the NTC

by Captain Michael T. Pierson

Truck-mounted XM-330 jammer and jeep-mounted direction finder, with azimuth indicator and receiver on rear fender, used by OPFOR at the NTC.

The Opposing Force (OPFOR) Electronic Warfare/Radio Electronic Combat (EW/REC) Detachment at the National Training Center (NTC) has the unique mission of simulating a Soviet REC unit in support of the OPFOR 32d Guards Motorized Rifle Regiment. The 40-member detachment provides communication intelligence (COMINT) monitoring, imitative communications deception (ICD), direction finding (DF), ground surveillance radar (GSR), and signal jamming support.

Jamming equipment used by the detachment includes two XM-330 electronic counter measures (ECM) systems. These systems are based on Soviet EW equipment and operate within the parameters of actual Soviet doctrine. Another simulation of Soviet equipment operated by the detachment is the XM-834 ground base air-to-air jammer. Each of these systems is on a 2½-ton truck and is powered by a 60KW generator. Either system is capable of jamming three frequencies at the same time with a maximum output of 1,500 watts.

In addition to the larger ECM systems, the detachment can also employ 2 AN/VLQ-4 "Piranha" VHF jammers on ¼-ton trucks. These systems can jam from 20 to 76 MHz with a maximum possible output of 300 watts. An advantage of this system is the capability to jam on the move.

The detachment also uses thirteen VRC 46/47 radios for intercept and for gathering communications intelligence. These have proven particularly effective since they are the same radios most training units use for communication at the NTC.

Within the vast area of the desert, direction-finding equipment is most beneficial. The REC unit employs AN/GRR-8 direction-finding systems in support of the OPFOR. The detachment has devised a mounting system that allows the receiver and the azimuth indicator to be mounted side-by-side on the rear fender of the jeep. Hence, the DF team is more mobile, having only to set up the W5-9880 DF antenna upon reaching their desired operational location. The systems are normally deployed approximately 6,000 meters apart. The teams can effectively locate enemy transmissions to within one hundred meters and provide a six-digit map grid location.

The flat, open terrain in the desert enables GSR to be effective to its maximum range. Detecting movement of vehicles to 10,000 meters and personnel to 6,000 meters is possible with the AN/PPS-5. In addition, the GSR guides friendly patrols/raids into or out of enemy lines. The REC detachment can employ up to three systems at one time. BRDMs (visually-modified M880 trucks) transport these systems.

One point which has been noted as a result of REC at the NTC is that none of the communications sys tems or data transfer systems presently used by the tactical units in the field are invulnerable to deliberate interference. Examples of the systems which have been targeted are the TACFIRE digital system and the KY-57 (VINSON) voice encryption system. While it has not been possible to decrypt the digital traffic, it has been possible to disrupt the digital signals and force personnel to talk in the clear. Also, personnel using VINSON seem to develop a false sense of security, leading to extensive use of lengthy transmissions which permit OPFOR

direction-finding teams to locate their position accurately.

The majority of units rotating through the NTC do not practice communications security (COMSEC). This allows the REC unit's interceptors to monitor enemy frequencies and gain valuable intelligence. Key frequencies, such as the task force command, artillery, and the scout platoon can be identified and passed to the jammers. In instances which are becoming more common, rotational units have not used daily changing callsigns, but have relied on such things as Red 6, White 6, Black 6 to identify platoon leaders and the company/team commander. These callsigns make tracking and following such units from day to day a very easy process and allow non-friendly stations to enter the net and pass bogus information. A prime target for imitative communication deception (ICD) is the artillery net. Misdirecting fire and giving the impression that artillery is on the way have proven to be extremely successful ploys. This success is largely due to a lack of authentication and proper encoding and decoding of messages by "friendly" forces.

Recently a task force commander of a mechanized unit using a nonsecure radio transmitted the following message to his TOC: "Get the S3 and the other five main guys (Co/Tm commanders) to meet me on HHC push in 15 minutes for a final update." The OPFOR REC interceptors had already identified the enemy's HHC frequency, and this information was passed directly to the regimental commander. Simply by monitoring the VRC-46 radio on his vehicle, the commander of the 32d Guards MRR listened while the task force commander passed the follow information (Figure 1):

- The two Co/Tms forward, spread across the sector, were "thin." The TF Cmd instructed the Co/Tm Cmds not to become decisively engaged from the front, but allow the OPFOR to pass and engage them from the rear with their tanks.
- The majority of E Company TOWs were in place on Hill 899.
- The Co/Tm on Hill 910 was instructed to move back, on order, to their alternate position north of Hill 876. The TF Cmd was concerned that this move take place because he considered that the weakest point of the defense.
- The two Co/Tms to the rear were located south of Hill 876 and toward Hill 985.
- All obstacles (concertina wire and mines) were in place at the crossings.
- Chopper support would be coming from the rear of the sector (to the south).
- The scout platoon was located in the same place as the previous day and would supply intelligence on direction and location of the second echelon.
- The second task force, farther to the east, was still preparing defensive positions and could handle only small breakthroughs.

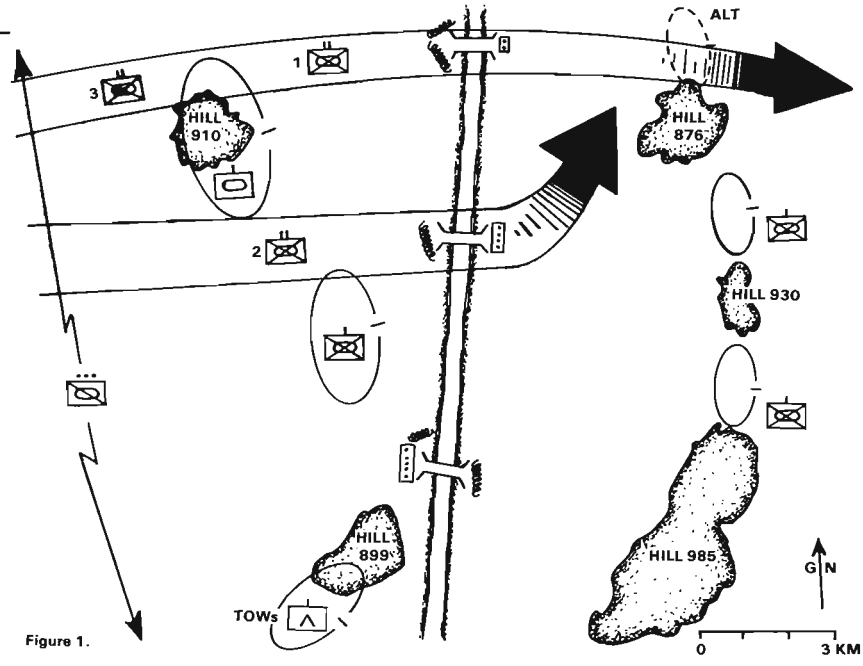


Figure 1.

The information and intelligence the commander of the regiment gained was as follows:

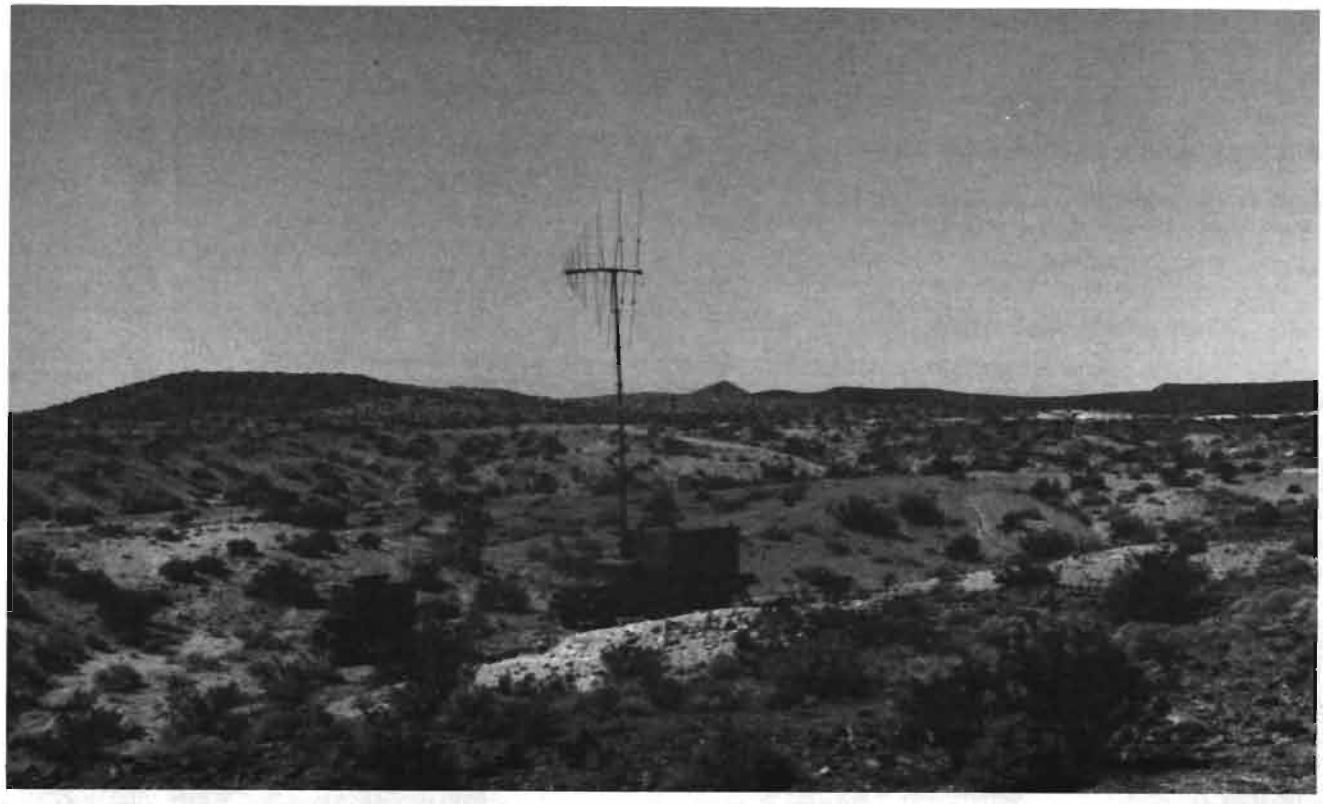
- The regiment was facing a mechanized task force with a second task force preparing positions in depth to the east.

defense and the TF Cmd had not had the time to get all his Co/Tm Cmds together for a final briefing at the TOC.

- Chopper support would be coming from the south.
- The mission of the scout platoon was to identify the second echelon.
- The task force commander believed his biggest weakness was North of Hill 876.
- The MRR Cmd now had in his possession the locations of all the following: the two forward Co/Tms


The jeep-mounted AN/VLQ-4 "Piranha" jammer, used by the OPFOR to interfere with 20-76 Mhz radio traffic.

"...With this much intelligence on the enemy, the outcome of the battle was never in doubt..."



The XM-330 can be used to jam three frequencies at the same time. Maximum output of the system is 1,500 watts.

and their mission — to engage from the rear; the two rear Co/Tms; E Company TOWs, and all obstacles in place, by type.

With this much intelligence on the enemy, the outcome of the battle was never in doubt. The regimental commander took advantage of the intelligence gained and changed his orders to ensure he attacked the enemy's weaknesses. The regiment attacked and overran the mechanized task force and had 80 percent of its combat power left when it engaged the second task force. Throughout the battle, the REC unit continued supporting the regiment by jamming the scout platoon frequency so no SPOT reports reached the task force commander on the location or direction of the approaching regiment; by jamming the artillery frequencies so that not a single round of artillery fell on the advancing regiment; and by jamming the command nets so that the task force commander was not able to effectly control his forces to maneuver against the approaching echelons.

This task force learned a valuable lesson the hard way. If it had set up proper radio procedure and if it had ensured encoding and decoding of messages and short radio transmissions, the task force commander's message would have never been intercepted. Additionally, the loss of command and control and artillery support could have been avoided if an alternate means of communciations had been established (such as different color star clusters to indicate phase lines or direction of movement).

For years, maneuver commanders have disregarded the importance of electronic warfare. At the NTC, the Electronic Warfare/Radio Electronic Warfare Detachment is reminding them that EW can be a major battlefield contributor.

CAPTAIN MICHAEL T. PIERSON served at the NTC as the commander of the OPFOR EW/REC, S2 of the OPFOR Motorized Rifle Regiment, and as scout platoon leader. He is a graduate of the Military Intelligence Basic Course, Imagery Interpretation Course, and the Military Intelligence Advanced Course. He received his BA from Carson-Newman College and his MA from East Tennessee State University and is presently the S2 of the 1st Battalion, 35th Armor, 1AD Germany.

3d Squadron: Training Today's Tank Commanders

New Fort Knox Unit Retrains TCs for New Assignments And Refreshes the Rusty

by Major Gerald S. Dalzell

In Korea, there are M48A5s. At Fort Bragg, there are M551 Sheridans. Some units have M60A3s, others M60A1s. We have the M1, the "improved product" IPM1s, and soon, the 120-mm-gunned M1A1s will be joining the force.

As a result, tank commanders rotating to new units often face the problem of learning an entirely different weapon system. And those soldiers who have served for a while away from TO&E units — for example, in recruiting, ROTC assignments, as Reserve advisors, and as drill sergeants — need to regain their technical and tactical skills before rejoining new units as tank commanders. Gaining units do not have the time or resources, the ranges and ammunition, to retrain these soldiers for their new assignments.

The Armor Force's newest squadron was formed to solve these problems. It is the 3d Squadron, 2d Armor Training Brigade at Fort Knox, and it has a dual mission: recertifying soldiers who have been reassigned from one model of tank to another; and retraining 19E/K NCOs and branch 12 officers who have been away from tanks for two or more years.

Originally, the Tank Commander's Certification course (TC^3) was established to fulfill this mission, and the 1st Armor Training Brigade became the lead unit to perform the task. But the chain of command soon realized that there was a conflict: 1st Brigade's major mission is to train AIT soldiers in Skill Level 10 while the TC^3 course focused on Skill Level 30/40 tasks. It was very difficult for the same unit to handle both major missions.

Soldiers assigned to 3d Squadron, 2d ATB, load ammo in preparation for range firing. The Fort Knox unit's main mission is reorienting soldiers who have been away from tanks.

Then a new idea took shape: establish a separate unit to instruct TC^3 and the Scout Commander Certification Course (SC^3). The Army Training and Doctrine Command approved the concept, and soon the 2d Armor Training Brigade (Armor Leader) formerly the Center/School Brigade, had a new squadron.

Equipment and personnel came from the 1st Brigade and other Fort Knox units to the newly established 3d Squadron, which was to instruct the TC^3, the SC^3, and M3 CFV transition course, and the first week of the pre-command course. As a result, all Armor leader courses at Skill Level 3 and above were consolidated under the control of the 2d Armor Training Brigade (Armor Leader).

The 3d Squadron was activated on 29 August 1985 with only a commander, executive officer, command sergeant major, and an S3 NCOIC assigned — the Squadron even had to "borrow" personnel to fill out the staff and color guard for its activation ceremony. Now, it has over 300 soldiers and civilians. The squadron also had no equipment at its activation; there was one M151 on loan from the 2/6 Cav. Today, it has over 100 vehicles, including IPM1s, M60A3s, M60A1s, M113A1s, M901s, and M3s. In support, its tactical fleet includes M151s, M35A2s, CUCVs, HEMMTs, and M88s.

The Squadron is organized with an HHT, two line companies, and two line troops. A and B Companies are responsible for instructing the TC^3, and C Troop has responsibility for SC^3. D Troop has administrative control, to include housing Advanced Noncommissioned Officer Course (ANCOC) and Master Gun-

ner (MG) students. The squadron is organized internally as a J-Series unit, with a consolidated squadron maintenance organization, contact teams to the companies/troops, a personnel action center (today, 1st Battalion's PAC provides this service), a consolidated supply action center and a support platoon. In addition to the normal responsibilities of an HHT, 3d Squadron HHT is responsible for over 40 combat vehicles that support other Armor School courses.

The squadron has myriad responsibilities, including the welfare of all students, instruction to students in the TC³ and SC³ courses, maintenance of equipment, and participation in and discussion of changes in tactics and gunnery doctrine as they affect the TC³ and SC³.

The TC³ was established for sergeants through command sergeant majors and second lieutenants through colonels, who have been away from tanks two or more years and are being reassigned to a tank unit. The course is designed around the Tank Commander Gunnery Skills Test (TCGST) for each specific tank, (i.e., M60A1, M60A3, M1 and soon the M1A1). An additional skill indicator (ASI) is awarded to the student for the vehicle on which he was trained. After a student graduates from TC³, his gaining unit receives a competent tank commander, able to command and control the tank to which he is assigned. This relieves the unit of the responsibility of having to train newly-arrived tank commanders on the gaining unit's equipment.

Although the course revolves around the TCGST, other pertinent subjects, such as conduct of fire, armament accuracy checks, and tactical tables, are covered. The Unit Conduct-of-Fire Trainer (U-COFT), a video display simulator, is used to augment conduct-of-fire training. An intermediate gunnery table is fired, consisting of tasks from the appropriate FM 17-12 for each weapons system.

The concept of instruction for the TC³ is radically different from other courses taught at the Armor School. A formal student chain of command is established to assist the unit with ensuring that all student administrative needs are met.

Students are formed into three- or four-man tank crews and are assigned to a tank of an instructor. Whenever instruction is tank-oriented, the crew will receive the instruction from the same instructor on "their tank." They keep the same instructor and vehicle for the duration of the course.

This linking of instructor, tank, and crew has resulted in an exciting training atmosphere. First, the students and instructor get to know one another, then build upon this rapport to establish a close working relationship. The instructor can see the student's weak areas, if any, and give additional instruction as required. Conversely, the students are less inhibited in asking for additional help.

Since the students are assigned as crews to specific tanks, they become responsible for the maintenance of their tanks. This close relationship between the students, instructor, and tank provides great benefit to both the students and the unit. Because the students perform all preventive checks and services under the guidance of their instructor, meticulous maintenance habits are relearned. To date, no crew has had to employ a tank in a degraded condition unless the classroom lesson specifically calls for degraded operation.

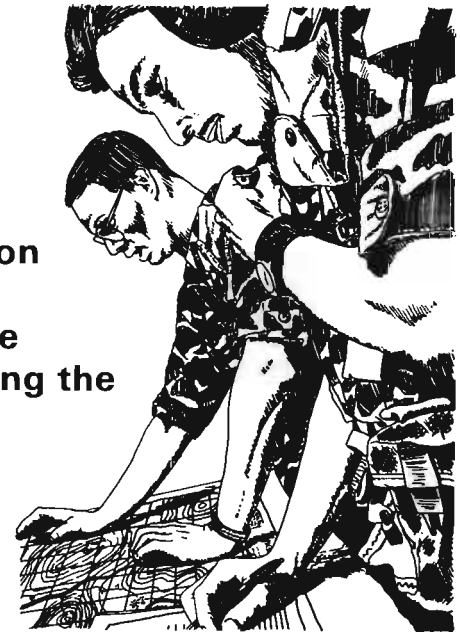
The idea of having a *single* unit responsible for the welfare and instruction of the student, as well as the maintenance of equipment and the organization of training areas and ranges, has resulted in untold benefits to both the students of TC³ and to the squadron. But most importantly, this concept is providing competent, well-trained armor and armored cavalry leaders to our force.

MAJOR GERALD S. DALZELL holds a BA from Massachusetts Maritime Academy and an MA from American Technical University. Commissioned through OCS, he has served in Armor and Engineer units at Fort Hood, Fort Knox, and the FRG, and has been assigned as platoon leader, company and squadron executive officer, battalion maintenance officer, Armor company commander, brigade S4 and battalion S3. At Fort Knox, he served in the Gunnery Branch, Weapons Department. This article was written when he served as XO of the 3d Squadron, 2d Armor Training Brigade. A graduate of AOB, AOAC, and CAS³, he is currently the S3 of the 498th Support Battalion, 2d AD, in the FRG.

Find the Second Echelon!

by Lieutenant Colonel William L. Howard

"The most common incorrect decision commanders make involves committing the reserve..."



Introduction

Equipment, tactics, and training are among the key aspects of success in battle. A corollary to this is the ability to find the enemy, determine what he is doing and then take appropriate action. This is a team effort, involving the scout platoons, the brigade intelligence systems, and the battalion and brigade operational planners. In the end, all affect the commander's decision.

In consideration of a potential adversary's mobility and his reported doctrine of rapidly-moving armored forces, the intelligence effort must be concerned not only with what is directly in front of the FEBA but where the enemy's reinforcements are and their direction of movement. The intelligence effort must be concerned with finding the second echelon. A slow-moving infantry unit can take days to arrive at the front line, but an armored element can reach the front in hours.

The battalion and brigade intelligence officers (IO) must be concerned with both the enemy immediately in front and with those follow-on elements which may be 30 or 50 miles away. To successfully accomplish an analysis of the enemy, the IO must have both reports from the troops in contact with the enemy and reports from his reconnaissance elements. Information supplied from higher and deeper intelligence assets is also necessary. Once he has all this information plotted on his S2 work map, he is then in a position to analyze future developments and advise the operational planners and his commander.

If any aspect of his analysis is faulty, then the operational plan will be flawed and the commander may make an incorrect decision.

The most common incorrect decision commanders make involves committing the reserve. A premature decision to commit the reserve, based on faulty intelligence, can be disastrous. Locating and monitoring the enemy's second echelon force is of critical concern. Of more immediate concern, especially in peacetime, is how to train the battalion and brigade staffs to function as a team.

This article describes a training exercise conducted for a ranger infantry company whose mission was long-range reconnaissance in support of a corps G2 section. The methodology and equipment that was used can be scaled down to division-, brigade-, and battalion-size units.

Background

In early 1973, the U.S. Army selected several of its Reserve training divisions to form Maneuver Training Commands (MTCs). It was expected that these new commands would plan and conduct training tests (ATTs), map maneuvers, field-training exercises (FTXs), and command post exercises (CPXs) for the battalions and lower echelon Reserve Component units in the readiness regions to which the MTCs were assigned.

The 100th Division (Training), in Kentucky, formed one of the new MTCs in June 1973. Its organizational chart resembled a corps headquarters plus a unit called the Umpire Group.

By 1974, the unit was fully operational and by the end of the year had conducted two FTXs, four CPXs, eleven ATTs, and three map maneuvers. During 1974, too, plans were laid for a reorganization — the first of many. As a result, branch

material teams were set up to conduct the various exercises. (Subsequent reorganizations were based on the troop unit density of the Reserve Component units in the Region.) The final MTC configuration showed nineteen functional teams, with all of the Army's branches, except Military Intelligence, being represented.

The 100th MTC had conducted exercises for a variety of units at all levels. An exercise conducted for Company F, 425th Infantry (Ranger), for example, was the first of its type and was a corps-level intelligence problem. It has also conducted a series of exercises for a COSCOM rear area operations center and several subordinate units.

Because of the organizational structure of the National Guard, there was a ranger infantry company and numerous combat service support units assigned to a rear area operations center. While this was done for command and control purposes, each unit, upon mobilization, would go to a different command. The specific purpose of the exercise, for the ranger infantry company, was to show the troops their role in the intelligence cycle.

The entire series of exercises required a corps-level scenario. To expedite matters, the Army Command and General Staff College's *"Forward Deployed Force Scenario"* was adopted. The 425th Infantry company's mission required the unit to form patrols which would be air-dropped behind enemy lines, where they would conduct reconnaissance missions. Using coded messages and burst transmitters, these patrols would report what they had observed. These messages would be received by their company headquarters, who would then deliver the messages to the Corps G2.

The first major questions were: What were the patrols going to see, and how would they see it? The solution was to use various identification and recognition guides, plus commercially available models of Soviet equipment. Other problem areas were administrative in nature and in most cases were resolved prior to the start of the exercise.

During the exercise, the patrols were gathered at tables with a controller for each patrol. All the patrols were located in a large drill hall in the armory, while the company headquarters was set up in a separate office. In an adjacent office, the Corps G2 section was established. Because of personnel considerations, three officers (two intelligence officers and one infantry officer) and one NCO made up the entire corps headquarters. A corps situation map and an intelligence work map made up the corps headquarters.

By prior arrangement, a scenario was developed in which the opposing force was attacking on three major axes in the corps sector. The personnel manning the corps headquarters had to generate most of the raw information needed to support the scenario. The front-line trace was plotted, air photo missions were plotted and, based upon the order of battle of the opposing force, numerous units and activities were created on the intelligence work map.

Meanwhile, "behind enemy lines," patrol controllers were placing the various vehicle models and photographs out for the patrols to observe. Reports by the patrols were recorded on tape cartridges to be transmitted at the appointed time. Because of the short period allowed for this exercise, twelve hours of exercise time were compressed into four hours of real time. During the four hours, the different patrols submitted their reports. These were decoded at the company and delivered to the corps headquarters where they were plotted on the intelligence work map. The basic information on the work map was consolidated on the corps situation map. At a predetermined time, both maps were taken to the drill hall and the patrols were allowed to watch as a simulated briefing of the corps G2 was conducted, using the intelligence work map. Then a simulated briefing of the corps commander and his staff was conducted using the situation map.

Recommendations for action were proposed by the G3 and requests for additional information were levied on the G2. Once the briefing was concluded, all elements returned to their work areas. The next four hours saw the patrols relocated, a new front line trace, new air photo missions and the generation of other intelligence indicators. Four hours real time later, another briefing session was conducted. The exercise was conducted on Saturday and Sunday so there were a total of three complete briefing cycles, which in exercise time was almost two days.

At the conclusion of the exercise, the Maneuver Training Command team conducted a review of the exercise and its objectives. The patrol personnel gained a much better understanding of the intelligence process and their roles in the operation. The MTC personnel also learned a great deal about corps-level planning and operations. Lessons learned were incorporated in future exercises. The basic scenario was also used later for the Rear Area Operations Center exercise.

The use of the plastic models greatly enhanced the realism of what might have been considered a dull, map maneuver. This fact was transmitted to various Army commands and served to inspire the development of the current Soviet models now in use by the Army. While the exercise was designed to provide training to long-range reconnaissance patrols, it has excellent potential to provide training to intelligence analysts as well as other intelligence personnel. In addition, it has the potential to provide training to all personnel involved with AirLand Battle planning and the location of enemy second echelon units.

Application

This exercise, while done for a company-size unit in support of a corps intelligence section, can be scaled down for a battalion-size unit to provide training to the scout platoon and the battalion S2 and S3 sections. It also has the potential for use by a brigade to train all scout sections and brigade intelligence systems.

The minimum requirements are a large room with a large scale map for the main battle area; a separate area for each element of a scout platoon; a separate room, away from the main battle area, for each battalion S2/3 element, and another room for the brigade S2/3, or control element.

"Support requirements are minimal as organic communication equipment can be used..."

Prior planning must include a detailed OPFOR plan of attack along with appropriate intelligence indicators, to include air photos, spot reports and PW interrogations. The plan can afford to be rigid and inflexible since the purpose of the exercise is to train our forces in teamwork, not to demonstrate the prowess of the OPFOR commander!

In addition, once the OPFOR basic plan is completed, several terrain models should be constructed to represent areas on the map in which the recon elements might operate. Enemy situations and formations can be simulated using items from training aids and by using the 1/300 scale models used by wargamers.

Personnel requirements are minimal. There should be two controllers for each reconnaissance element, a controller for each S2/3 element, and an exercise director. One additional person would be required for the senior headquarters not actually involved in the exercise. Support requirements are minimal as organic communication equipment can be used. In the event that the exercise is conducted at brigade level, several field telephones should be used to link the brigade and division G2/G3 elements.

In conclusion, this article describes a method whereby a commander from battalion level upward can conduct his own training which will provide experience for the scout platoon sections, the S2 and S3 elements in a minimum time with limited space, equipment and support. It will provide more realism for the scout section personnel and improve their performance on SQT recognition testing. It will allow the commander to develop teamwork in his unit and to do so prior to the critical test of combat.

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Recognition Quiz Answers

1. **EE-9 CASCAVEL (Brazil).** Crew, 3; combat weight, 12 tons; maximum road speed, 100 km/hr; maximum road range, 750 km; armament, 1 x EC-90 90-mm main gun, 1 x 7.62-mm or .50 caliber AA machine gun; engine, 6-cylinder 212-hp diesel; armor protects against small arms up to .50 caliber.

2. **M106A1 107-MM MORTAR CARRIER (U.S.).** Crew, 6; combat weight, 11,966 kg (13 tons); maximum road speed, 67 km/hr (water, 5-8 km/hr); maximum road range, 483 km; armament, 1 x 12.7-mm machine gun, 1 x M30 mortar; engine, 6-cylinder 215-hp diesel.

3. **LAV PIRANHA (U.S.).** Crew, 3 + 6; combat weight, 12,882 kg (14 tons); maximum road speed, 100 km/hr; (water, 10.46 km/hr); maximum road range, 668 km; engine, 6-cylinder 275-hp diesel; armament, 1 x 25-mm M242 Chain gun, 1 x 7.62-mm coaxial machine gun, 1 x 12.7-mm AA machine gun (optional).

4. **M2 BRADLEY (U.S.).** Crew, 3 + 7; combat weight, 22,666 kg (24 tons); maximum road speed, 66 km/hr (water, 7.2 km/hr); maximum road range, 483 km; engine, 8-cylinder 500-hp diesel; armament, 1 x 25-mm Chain Gun, 1 x 7.62-mm coaxial machine gun, 2-tube TOW launcher.

5. **BMP (USSR).** Crew, 3 + 8; combat weight, 13,500 kg (14 tons); maximum road speed, 80 km/hr (water, 6-8 km/hr); maximum road range, 500 km; engine, 6-cylinder 300-hp diesel; armament, 1 x 73-mm main gun, 1 x 7.62-mm coaxial machine gun, one launcher rail for *Sagger* ATGW.

6. **T-62 MBT (USSR).** Crew, 4; combat weight, 40,000 kg (44 tons); maximum road speed, 50 km/hr; maximum road range with added tanks, 650 km; engine, 12-cylinder 580-hp diesel; armament, 1 x 155-mm main gun, 1 x 7.62-mm coaxial machine gun, 1 x 12.7-mm AA machine gun.

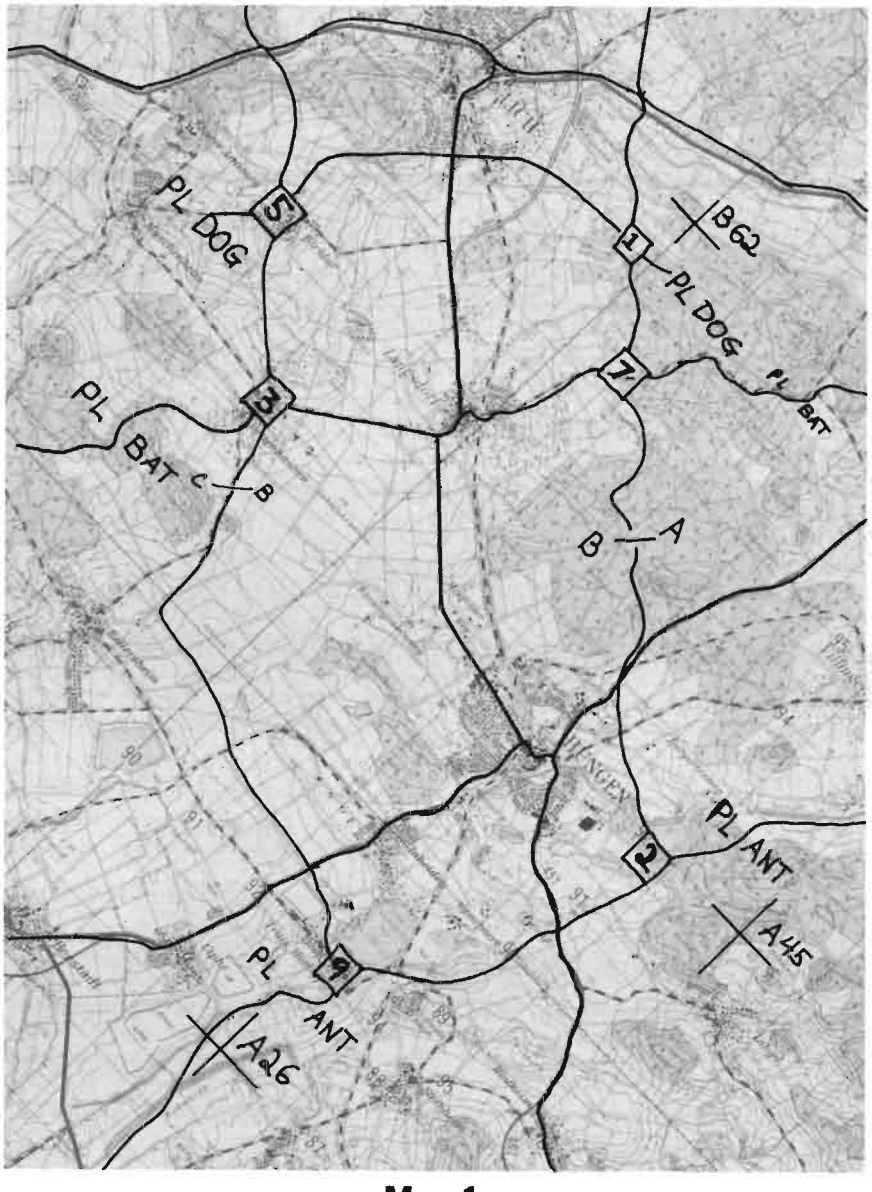
What Would You Do?
(First of Three Parts)

The Regimental Armored Cavalry Troop: Delay in Sector

Delay is a continuous series of defensive actions over successive positions in depth that trades the enemy space for time while retaining freedom of action. It is an economy-of-force operation that buys time to permit something else to happen at a more critical place on the battlefield. It is the toughest troop mission of them all.

The following critical tasks must be accomplished by the troop during the performance of a delay in sector:

- Maintain continual surveillance of high-speed routes or avenues of approach into troop sector 2-3 km forward of initial defensive positions.
- Destroy or repel all enemy divisional, regimental, and combat reconnaissance patrols forward of the troop's initial defensive positions.
- Establish engagement areas where the enemy can be canalized and exposed to concentrated direct fire along the most likely route or avenue of enemy approach through sector.
- Within engagement areas, employ obstacles to slow or stop the enemy's rate of advance and force his units to pile up on one another. Ensure *all* obstacles are covered by direct fire and protected from breaching attempts.
- Establish platoon battle positions along the base and flanks of each engagement area. Position them to concentrate direct fires within the engagement area.
- Suppress enemy units with indirect fires 3.5 km forward of initial defensive positions to slow down their rate of advance and disrupt tactical formations.
- Engage enemy tactical formations in one or both flanks before the units move from pre-battle to attack formation.
- Mass the available firepower of the troop within the engagement area.



Map 1

- Counterattack once the enemy shows signs of stopping, occupying hasty defensive positions, or withdrawing.
- Withdraw to subsequent battle positions if fires and maneuver do not stop the enemy formations as planned.
- Preserve freedom to maneuver. Avoid engagements which could pin forces down.
- Cause the enemy to deploy from march or pre-battle formation into attack formation successively as you move to the rear.

Situation

(Refer to Map 1)

You are the troop commander of Troop B, 1/208th Armored Cavalry Regiment (J-Series). At the squadron tactical operation center, you copy the following elements of the squadron operations order:

Troop B Task Organization:

Troop B
B/1/208
2/208 ENGR
TM2/1/2/208 MI (GSR)

Enemy Forces:

(1) The squadron should expect to see one or two motorized rifle regiments in its sector. Troop B should expect the advance guard reinforced motorized rifle battalion (MRB(+)) to attack into its sector along Rte 457 to secure crossings over the Wetter River at Lich. The MRB(+) is at 95 percent strength, equipped with BTR-70s and T-64s.

Friendly Forces:

(1) NLT ___ May 86, 208 ACR establishes a defensive covering force along PL ANT from ___ to ___ to destroy the first echelon regiments of the 2d CAA east of PL CAR.

(2) NLT ___ May 86, 230th Armored Brigade establishes defensive positions to the rear of 1/208 ACR from MB 870054 to MA 800900 to destroy a motorized rifle division.

(3) RAS (-) conducts screening operations forward of PL ANT.

(4) RAS (-) is regimental reserve.

Squadron Mission:

NLT ___ May 86, 1/208 ACR defends in sector from MA 870880 to MA 973964 to destroy an attacking first echelon regiment east of PL CAR. On order conduct battle handover and rearward passage of lines.

Execution:

a. Concept of the Operation.

(1) *Maneuver.* NLT ___ May 86, 1/208 ACR will defend in sector with three CAV troops abreast: Trp A in the north, B in the center, and C in the south, and the tank company in reserve. As the troops withdraw their scout platoons from their screen, they will defend/delay in three troop sectors to engage and destroy attacking reinforced MRBs. The northern troop will defend in sector forward of PL BAT. The center troop will delay in sector to draw a second echelon reinforced MRB deep into the squadron sector. The southern troop will defend in sector forward to PL BAT to separate the attacking MRBs. Upon commitment of this second echelon battalion, the northern troop will extend a screen to provide early warning for the squadron's northern flank. The tank company will then conduct a counterattack by fire to destroy the second echelon battalion. On order, the squadron will delay in sector to perform battle handover, rearward passage of lines, and movement to rear assembly areas.

b. Specific Instructions.

(1) Troop B:

(a) NLT ___ May 86 establish screen line positions from CP 2 (MA 948919) to CP 9 (MA 934885) along PL ANT.

(b) Delay in sector between PL ANT and PL DOG to form an enemy salient to support the counterattack by Company D against the second echelon battalion.

(c) Destroy the forward security element (FSE) forward of PL BAT.

(d) Destroy advanced guard forward of PL DOG.

(e) Defend in sector from PL DOG (CP 1, MA 897963 to CP 5, MA 869939) to complete the destruction of the threat battalions.

(f) On order coordinate battle handover at CP E, perform rearward passage of lines along RTE PAUL.

Problem No. 1

As the troop commander, and given this squadron operations order and overlay, how would you deploy your troop to accomplish the mission?

Solution

(Refer to Map 2)

To be successful, you should first study the terrain in your sector. Identify terrain along PL ANT, the initial squadron screen line, where observation posts will allow you to maintain continual surveillance of high speed routes or avenues of approach (Hwy 457), into the troop sector. This screen line should be 2-3 km forward of your initial defensive positions, thereby providing you ample early warning. One scout platoon should be adequate to screen this 4 km front, freeing the other scout platoon for the troop fight. You should assign 1st Platoon, (scouts) to occupy the screen with the mission to destroy or repel all divisional and regimental reconnaissance patrols forward of the troop's initial defensive positions. 1st Platoon should be given initial priority of indirect-fire support.

Establish engagement areas where the enemy can be canalized and exposed to concentrated direct fire along the most likely route (Hwy 457) or avenue of enemy approach through your sector. To have depth initially, try to establish the first engagement area 2-3 km behind the initial screen line. Your first engagement area should be on the west side of Hungen bounded by the wooded hills north and south of Hwy 457. A second engagement is planned for the pocket created by PL DOG.

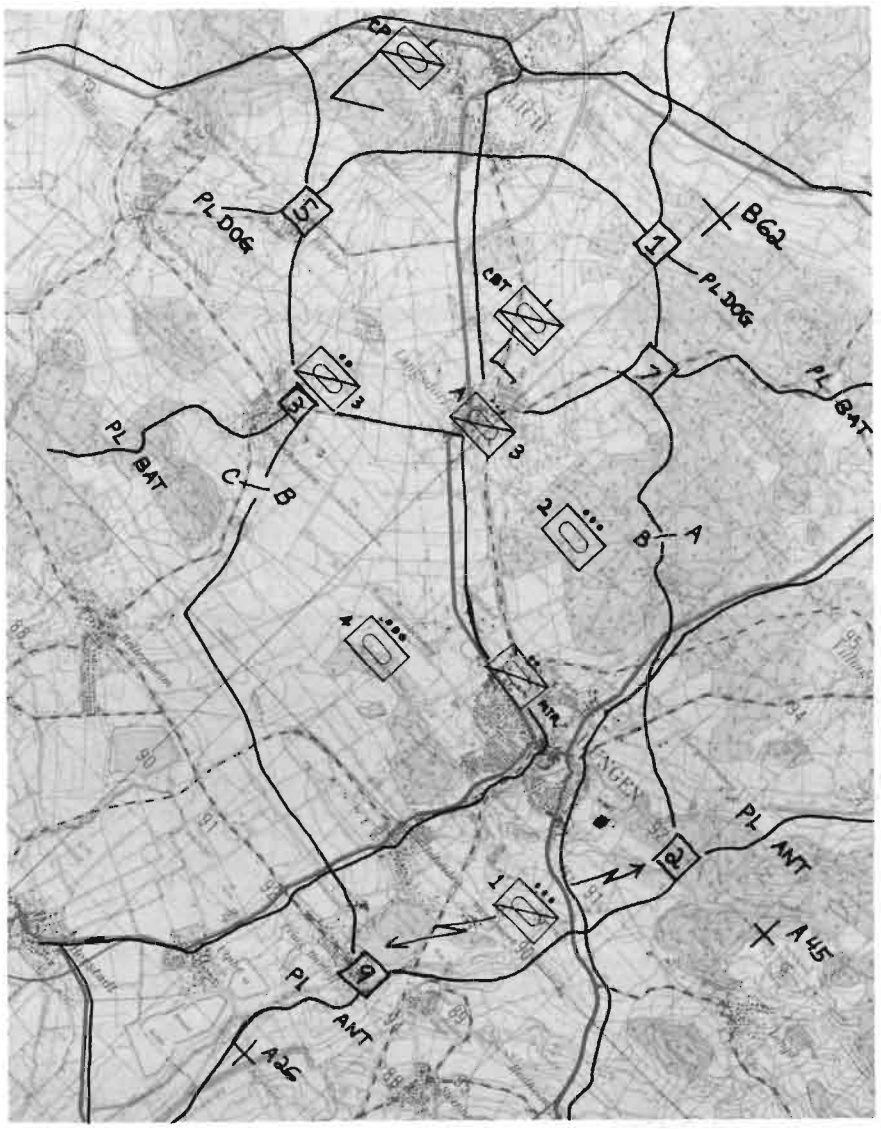
Your engagement areas should be supported by the effects of natural obstacles reinforced with other countermobility efforts provided by the 2/208 Engr Platoon attached to your troop. By employing such linear obstacles as minefields and antitank ditches, at an oblique to the enemy's direction of movement, you will slow or stop his rate of advance and force his units to pile up on each other. Ensure *all* your obstacles are covered by direct fire and protected from breaching attempts. Your obstacles must be located where you can mass the direct fires of all TOW and cannon systems of the troop.

Surrounding each engagement area in sector, establish platoon battle positions near its base and along one or both flanks. The idea is to create an L-shaped ambush on a large scale. Place your 3rd Platoon, (scouts) along PL BAT at the base of your L-shaped ambush. From PL BAT both TOW and chain guns can deliver effective fires from maximum standoff distance into the enemy formations within the initial engagement area. 3rd Platoon should split into two sections fighting out of the towns of Langsdorf and Bettenhausen on PL BAT.

Place your 2d and 4th Platoons

Map 2

"...The idea is to create an L-shaped ambush on a large scale..."



(the tanks) in battle positions where their cannon fires can be concentrated against enemy formations within the initial engagement area. Try to locate the tank platoons in areas which provide them space to hide, maneuver, and counterattack quickly into the engagement area. 2d Platoon should be positioned vicinity MA 915935, allowing them to hide until you call upon them to attack by fire south into your engagement area. 4th Platoon should be positioned vicinity MA 910910. From this hide position you can maneuver them to attack by fire north into the flanks of Hwy 457 in your primary engagement area. You also have an option with 4th Platoon to cover a supplemental avenue of approach to the south. If time permits, your attached engineer platoon should use their 2 ACEs to prepare defilade positions for the platoon's individual vehicles.

To control and achieve overlapping platoon fires, establish a series of easily identified target reference points and assign each platoon sectors of fire. Issue target engagement priorities. Have your FIST Chief develop a fire support plan that complements your scheme of maneuver. Make sure all your platoon leaders get a target list. Designate battle positions through your troop sector for platoons to occupy if the enemy forces you to abandon your initial defensive positions. Provide time for your platoon leaders to reconnoiter and find high-speed routes of withdrawal back to subsequent battle positions.

Your mortars will have to be initially positioned on the western edge of Hungen. This allows them to range 2-3 km forward of 1st platoon scouts occupying your screen line. Designate subsequent firing positions for the mortar section back through sector (i.e. Langsdorf and Lich).

Position the GSR team to augment the observation capabilities of your scouts.

Position the troop command post on the south side of Lich on terrain that affords good FM radio communications with troop elements and squadron headquarters. Designate subsequent command post sites back through sector as necessary.

Position your troop combat trains just behind the initial platoon battle positions. Hiding in the northwest corner of Langsdorf affords the trains good cover and concealment with good quick mobility to support the platoons. Designate subsequent locations for the trains back through sector.

As troop commander, position yourself well-forward to overwatch the initial engagement area. Your initial position may be with 4th Platoon to allow you to observe the activities of 1st Platoon on the screen. Your subsequent position will probably be in Langsdorf allowing you to see the battlefield and all your platoons. This gives you the ability to orchestrate the fight, control the platoon fires and time engagements to achieve maximum destruction of the enemy. Keep your FIST chief close by.

(The second of three parts will appear in the next issue of *ARMOR*. This article was prepared by CPT John L. Ballantine IV of the Cavalry Branch, Company/Team Division, Command and Staff Department, USAARMS.)

Terrain: Do We Use It Well?

Use of terrain is the tank commander's key to success on the modern battlefield. It is also, I feel, one of the least-trained skills in today's Army. While stationed at the National Training Center (NTC), I fought as part of the Opposing Force (OPFOR) Regiment and served as an observer controller in the Operations Group. This article is based on my experiences during my tour at the NTC.

As a member of the OPFOR, I destroyed a number of vehicles sited in poor fighting positions. As an observer controller, I witnessed the same. Moreover, in most of these cases, there was usually an excellent fighting position close by.

Task forces that used excessive survivability positions were the worst abusers of the terrain. They positioned their vehicle to fit the commander's concept, not to fit the terrain. This method does not work. Combat vehicles can never be positioned to fit a plan. All positions must be terrain-determined. Unless a leader tailors his plans to the terrain, he will lose combat power through the attrition of his poorly-positioned vehicles.

As a platoon leader and a motorized rifle company commander, I learned not to depend on external engineer support. Most of the support was provided from company assets. This situation forced me to devise a method to establish defences with few prepared fighting positions, forcing a greater reliance on proper terrain analysis.

During the leader's reconnaissance, I briefed my tank commanders on what the mission entailed and how I thought the battle would be fought. My tank commanders received a sector of responsibility and an area to defend from, and they would decide how best to defend that sector. During a brief-back, I incorporated each TC's position into the overall concept of the mission, so as to ensure mutual support for all vehicles.

Many benefits will accrue from this method. The responsibility of fighting a vehicle within a piece of terrain is fixed at the tank commander level. The tank commander better understands the terrain and how to maneuver and fight in it. A leader can tailor his operation order to the specific needs of each vehicle, making it more effective. The leader also receives a better understanding of how his tank commanders are planning to execute the mission, so command and control is easier for all concerned.

Another successful technique I used at the NTC was to assign specific patrol areas to tank commanders. The tank commander analyzed his patrol area to identify firing positions and internal movement routes. During the battle, he could move within his area and engage the enemy as he saw best. By controlling the size of each area, I could still distribute the firepower of my tanks.

This technique facilitates command over the battle area. There is a greater flexibility and more maneuverability in the defensive sector. The enhanced movement helps to confuse the opposing element as to the exact number and type of vehicles in the battle position. More firepower can be concentrated at one point for local superiority and greater shock effect.

Terrain is just as important in the offense. I have found that the critical terrain usually falls into two categories: terrain that is defended and terrain on an objective. Since the objective is usually defended, there is a corresponding engagement area to cross before securing it, and a unit pays the price of attrition to get there. Then the attacking unit must make the defenders pay the price for letting them get there.

I believe our Army has a chronic problem consolidating on the objective. In one case, as an observer controller, I witnessed a battalion task force reach an objective, only to be destroyed by a reverse slope defense. In another, an armor company team overran my position, but was destroyed by one hidden tank. These were not isolated incidents. They happened frequently at the NTC.

My first company commander taught me why the offense often dies on the objective. In order to consolidate an objective, you must determine the exact location of the defenders, decide how to use the terrain to close with them, and brief the crew on the actions they must take. Then, finally, you must move to the enemy and destroy him. This method takes a lot of practice and requires each tank commander to be flexible, analyzing the situation before attempting to consolidate.

Leaders cannot win this battle; only the soldiers and crews behind the weapons can.

Terrain is one of the most valuable resources a tank commander can be given. Proper use of the terrain is the key to his survival and to a successful operation. I believe it is imperative that leaders tailor the operation to the terrain and not try to mold the terrain to an operation. We must give each tank commander terrain that he can fight.

We must not repeat the historical lesson of the cavalry charge at Balaclava in the Crimean War. As Tennyson so aptly wrote in "The Charge of the Light Brigade:"

"Theirs was not to make reply,
Theirs was not to reason why,
Theirs but to do and die."

We cannot, in all good conscience, ask our soldiers to do the impossible. Without proper use of terrain, are we not asking them to "ride into the Valley of Death?"

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Preparing Our Support Elements For Combat

The AirLand Battle, as described in FM 90-14, "Rear Battle," will be fought deep, close-in, and in the rear." As commanders and staff officers during the next conflict, we'll be leading combat service support personnel into this rear battle. Will they be ready to support our maneuvers while protecting themselves? Have we been allowing limited resources to deprive mechanics, cooks, clerks, and truck drivers of the very training that will help them support and survive in a hostile environment?

Any armor leader who has led supporting soldiers at company or higher level understands the grave importance of these questions. Without combat-ready supply, administrative, and maintenance personnel, our tactical success is in jeopardy. But training these troops to be soldiers first and logisticians second is no easy task. The roles played by supporting elements in garrison continue when the unit deploys to the field. Every primary and special staff section handles garrison crises while concurrently providing complete support to moving, shooting, and communicating tankers. Shortages of ammunition, training devices (pyrotechnics, mines, and MILES gear, for example), and other assets, understandably force commanders to push support personnel to the rear of the training line.

To those who claim that support elements don't want tactical training, I reply that the opposite is true. As a battalion maintenance officer for nineteen months, I was bombarded with questions from ninety percent of my section: "Why have I never fired this M2?" or, "Why do we have to wear MILES harnesses if we can't fire back because we have no ammo?" Almost incredibly, most of my mechanics felt let down at the end of a major training exercise because the chemical attacks they had anticipated for months never took place. Few clerks, medics, or truck drivers joined the Army solely for educational benefits or technical training; the excitment of training in a combat environment probably was equally attractive. We've all read accounts of motivated cooks or mechanics who gallantly traded spatulas or screwdrivers for machine guns in the heat of battle. Supporting troops can fight as soldiers if trained properly with the available, limited resources.

How can we vault these obstacles to preparing our support elements for combat? The solution obviously calls for strong command emphasis at all levels. Command channels must be used to demand sufficient time and supplies to offer rear echelon soldiers the tactical training they need. As the pressure to improve the combat readiness of our trains travels up and down the chain of command, changes will occur.

One such change required to help armor leaders train supporting subordinates is training time allocation. Support and administrative commitments in garrison severely restrict the time most units have to train in the field. The leader who sees the need to train his support personnel must take advantage of open ranges and borrowed evaluators when they are available. After forewarning supported elements, he can rotate clerks, cooks, or armorers through a training cycle as individuals or groups and still satisfy the support demands. Allow sister sections to pick up the slack during these training sessions; the S1 section, for example, must be cross-trained to handle S4 functions in combat, so why not practice this in garrison? Preplanned cooperation between elements will provide the time to get our supporting soldiers out of the trains and into the turret.

Commanders who recognize the training needs of logistics and administrative personnel also must improve distribution of training aids to these supporting sections. Given a limited supply of these items, leaders of combat troops should take only what they need and turn in the excess. Binoculars, NBC alarms, and night vision devices, for example, can be hand-receipted from other units prior to deployment. Dummy mines can be made by TASC prior to the exercise. Too many resources remain untapped for supporting soldiers to be denied realistic combat training because of lack of equipment. Even the best simulator has its limitations as a training aid.

Although time and resource restrictions exist, armor leaders can improve the combat readiness of combat service support soldiers by ensuring that *all* downrange functions are conducted tactically. Too often the real world support mission becomes so vital that basic principles of OPSEC are overlooked. Dispersion, camouflage, and local security become last priority when engine-transmission packs must be pulled or simulated casualties evacuated. The absence of live artillery rounds and sniper fire can create the belief that trains personnel needn't bother with troublesome protective masks, or maintain light discipline, when support needs are heavy. But the battlefield is no place to learn that dead mechanics don't turn wrenches. Leaders must know what precautions must be taken to protect supporting soldiers. Yet security violations continue to plague the rear battle arena. Our mission is to aggressively enforce tough standards of tactical conduct in all areas of the battlefield.

Without administrative and logistical support, the success of any extended operation will be limited. Enemy doctrine calls for constant exposure of our rear support areas to infiltration and indirect fire. Support personnel unprepared to protect themselves will not survive in battle.

It's time to put appropriate command emphasis on eliminating this training dilemma via heightened use of all available resources, to include the expertise of our combat arms leaders.

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PROFESSIONAL THOUGHTS

Making a Case for Cavalry Battle Drill

Cavalrymen have always stressed the necessity of independent action in cavalry operations, but this first requires a solid grasp of small unit tactics. Platoon battle drill serves as a training tool to develop the tactical skills of leaders and their soldiers. Battle drill, if properly conducted, simplifies battlefield management for the platoon leader, nearly eliminates radio traffic, and greatly reduces reaction times in critical situations. It also enhances individual crew skills and develops tremendouus teamwork by increasing the confidence and involvement of all soldiers in platoon operations.

On the modern battlefield, a multitude of situations will require quick reactions coupled with clear, concise orders. Standardized drills cannot be expected to cover all possible situations, but at a minimum, they allow a platoon to rapidly mass fires or radically alter its direction of travel with little confusion. An integral part of battle drills are hand and arm signals and distinctive code words assigned to each type of maneuver. These allow the leader to convey orders simply and clearly, especially when radio traffic is impossible or greatly hampered. In these scenarios, simple orders with clearly defined meanings will minimize the effects of battlefield distractors and radio interference.

Platoon battle drill can also be tremendously effective in developing teamwork, esprit, and individual skills. Properly conducted battle drill requires the active participation of every soldier in the platoon. Even scout-observers will feel the importance of their roles.

The need for battle drill will be obvious early on, when hand and arm signals are missed or mistaken, and vehicles stray out of formation. Then as the confusion of the early stages evolves into quick resolute action, pride and confidence in the platoon and its leadership will grow from the knowledge that every man knows his duties and the platoon as a whole has learned to act decisively in any situation. Most importantly, soldiers learn that any operation that is carried out with energy and decision will generally be successful.

My own experiences with cavalry battle drill were as a platoon leader and a platoon trainer/evaluator. In the fall of 1983, the 11th Armored Cavalry Regiment implemented platoon battle drill training at Hohenfels Training Area, Germany. The instruction was developed as a follow-on to M1 New Equipment Training. The purpose was to standardize operations within the regiment and to train platoons in tactics designed to exploit the advantages of the M1 tank despite the constraint of operating with M113- and M901-equipped scouts. Even though all training was organized by regiment, the emphasis was on platoon leaders as primary trainers. The training was designed to be progressive and the extensive use of practice exercises developed familiarity with the maneuvers prior to full scale drills.

The first step of training should be developing a familiarity with all the drills and their associated commands. These drills should be as close to standard army battle drill as possible. This simplifies development and makes the training applicable in more situations. Noncommissioned officers must train these drills as individual skills, so every man can recognize the various formations and commands when he participates in collective platoon training.

The collective portion of the training should begin with extensive chalkboard and sandtable exercises. In these sessions, it is important to teach when to use the different drills and why the are used. Emphasis must be placed on the advantages and disadvantages of each drill. This is also the time to establish the role of each individual in the platoon and to stress his importance to the operation. Walk through the drills and require every soldier to actively participate, explaining his role at various points in the operation. Just as with a football team practicing for a game, successful training means every man has learned his part on the overall platoon mission. Once this level has been achieved, simulate leadership casualties and then require subordinates to make the decisions. This heightens their interest in the training and shows them some of the difficulties of decision making.

Before moving to mounted exercises, make preparations to obtain a proper training site, trained evaluators, and some form of OPFOR. Think out every aspect of the operation to make efficient use of limited training time.

Proper site selection and layout of a training course are very important and adequate maneuver space is a necessity. A circular course makes efficient use of time because there is not need to stop training. The completion of one cycle has the platoon in position to start its next run, allowing maximum use of valuable training time. A convenient site should also be set up for conducting after-action reviews. And finally, spare no effort in creating realism to ensure the soldiers take a lively interest in their work.

Teach actual battle drills in blocks, requiring proficiency before advancing to the next set. Constant repetition is the key to success. Hold after-action reviews following each block of instruction. Here the platoon can evaluate its own performance, and the evaluator can give an outsider's impression of the operation. The evaluator should provide criticism of the smallest details. This is necessary to enforce standards and eliminate bad habits. After initial success at battle drill, the platoon will find it easy to handle increasingly complicated scenarios. This is the goal of the cavalryman — being able to effectively react to any situation encountered.

The crux of this discussion is best summed up in the words of an old cavalry soldier, Major General Carl Von Schmidt:

> "The main point in all our work is, that there must be no inactivity, no indecision, no uncertainty; after calm conscientious reflection, we should carry out that which we have resolved upon with determination."[1]

Footnotes

[1]Major General Carl Von Schmidt, *Instructions for the Training, Employment, and Leading of Cavalry* (New York, New York: Greenwood Press, 1881), p. 10.

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REGIMENTAL REVIEW

64th Armor NCOs Inducted Into "NCO Hall of Fame"

Two NCOs from the 64th Armor, 3d Infantry Division, were among seven recent inductees into the 3d Infantry Division's "NCO Hall of Fame," the Sergeant Morales Club. They were: SFC Carl E. Christian and SSG Ronald E. Winalski of Company D, 1st Battalion, 64th Armor.

To qualify for membership in the select club, NCOs must demonstrate the highest qualities of leadership, professionalism and regard for the welfare of their soldiers.

Commenting on the selection board, SSG Winalski said: "What we didn't know, we looked into, which is something our unit does: learn from your mistakes."

SFC Christian summed up the selection process with: "Think of the three Ms — mission, men, and me. Accomplishing the mission comes first, then saving men, and finally self-improvement."

Well done, Sergeants Winalski and Christian.

New CMF 11 Grades Authorized

The reorganization of mechanized infantry and armor battalions from the H-series to J-series configuration has resulted in an upgrading of the CMF 11 NCO structures in mortar platoons. The new J-series mortar units are composed of six tube tracks and two fire direction center (FDC) tracks with a lieutenant in command.

First sergeants of infantry companies will be 11B; antiarmor companies, 11H, and Bradley companies, 11M. To provide TOE first sergeant opportunities for 11Cs, they will be first sergeants of HQ companies of mechanized infantry battalions.

In heavy mortar platoons, the platoon sergeant position will be upgraded to master sergeant, and the section sergeant position to sergeant first class. One chief computer in each FDC will be upgraded to staff sergeant. In the cavalry troop mortar section, the section leader and squad leader positions will be upped to sergeant first class and staff sergeant, respectively.

The changes are scheduled to take effect in Fiscal Year 1987.

2-66 Armor Sets USAREUR Standard

Shooting at Grafenwoehr in April, the 2d Battalion, 66th Armor Regiment, 2d Armored Division (FORWARD), based at Garlstedt, set a new USAREUR standard for Tank Table VIII. The 2/66 was scheduled to conduct tank crew qualification on Range 117 prior to moving on to the CALFEX and ARTEP evaluation. As a designated NORTHAG participant in each Canadian Army Trophy (CAT) competition, the battalion has established itself as a leader in year-round gunnery training, as well as performance during qualification.

Crewing M1 Abrams main battle tanks, the "Iron Knights" succeeded in breaking the record for first-run qualifications on Tank Table VIII by qualifying 52 out of 58 tanks, with an average of just over 839 points per tank of a possible 1000. This pace-setting performance allowed the Battalion to move on to its next mission with 21 distinguished, 18 superior, and 13 qualified tank crews. Good Shooting!

No Bull — All Bulls

There is a happy tank crew in the 1-35 Armor, 1st Armored Division, West Germany. They did what every tank crew since the invention of the tank has tried to do, and has seldom done. They fired a perfect 1,000 score on a very difficult range, Range 117 at Grafenwoehr, under Tank Tank VIII conditions.

And they weren't using the latest model main battle tank, nor was the crew made up of veteran tankers. The tank commander, for instance, Lieutenant Colonel Robert F. Brown, had only fired Table VIII once before, and the driver, PFC Walter S. Williams, had never driven the Table VII. The tank itself was a well-used M60A3 with almost enough miles on it to qualify for a complete rebuild.

But neither inexperience nor used equipment kept this determined crew from achieving the perfect score. It was also a first for Old Ironsides tankers.

Cavalry Sabers to Two West Pointers

The U.S. Armor Association has awarded cavalry sabers to two West Point cadets, commissioned in Armor, who distinguished themselves in academics and leadership. This year's winners of the annual award were Cadet (2LT) Michael R. Pompeo, for academic excellence, and Cadet (2LT) T. Ulrich Brechbuhl, for excellence in leadership.

Pompeo graduated first in the 1986 class after four years as a distinguished cadet. Following Armor Officer Basic Course attendance, he will be assigned to the 2d Armored Cavalry Regiment.

Brechbuhl graduated fourth in his class and served as Brigade Executive Officer. A distinguished cadet for four years, he also participated in the military academy exchange program at the French Military Academy at St. Cyr. Following attendance at Armor Officer Basic, he will also be joining the 2d ACR.

2LT Michael R. Pompeo

2LT T. ULRICH BRECHBUHL

COV to Switch Sides in Exercises

The counterobstacle vehicle (COV), developed by the Troop Support Command's Belvoir RD&E Center to clear safe paths through enemy barriers, will be used by opposing force (OPFOR) elements in upcoming exercises at the National Training Center, Fort Irwin, California.

The COV, which will be used to highlight any U.S. deficiencies in counterobstacle capabilities, employs a combination mine plow/bulldozer blade and telescopic arms to clear and create major obstacles and emplacements.

A prototype vehicle, which has undergone grueling tests at Fort Belvoir, VA, and Fort Knox, KY, was shown at the 1986 Armor Conference. In a complementary indoor exhibit, a scale model and videotape depicted its ability to clear minefields, antitank ditches, log crib obstacles, road blocks, and urban rubble.

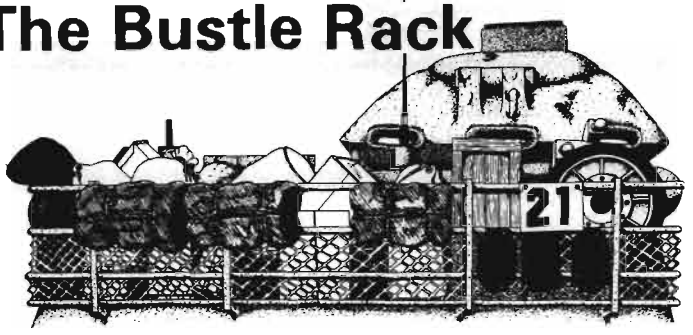
Medals and Decorations for Vets

The Korean Veterans International, an organization based in Tulsa, OK, is offering veterans a free brochure on how to obtain medals and decorations they may have earned but never received. The brochure also includes information on replacing medals and awards lost or misplaced, including a list of dealers who are able to supply them.

Copies of the brochure can be obtained by writing Korean Veterans International, P.O. Box 52003, Tulsa, OK 74152 and enclosing a self-addressed, stamped envelope.

The Red River Army Depot's maintenance shops at Texarkana, TX, are preparing to begin an overhaul program for the Bradley Fighting Vehicle following a pilot program last spring. The first Bradley to arrive, No. 472, above, came in from Aberdeen Proving Ground with 6,200 hard miles on it. Bradleys will be rebuilt from track to fire-control system in the Depot's new light track vehicle facility, which opened this year.

The Bustle Rack



1986 Armor Trainer Update Slated

The 1986 Armor Trainer Update is scheduled to be held at the USAARMS, Fort Knox, KY, from 17-21 November, according to the Directorate of Evaluation and Standardization, USAARMS.

The five-day session will be concerned with updating Armor/Cavalry officers and NCOs who are serving as instructors in schools and NCO Academies; US Army Reserve Forces (USARF) advisors and unit officers; Readiness Group Armor Assistors; Active Component (AC) staffs, and AC and USARF unit commanders on current developments in doctrine, tactics, training, and training materials. The sessions will serve as a forum for the exchange of ideas and experiences and to identify training problems or issues which require solution by the Armor community.

POC is Mr. Larry Bolls, Autovon 464-1932/7752.

Armor Branch Notes

Armor Officer Pocket Guide

The 1987-88 Armor Officer Pocket Guide has been published. The new edition contains an updated explanation of changes to the Officer Personnel Management System as well as other pertinent career and assignment information. Officers may obtain a copy by writing to the Branch address: HQ, USA MILPERCEN, ATTN: DAPC-OPE-R, 200 Stovall Street, Alexandria, VA 22332.

Conditional Voluntary Indefinite (CVI)

The results of the July Captain/CVI board have been published, but several of our officers were not considered by the CVI portion of the board because they did not have a CVI application on file. Now that the two boards are combined, it is very important that Other Than Regular Army lieutenants get their CVI applications in to Armor Branch at their 24th month of active federal commissioned service. If this is not accomplished, it will cause a delay by requiring the officer's records to appear before the next semi-annual CPT/CVI board. Commanders and S1s must ensure their junior officers do not miss this important career step. CVI is covered in AR 135-215.

New Armor Branch Chief

The new Armor Branch Chief is LTC Donald B. Smith. LTC Smith comes to the branch after recently completing a fellowship at the Industrial College of the Armed Forces. He previously commanded 4th Battalion 69th Armor in the 8th Infantry Division.

BOOKS

"...Probably the Most Important and Valuable Book Yet Written About Vietnam..."

THE 25-YEAR WAR: America's Military Role in Vietnam, by General Bruce Palmer, Jr. The University Press of Kentucky, Lexington, KY. 236 pages. $24.00.

This is an important book. It should be read by every aspiring leader, military or civilian, and especially by our young soldiers who have so much to risk in any future conflict. It's not necessarily a pleasant book to read, for General Palmer calls his shots fairly but bluntly. Yet, though it is about a searing experience for the Army of nearly two decades ago, it recounts the lessons we should have learned from that experience. That's the most important part of this very important book, probably the most important and valuable book yet written about Vietnam.

In 1950 the United States entered a new phase of warfare. We had been raised on a theory of conflict where one side won; the other lost and acceded to the demands of the winner. But the Korean War ushered in a new kind of war where military actions were far more closely controlled, even restrained, by political leaders for political gains, where the antagonists tacitly acknowledged neither side could win, and where surrender was replaced by an objective of a negotiated cease-fire. This book reviews the second such war in which American troops were engaged in large numbers.

The book is divided into two parts: the American involvement from 1963 through 1975, broken down by major changes in that involvement; and an assessment of operational performance and the development of our strategy. Finally, in the assessment, there is a section which explicitly reviews the larger lessons we should have learned. This is the key part of this book, for in today's world of increasingly frequent hostilities, we in the military services need to be able to draw on these lessons, recognize incipient problems, and act forcefully to preclude them.

And what are these lessons?

Throughout the book, General Palmer reiterates the near political vacuum that prevailed in our government on the issues growing out of World War II in the Indochina area. "...The U.S. government...was slow in recognizing the nature of the conflict in Southeast Asia and in realistically evaluating the situation in Vietnam." General Palmer returns to this theme again and again, emphasizing our government's failure to understand the rivalry of China and the Soviet Union over the future orientation of Southeast Asia, and the determintion of Hanoi to go its own way regardless of that rivalry. And he notes, "The record clearly indicates that Hanoi possessed the requisite will and was playing for keeps, while Washington did not and was not."

What General Palmer calls our "unsophisticated and uninformed American views" reflected not only the political intelligence void and the almost complete absence of experts on Asia among the players at our entry into this war, but also that the quality of those views within the government didn't improve much over time. There was no clear understanding why we were there in the first place and what we were going to do in the second.

War is an ugly and corrosive experience and no government should undertake it unless the people accept it and concede that it is in their best interests to support it. "This matter goes to the very heart of the basic problem posed by the Vietnam War — the failure of our political leaders to grasp why it was necessary to go to war...War involves fighting by the armed forces in overt operations under rules laid down by the Geneva Convention and acceded to by most civilized nations. To place our uniformed mliitary personnel in any other position is unfair to them, dishonors the military code of ethics, and constitutes a gross breach of trust on the part of their government. War must be perceived as legitimate in the eyes of the people and of the warriors entrusted to do the fighting."

The next major lesson learned concerns the poor intelligence that prevailed throughout the war. Palmer notes "...a hiatus existed for about six years with respect to work on the ground order of battle." While the Tet offensive was eventually resolved clearly in our favor militarily (albeit a disaster politically), we were surprised "by the timing (judging it would come *after* Tet), by the nature of the enemy attacks aimed at the large urban centers, by the enemy's ability to launch coordinated, almost simultaneous major attacks country-wide, and by the total weight of the offensive." Then, in March 1972, we were surprised again when "hundreds of medium tanks and armored personnel carriers poured across the DMZ, supported by heavy artillery, rockets, and modern mobile antiaircraft weapons..." If our intelligence was worth a

General Palmer's Vietnam History Is Fair but Blunt

(Continued)

hoot, how did Hanoi manage to move all that equipment, troops, and supplies forward without our knowing it? And how did they continue to surprise us over and over?

There are more lessons learned: how the Joint Chiefs of Staff waffled its responses to the President and failed to state clearly that our strategy was fatally flawed, allowing our political leaders to "embark on a murky path with unclear consequences;" our lack of a well-defined objective and an attainable strategy of a decisive nature; our increasing dependence on heavy fire support in lieu of maneuver, and our troops' growing reluctance to move beyond the range of indirect fire support, "thus surrendering the initiative to the enemy;" the excessive use of helicopters by senior commanders resulting "at times in gross supervision of, and sometimes unwarranted interference with, subordinate commanders, in particular company and battalion commanders;" the continuing need for good, solid realistic training and professionalism in our armed services; our failure to pay "sufficient attention to our number one military job, which was to develop South Vietnamese armed forces that could successfully pacify and defend their country." There's more: air support, intelligence jumble, lack of tactical security, logistics overkill, manpower policies, and personnel turbulence. And it's all clear, straight to the point, and still very timely.

Armor won a credit: "Armored units fought numerous key battles in every corps tactical zone; their heavy firepower and high ground mobility were well known to and respected by the enemy. In the dry monsoon they could operate almost anywhere, penetrating some of the most rugged and densely covered enemy war zones and base areas..." That is essentially the same lesson Field Marshal Slim preached after his Burma campaigns and wrote in his memoirs.

This book is not a compendium of small unit skirmishes (like Webb's fine *Fields of Fire*), though it does note that was the nature of the war. Instead, General Palmer focuses on the high-level leadership, both military and political, and gives us considerable insight into how decisions were made or omitted and by whom, and what some of the consequences were. It's a careful, thoughtful after-action analysis professionally done by a first rate soldier. And it's important enough to be read by everyone who aspires to be a first-rate, professional soldier.

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CAVALRY REGIMENTS OF THE U.S. ARMY, by James A. Sawicki. Wyvern Publications, Dumfries, VA, 1985. 406 pages. $25.00.

One word summarizes this latest effort of Mr. Sawicki — *superb*! In keeping with his previous works on Infantry Regiments, Field Artillery Battalions, and Tank Battalions of the U.S. Army, Sawicki's latest opus is the result of meticulous and painstaking research over a number of years. *Every* cavalry regiment that has been on the Army rolls since WWI is documented. The famous and the not-so-famous regiments receive equal billing, according to their histories. Nothing is shunted aside here.

The 149-page monograph on the evolution and history of the U.S. Cavalry is worth the price of the book, and Mr. Sawicki, no mean artist, has drawn every cavalry regiment crest and badge in the book. The three appendices: "Coats of Arms and Distinctive Insignia," "Campaign Streamers," and "Glossary of Lineage Terms," are items seldom found in a book of this nature. These and the select bibliography and the regimental index only serve to enhance the value of this book to historian, researcher, and cavalry trooper alike. Mr. Sawicki's 16 years of service with the Institute of Heraldry, USA, has eminently qualified him to complete this momentous work.

The book is dedicated to Sergeant Jack Lannen, U.S.A., "Old Bill," and a measure of the author's depth of research is contained in this quote that so eloquently details the trials and tribulations of the early cavalry commander: "I have 400 men who have never seen a horse. I have 400 horses who have never seen a man, and I have 15 officers who have never seen a man or a horse."

This is truly one of the *must* volumes for the cavalryman, whether he wears stars or stripes. If you are a trooper, your regiment is here, in full detail. The cavalry fought long and valiantly in America's wars; its units won 67 Presidential Unit Citations and 50 Valorous Unit Awards, the nation's highest organizational award for heroism in combat. One of the two original Purple Heart Medals bestowed by General Washington went to a cavalryman in the Revolutionary War. It's all here in this superb volume.

ROBERT E. ROGGE
ARMOR Staff

The Tsar's Lieutenant: The Soviet Marshal, by Thomas Butson. Praeger Publishing Co., New York, 1984. 239 pages. $27.95.

The Tsar's Lieutenant is perhaps one of the best biographies — and certainly one of the few in the English language — on the life and career of Marshal Mikhail Nickolevich Tukhachevsky, the famed Soviet marshal, who was ruthlessly eliminated during Josef Stalin's bloody purges of the Red Army in the mid-1930s. Tukhachevsky's importance in the history and development of the Red Army is unparalleled — indeed, many historians state that Tukhachevsky can be considered the true father of the Soviet Army.

Born of upper middle-class parents in Tsarist Russia in 1893, Tukhachevsky soon entered the Tenth Moscow Gymnasium and later the school's Corps of Cadets. While in school, he became a devoted student of military history studying Napoleon, Suvorov, Clausewitz, and other military greats. At the outbreak of World War I, he was commissioned a junior lieutenant in the prestigious Semyenovsky Guards and was sent directly to the front, where he soon distinguished himself in several battles. After the Russian disaster at Tannenberg, he was assigned to the Southern Front, where he was soon captured and spent the remaining years of the war as a POW. While in captivity, he met another officer and fellow POW, Captain Charles De Gaulle, whose later writings on armored warfare would have a great influence upon Tukhachevsky's mechanization of the Red Army in the 20s and 30s.

After the war, Tukhachevsky became a Bolshevik and offered his services to the Soviet government, whereupon he was charged with the task of organizing, training, and equipping the infant Red Army. As Butson illustrates most graphically, Tukhachevsky threw all of his talent and energy into the task at hand and succeeded in forming a potent fighting machine that not only defeated the various White Armies during the Russian Civil War, but would later inflict a series of defeats on the Polish Army before being defeated — through no fault of Tukhachevsky's — before the gates of Warsaw in 1920.

Tukhachevsky's greatness, however, does not necessarily rest upon his battlefield experiences, but on his innovations in the operational and technological aspects of the art of war. These innovations live on in the Soviet Army of today.

One of Tukhachevsky's greatest innovations was his emphasis on the use of mobile tactical formations designed to attack fast and penetrate deep into the enemy's rear. Honed in the latter stages of WWII on the Eastern Front and in Manchuria, this concept is currently the basis for the Soviets' Operational Maneuver Group doctrine.

He likewise called for the use of combined arms (armor, artillery, infantry, and aviation) in a "lightning attack," or "blitzkrieg," so effectively used by both the Germans and later the Soviets during WWII.

And while Tukhachevsky is credited with the mechanization of the Soviet

Army, he also stressed the importance of being able to defeat the enemy's main forces — the primary concept behind the OMG doctrine. He stressed two points: that "one must concentrate on the enemy's weakest and most vulnerable points;" and "A commander must be able to exploit an area that can be identified as being 'decisive' to achieving victory."

Tukhachevsky urged cooperation with the German Reichswehr during the 1920s, following the Treaty of Rapallo in 1922, believing (rightfully so) that the Red Army would benefit greatly from just such an exchange of military doctrine and technology.

He advocated and organized the first Soviet Air Armies — complete airborne armies, of which the Soviets have seven today. These armies are completely self-supporting, having *organic* armor and fire support in order to strike deep and fast into an enemy's rear areas.

It was Tukhachevsky who is responsible for the founding of the Soviet rocket industries in 1928. He advocated the design and development of the multi-barreled rocket launchers used so effectively by the Soviets on the Eastern Front during WWII.

Tukhachevsky was also interested in military engineering, designing the concrete fortifications around the city of Leningrad that, from late 1941 to 1944, saved the encircled Soviet defenders of that city during a German onslaught and seige of three years.

He also proposed the idea of a "Flying Tank," or "Flying Artillery.," the conceptual forerunner of the much-feared Mi-24 "Hind" helicopter gunship. Tukhachevsky also believed that the Soviet Army would require, in all future wars, an efficient air transport service, the development of which assisted the Soviets well during the 1973 Yom Kippur War, and during the massive invasion of Afghanistan in 1979.

Tukhachevsky also saw to it that 90 percent of the Red Army's artillery was self-propelled ("Samokhadnaia Ustanovka") (SU), a factor that contributed to the Soviet victory at Kursk in 1943.

Butson's book draws on Soviet as well as other Western sources, and while depending upon Professor Erickson's *The Soviet High Command,* he also uses Tukhachevsky's own writings, as well as those found in the German Archives on the period of *rapproachment* with the Soviet Army during the 1920s.

Tukhachevsky was, as Butson writes, an enigma that never could be eliminated in the military thought and doctrine of the Soviet Army, despite his alleged crimes against Stalin. His greatness was in ability to foresee what the Red Army would need — in both tactics and equipment — and how both of these could be used together effectively.

He did not live to see the fruition of his labors. This was left to men such as Georgi Zhukov, one of his staff aides, and others faced with the grim task of defeating the Germans in the "Great Patriotic War." Much of Zhukov's success can be directly attributed to Tukhachevsky's pre-war plans for the Red Army.

Butson's book is highly recommended for the serious student of military history, particularly for those interested in the Soviet military. While the book is a biography, it also represents "must reading for those who analyze the Soviet Army since it illustrates the origins of many present-day Soviet military trends and development. This is a book that would make a fine addition to a professional library.

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What WW III Might Be Like: Two New Books:

First Clash: Combat Close-Up in World War Three, by Kenneth Macksey. Arms and Armour Press, London, UK, 1985. 248 pages. U.S. price, $19.95.

"The warning order had reached 4CMBG at 1600 hours, having left HQ VII Corps the moment it was plain to their commanders that his counterattack had irretrievably failed." With these opening words in one of his first chapters, Macksey frames the urgency of the tasks at hand for the men of the 4th Canadian Mechanized Brigade Group in a fictionalized account of a classic armor battle. The locale is West Germany during the opening days of World War III.

At face value, the book might appear to be similar to General Sir John Hackett's *The Third World War, August 1985,* but *First Clash* concentrates on warfare as seen by tankers and infantrymen at the platoon, company, and battalion level. He writes in vivid detail of their anxiety at what awaits them during deployment and as they take up battle positions prior to being probed by reconnaissance elements of the Soviet 1st Guards Tank Division. When the heat of the main battle is described in vivid detail, the reader feels as if he is there in person.

First Clash also puts in perspective the command pressures for success placed on both the defenders and the attackers, both through the eyes and thoughts of the men fighting and dying, as well as from the standpoint of officers commanding the units engaged. The book is filled with photos taken during actual field exercises. It also capsulizes key leadership and tactical lessons, which are worthwhile for all commanders and staff officers to take note of.

Additionally, for anyone who has ever worked with the 4CMBG, the book is simply a pleasure to read, for it contains the special lingo of a sister NATO ally, who, although he also speaks the English language as a native tongue, has differing and colorful terminology unique to his heritage.

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RED STORM RISING, by Tom Clancy. G.P. Putnam's Sons, 1986. 652 pages, $19.95.

If you haven't read Clancy's first book, *The Hunt for Red October,* do so. It is superb. However, if you haven't read his second novel yet either, get it now and read it now. *Red Storm Rising* is even better than Clancy's first book.

Tom Clancy writes with a realism that makes one wonder if he hasn't been a member of both the Soviet and the US military establishment. He hasn't, but he knows both very, very well. *Red Storm Rising* is the story of World War III in Europe and the Atlantic. The entire novel is reminiscent of Sir John Hackett's opening chapters in *The Third World War, August 1985. Red Storm Rising,* though, is one of the best war novels to come out in the last twenty years. Clancy doesn't claim to be predicting anything; he simply is telling a story. Or is he?

The reader of this book sees the war through the eyes of the intelligence officer, the pilot of a STEALTH F-19, the submarine captain, an isolated US Air Force lieutenant on an invaded Iceland, a US Navy frigate captain, the platoon leader in the 11th Armored Cavalry Regiment, and SACEUR. But we also get the other side. From the highest levels of Soviet political leadership to the commanders of Soviet airborne and tank divisions, we live the opening weeks of World War III.

The action is fast-paced and real. Clancy recreates the tension of waiting for a Soviet regimental attack and the action that results within the turret of the M1. We live through the stress faced by seamen in the combat information centers on board both our nuclear submarines and our surface action ships. We learn what it's like to attack across the Inter-German border at treetop level in the dark of night inside the super-secret F-19 STEALTH aircraft.

Clancy claims to have gotten all of his information from "open sources;" that may be true, but what he does with that information is almost magic. For soldiers, sailors, airmen, marines, and civilians — on both sides of the "fence" — *Red Storm Rising* is a winner.

G. PATRICK RITTER
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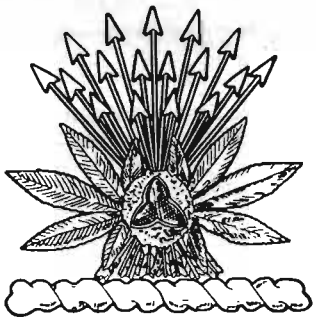

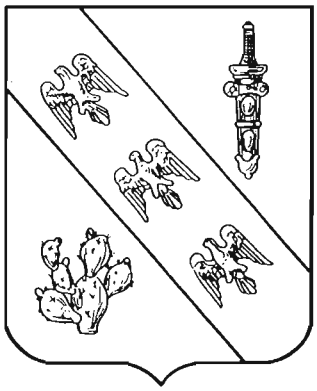

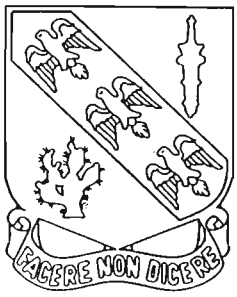

Symbolism

The shield is yellow for cavalry. The bend charged with the alerions, from the arms of Lorraine, symbolizes World War I service; it is red to indicate that the regiment served as field artillery during that period. The Roman sword in sheath is for service in the War with Spain and the cactus signifies Mexican border duty.

Distinctive Insignia

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

107th Armored Cavalry

Facere non Dicere

Lineage and Honors

Constituted 7 May 1877 in the Ohio National Guard as unattached troops of cavalry; organized in 1877 as follows: Troop A (Cincinnati), Troop B (Hillsboro), and Troop C (Shelby). (Between 1877 and 1898 there were several changes in the troops, including the disbandment of the three above and the organization of the 1st Cleveland Troop [28 April 1886] and the 2d Cincinnati Troop [13 December 1894]. Reorganized and redesignated 3 May 1898 as the 1st Ohio Volunteer Cavalry. Mustered into Federal service 9 May 1898 at Camp Bushnell, Ohio; mustered out 22 October 1898 at Cleveland and continued as Troops A and B. Reorganized 25 July 1910 as the 1st Cavalry Squadron with troops as follows: Troop A (Cleveland), Troop B (Columbus), Troop C (Cincinnati), and Troop D (Toledo). Mustered into Federal service 6 July 1916 at Cleveland for service on the Mexican border; mustered out 28 February 1917 at Fort Benjamin Harrison, Indiana. Expanded and redesignated 16 April 1917 as the 1st Cavalry; reorganized and Federally recognized 9-18 May 1917.

Expanded, converted, and redesignated 23 May 1917 as the 2d and 3d Field Artillery. Mustered into Federal service 3-5 August 1917 at Cleveland and Youngstown, respectively; drafted into Federal service 5 August 1917. Redesignated 15 September 1917 as the 135th and 136th Field Artillery, respectively, and assigned to the 37th Division. Demobilized 10 April 1919 at Sherman.

Converted, reorganized, and Federally recognized 20 October 1919 - 18 November 1920 in the Ohio National Guard as the 1st Cavalry. Redesignated 1 July 1921 as the 107th Cavalry, an element of the 22d Cavalry Division. Reorganized 1 November 1940 as the 107th Cavalry (Horse-Mechanized) and relieved from assignment to the 22d Cavalry Division. Inducted into Federal service 5 March 1941 at Cincinnati. Reorganized 30 March 1942 as the 107th Cavalry (Mechanized).

Regiment broken up 1 January 1944 and its elements reorganized and redesignated as follows: Headquarters and Headquarters Troop as Headquarters and Headquarters Troop, 107th Cavalry Group, Mechanized; 2d Squadron as the 107th Cavalry Reconnaissance Squadron, Mechanized (1st Squadron as the 22d Cavalry Reconnaissance Squadron, Mechanized — hereafter separate lineage).

After 1 January 1944, the above units underwent changes as follows:

Headquarters and Headquarters Troop, 107th Cavalry Group, Mechanized, inactivated 6 March 1945 at Camp Polk, Louisiana. Reorganized and Federally recognized 18 February 1947 as Headquarters and Headquarters Troop, 107th Cavalry Group, at Cleveland.

107th Cavalry Reconnaissance Squadron, Mechanized, inactivated 16 November 1945 at Camp Bowie, Texas. Reorganized and Federally recognized 10 November 1947 - 16 March 1948 as the 107th Mechanized Cavalry Reconnaissance Squadron with Headquarters at Cleveland.

Headquarters and Headquarters Troop, 107th Cavalry Group, and 107th Mechanized Cavalry Reconnaissance Squadron consolidated 15 September 1949 with the 185th Tank Battalion (organized and Federally recognized 12 December 1946 - 30 March 1949 with Headquarters at Cincinnati); consolidated unit designated as the 107th Armored Cavalry. (3d Squadron allotted 1 May 1968 to the West Virginia Army National Guard — separate lineage.)

Campaign Participation Credit

World War I

Lorraine 1918

World War II

Northern France

Rhineland

Central Europe

Howitzer Battery, 1st Squadron (Lakewood), additionally entitled to:

World War II-AP

Northern Solomons

Luzon (with arrowhead)

Howitzer Battery, 2d Squadron (Lakewood), additionally entitled to:

World War II-AP

Northern Solomons

Luzon

Decorations

Howitzer Battery, 1st Squadron (Lakewood), and Howitzer Battery, 2d Squadron (Lakewood), each entitled to:

Philippine Presidential Unit Citation, Streamer embroidered 17 October 1944 to 4 July 1945 (145th Infantry and 135th Field Artillery Battalion cited; DA GO 47, 1950)