

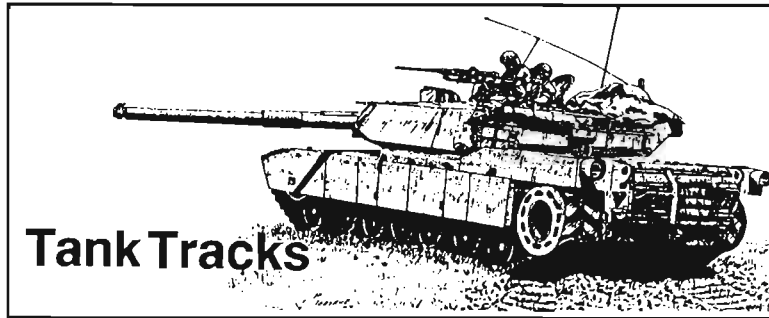
# ARMOR

## A MEMORIAL FOR THE ARMORED FORCES



### A Galaxy of Stars Dedicates Armored Forces Monument On Veterans Day

See Page 33



## A Monument to Armored Warriors

*"A balance team of combat arms and services of equal importance and equal prestige."*

Such was the vision of MG Adna R. Chaffee, the first Chief of Armor and the "Father of the American Armored Force." These words are now etched in granite in Washington, D.C. to serve as both a memorial to those who have fought in steel steeds and as an inspiration to future generations of Americans who view our new monument in our nation's capital.

As with all things worth waiting for, this monument did not come easy. The original idea sprang up in 1983, but the proposal failed to make it through the House of Representatives. Led by Congressional liaison committee member COL Jimmie Leach (Ret.) and others, the second attempt made it through both houses of Congress late in the last session of the 99th Congress, with the help of Senator Strom Thurmond and Representative Floyd Spence, both of South Carolina.

The fund-raising effort began in earnest, ably led by COL Duke Wolf (Ret.), who was to work untiringly and without compensation until the idea became solid granite.

It is impossible to give due credit to all those who gave time and money to this project, but some need to be mentioned. The dozens of veterans organizations, including the 16 Armored Division Associations and Tank Destroyer Association, donated money repeatedly. There were more than 10,000 individual contributors, most of whom were veterans, their widows, and their families.

Despite the fund-raising progress, the original dedication date of November 11, 1990, had to be postponed because funds were still insufficient. Now the committee was up against the deadline of the five-year window imposed by the public law to complete the monument.

In stepped others to help. The Veterans of Foreign Wars contributed significantly through its more than 1100 posts and Ladies Auxiliaries. General Dynamics Corporation, under the leadership of Gordon England, spearheaded the defense industry endeavor, and our Arab allies in Operation DESERT STORM combined to meet the expenses.

Congratulations and special thanks go to the dozens of retired officers, NCOs, and veterans who comprised the Armored Forces Monument Committee, led initially by the late GEN Bruce C. Clarke, followed by GEN Bruce Palmer Jr., and LTG Robert J. Baer. Mission accomplished! And to the thousands who gave a little or a lot, who gave valuable time, and gave of themselves to help make this idea a reality — a hearty "well done." You have not only created a granite tribute to your deeds and the memories of your comrades that will stand forever, but you have etched in the hearts of all involved your pride and devotion to duty in having served your country.

The monument is a simple, elegant design, beautifully carved by the artisans of the North Barre Granite Company of Vermont, and is a fitting, permanent tribute to the armored warriors from 1918 to 1991.

— PJC

By Order of the Secretary of the Army:

GORDON R. SULLIVAN  
*General, United States Army*  
Chief of Staff

Official:

MILTON H. HAMILTON  
*Administrative Assistant to the*  
Secretary of the Army

# ARMOR

*The Professional Development Bulletin of the Armor Branch PB-17-91-6*

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# LETTERS

## Surprised at Our Success?

Dear Sir:

The article in the July-August 1991 issue of *ARMOR* about 2/2 ACR forces this Marine tanker to speak out. Of particular amazement was the author's choice of words concerning activities on the 24th of February. The phrase "due to the significant unanticipated success of ground attacks in southern Kuwait by elements of two Marine Divisions"..., requires response. Why the surprise? We are educated at your Armor School, use tactics we learn

there, and fight tanks designed and built by the lead service, the Army. We read your professional magazine.

Attacking at odds of 2 to 11 did not bother us. (I have to say that.) With our Marine Air Ground Task Force doctrine, aviation is a integral part of any ground campaign. We supplement our lack of armor and artillery with integrated air.

We were a supporting attack. We in 1st Marine Division with M-60s had no desire to fight the RGFC heavy divisions. That's your job. The lighter divisions defending the border were well within our capability to defeat. They had been sufficiently attrited by

coalition air. The CINC, with the advice of our Marine Expeditionary Force commander, Lieutenant General Boomer, allocated forces and missions to combat capability.

At the Army and Marine Corps level, we may be arguing about roles and missions. Down at the tactical level, I doubt 2nd Brigade, 82nd Airborne Division could care less which service got a tank battalion in country first as long as it got there, quickly. Along with my brother tank battalion commander, I could sleep at night once the 197th landed with two M1 and one Bradley battalions.

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Just because we're "Soldiers of the Sea" does not mean we can't still fight a ground campaign.

A. B. DIGGS  
LTC, USMC  
Former CO, 3d Tank Bn  
Task Force Ripper

## Relating Battlefield Success To Political Objectives

Dear Sir:

Dr. Brian Holden Reid has performed a valuable service for the proponents of maneuver warfare by clearly outlining the views of General J.F.C. Fuller ("Major General J.F.C. Fuller and the Problem of Military Movement," *ARMOR*, July-August 1991). His clear explanation of the need for simultaneous offensive and defensive operations is a realization that most advocates of maneuver warfare fail to make.

In a recent letter to *Military Review* (July 1991), I argued that one of the failings of AirLand Battle Future doctrine (now known as AirLand Operations) was its failure to proceed beyond the thinking of the Napoleonic era. In that argument, I was addressing the lack of a discussion of the fixing force by the proponents of the new doctrine. It appears that the revision of the doctrine will take Fuller to heart and address this shortcoming. However, both Dr. Reid's article and AirLand Operations suffer from a fatal omission — the discussion of victory criteria.

Dr. Reid correctly identifies that for Fuller the decisive point of attack is the rear of the enemy's army and that, "...we must remember that the object of military operations is the destruction of the enemy's weapon power, his capacity to fulfill the tactical function, which is the prime object of the maneuver battle. His organization must be shattered." This is the CRITICAL MISTAKE that all advocates of maneuver warfare make — they fail to relate battlefield success to the achievement of political objectives. We must always remember the Clausewitzian admonition that war is a continuation of politics by other means.

Before we can plan for or conduct a military campaign, we must understand the conditions that our political leadership desires that we create. What are the conditions that should exist when combat operations are concluded? The answer to this question is key to the type and nature of military operations that we undertake. Sun Tsu would have us believe that, in most cases, the answer to this question would cause us to attack the enemy's strategy

rather than his army. We should attack his strategy so as to convince him of its futility and the need for him to change his political objectives. General Andrew Beaufre said it clearly when he wrote:

"The outcome desired is to force the enemy to accept the terms that we wish to impose upon him. In this dialectic of wills, a decision is achieved when a certain effect has been produced on the enemy; when he becomes convinced that it is useless to start or alternatively continue the struggle."

If our opponent changes his political objectives as a result of our military, economic, and/or political activities, then our effort has been successful. What must we do to achieve this? In my opinion, we must successfully attack the opponent's military and political centers of gravity while defending our own. This may be his army's rear, or it may be an individual or small group. For every conflict, the centers of gravity will be different and must be identified early on. An understanding of this concept of victory — successful attacking of the enemy's center of gravity and defense of our own, such that the enemy decides to change his political objectives — and the mental flexibility that it implies, is a much more sophisticated and difficult task than a simple focus on the enemy's rear.

The reader of Dr. Reid's fine summary of MG Fuller's thoughts should take with him the concept "that the entire operation should be conceived as an intellectual whole, and not viewed as a string of miscellaneous general engagements that have no relationship with one another. **Each battle should be regarded as a stepping stone to the successful conclusion of the war and should make a distinct contribution to the overall plan.**" (Emphasis added.) If we can translate the conditions that the political leaders want to exist at the end of a conflict, as discussed earlier, into military objectives and then backward plan and synchronize our campaign, as suggested in the above quote, we can successfully attack our opponent's centers of gravity while defending our own. This will cause the enemy to change his political objectives to accommodate ours and thus result in victory.

The challenge to the mobile force of the future is to develop the mental flexibility required to accomplish the above. *ARMOR* has contributed to that process by the publication of Dr. Reid's excellent summary of the thoughts of Major General J.F.C. Fuller. Keep up the good work.

BRUCE B.G. CLARKE  
COL, Armor  
Carlisle, Pa.

## Guns of the TDs

Dear Sir:

In regard to LTC Herman's letter in the July-August 1991 issue of *ARMOR* wherein he states that his Tank Destroyer (TD) unit in WWII had "...the M10 tank destroyer with a naval 3-inch gun, ...," I can only surmise that his unit must've had a lot of trouble in obtaining Navy ammunition, because it was surely the only TD unit so equipped!

In fact, the M10 TD had the Army 3-inch Tank Gun M7, an adaptation of the towed 3-inch Antitank Gun M5, using the same cartridge family. Neither the gun nor the cartridge are derived from naval antecedents. The M7 Tank Gun did use cartridges whose ancestor was the ammunition used in the Army's 3-inch (15pdr) Seacoast Gun, Model of 1898. That is, the ammunition used the same cartridge case design, but was assembled with more modern propellant and projectiles to be used in the M7 Tank Gun, as well as in other weapons chambered to use the same ammunition.

Caliber alone tells nothing about size, weight, performance, cost, ancestry, or much of anything of importance about ammunition or guns.

DONALD J. LOUGHLIN  
Pleasanton, Calif.

## Should Tanker Badges Be Retroactive?

Dear Sir:

I have read with interest in the past two issues, letters from lieutenants proposing the issue of a combat tanker badge to DESERT STORM participants.

I applaud and support the proposal. However, none has recommended that such an overdue recognition for tankers be retroactive.

Shame on them for limited historical insight. As a cavalry officer in Our Most Protracted War, as opposed to The Brief War, we spent 100 hours of combat in most any given week.

True, our war wasn't against enemy tanks, but the RPGs were a constant fact of life (and often death), as were mines and booby traps. And our armored vehicles burned MOGAS, which when hit erupted into a deadly fireball.

Many of my comrades from the 3rd Squadron, 5th Cavalry are now remembered only on a black granite wall in Washington, and by their families and former fellow soldiers.

*Continued on Page 40*

# COMMANDER'S HATCH

MG Thomas C. Foley  
Commanding General  
U.S. Army Armor Center



## An Armored Force For The Future 2000 And Beyond — Technology

(Part II)

*I began this discussion of technology and the Armored Force beyond the year 2000 in the September-October issue. I addressed the size and missions of the future force, the future MBT and AGS systems, and how we look to take advantage of technology to enhance battlefield efficiency, survivability, and mobility. I continue now to examine other significant technology issues that merit our attention so that we can field a superb Armor Force into the next century.*

Our scouts desperately need a future scout vehicle (FSV). This vehicle will have many of the advanced capabilities already discussed. Key technolo-

gies in the development of the future scout vehicle will be the use of low-observable technologies and light weight, composite materials for both its structure and its armor. Other important technologies to the FSV are in the sensor area. Hand in hand with the sensors, the FSV will require very long range, secure communications with the capability to integrate data from a variety of sensors and sources. As with the future main battle tank, the FSV will also need to conduct extended autonomous operations. On the AirLand Operations battlefield the future scout vehicle will conduct various missions for extended periods of

time and in locations remote from friendly forces. With the application of these technologies, the future scout vehicle will be a vital piece of equipment to the Total Army.

We in the Armor Force need an all-weather missile system for the FSV that has a capability to successfully engage threat vehicles at longer ranges, at an increased rate of fire, and with a reduced time of flight compared to current systems, such as TOW.

In addition to our future combat systems, there are numerous other systems, what I call the tools of mobile armored warfare, which will play a

---

vital role on the future battlefield. These are not major weapons systems. Rather, they are relatively inexpensive combat multipliers like quick erection antenna masts or items which enhance the habitat of our fighting vehicles.

A vital area for the Armored Force is our command and control subsystem. With the application of advanced sensors, and automated command, control and communication systems, an overwhelming amount of tactical and operational information will flood commanders and staffs, who are already stressed by continuous operations. Armor commanders and their staffs will require a modern command and control system. They need one that will reduce soldier workloads and enhance soldier endurance as much as possible. These requirements are encompassed by the need to streamline methods of information fusion, correlation, and presentation; to simplify methods of generating orders, overlays, and reports; and the critical need for increasing our command post mobility, survivability, and functionality. Many of these needs will be influenced through technological advances in electronics, communications, and artificial intelligence, and their ability to provide innovations and applications in reconnaissance, surveillance, and target acquisition systems, robotics and space programs, and operational decision support systems.

Our analysis over the last several years and our experience in SWA have highlighted the importance of these concepts to operational effectiveness. Just now are we coming to grips with the potential benefits of real-time and near-real-time information sharing between tanks and units in our M1A2 testing in California. The M1A2 is vital not only to continued tank modernization, but also because of its role as a bridge to help us understand and learn to apply these capabilities.

Technology will allow the Armor Force of the future to make great advances not only in mission execution,

but more dramatically in mission planning. In the future, the commander will have the capability to "fly" through a digitized rendering of tactically or operationally important areas of interest in order to observe terrain and the disposition of forces on that terrain. This will provide the commander and his staff with a complete mastery of his geographical and battlefield geometry as it unfolds. Advances in the integration of battlefield intelligence and information will provide the commander's staff with an adaptive analysis and asset management system, which will include single-, multiple-, and all-source processing and analysis. This smart fusion system will have self-learning capabilities that the staff can easily adapt to changing battlefield conditions.

Last, the Armor Force's communications will consist of systems that are high volume, high speed, antijam, with low intercept probability, and capable of operating over extended ranges in all types of terrain and weather.

In order to maintain the momentum of the attack, armor forces require future systems that will incorporate advanced technologies to improve our mobility and countermobility capabilities. We need an improved vehicle-mounted mine detection system, which will provide the capability for mounted units to detect metallic and nonmetallic mines both on and off routes of march, whether the mines were emplaced by conventional or remote techniques.

The system would have an advanced detection array using X-ray backscattering imagers, acoustic and seismic detectors, and even electromagnetic mine detectors to determine mine location. Such a system would provide the Armor Force the capability to detect all types of mines at combat speeds, rather than the lower speeds required today for mine clearing operations, and in a wider path than the width of the vehicle.

Our scouts require the same type of capability in a manportable configuration. The manportable system must have the capability to detect all types of mines at distances of 10 to 30 meters to allow the dismounted scout to conduct effective reconnaissance. In the area of countermobility, we need a smart minefield system that will allow us to move the minefield automatically and defeat targets through top, bottom, or side attack at extended ranges.

The one important "system" that we cannot forget is the Armor crewman. We must ensure our crewmen have not only the finest equipment, but also the finest self-protection equipment. We envision a follow-on to the soldier integrated protective ensemble. What we need is an Armor crewman integrated protective ensemble. This will give the individual vastly improved capabilities on the battlefield: a system consisting of a suite of individual weapons, to include missiles and directed energy systems; helmet integrated communication, fire control and posnav capabilities; high speed data management processing capabilities; laser alarm systems; and an exoskeleton contributing to enhanced mobility. The system would also include advanced encapsulated feeding, medical self help, and individual decon capabilities. We believe the concept of mission oriented protective posture (MOPP) needs to be expanded to include when to wear body armor and protective goggles.

In order to further assist the mounted warrior to manage and accomplish the myriad combat tasks he is assigned, robotics may be a solution. Robotics hold the promise to ease greatly the burden on the soldier to conduct sustainment operations. Robotic vehicles that can move about the battlefield under the control of a base station or work autonomously will enable systems to be refueled and rearmed in a more efficient manner. Think of the benefits of robotic fuel, ammunition, food, and medical vehicles, which

drive to a predetermined point to meet a company of tanks to conduct resupply operations. While the crews conduct personal hygiene and draw food from robotic vehicles, other robotic vehicles control the combat vehicles and conduct resupply and rearming operations. Those vehicles requiring maintenance are repaired by robotic systems, and injured soldiers mount robotic vehicles to be transported to the aid station. Imagine the time saved and effort saved by not having the soldier conduct these routine resupply operations. In addition, robotic vehicles could conduct chemical detection missions and decon missions without exposing the soldier to deadly chemicals. They could also serve as autonomous sentries and decoys to enhance the overall lethality and survivability of the force. Some of the other areas of concern in which technology can play a vital role are camouflage, laser protection, and biotechnology engineering.

Highly sensitive and long range sensors will inundate the battlefield of the future. They will operate in all areas of the electromagnetic spectrum. To thwart the enemy's sensors, intelligence gathering capability, and smart munitions with multi-spectral camouflage may be a very cost effective way of increasing survivability on the battlefield.

Lasers on the battlefield of the future will not be limited to ranging and designating operations. They will be used to incapacitate or even destroy. We must protect our optics and our soldiers. Some of the technologies that may prove beneficial are holographic filters, sacrificial mirrors and coatings, non-linear processes and optics, and scattering cells. Biotechnology engineering may hold the promise of light weight personal ballistic protection with advanced fiber technology. Also, biotechnology may hold the promise of quick, effective medical self help on the battlefield.

Training cuts across the entire domain of lethality, survivability, and mobility. Without trained soldiers, leaders, and units, all of our equipment and doctrine is worthless. In these days of scarce time, space, fuel, ammunition, and money resources we need to be able to conduct fast-paced, combat-oriented, realistic training. Embedded training is one potential answer. It can be conducted at unit level, even up to battalion or brigade. These operations can run the gamut of combat missions the unit may face. Automated manuals in the vehicle are a must. The crewmember needs to be able to access his manuals without leaving the vehicle and without having to worry about the space the manuals require. He simply pushes a button, and the manuals appear on the screen at his workstation. This includes maintenance, SDT, CTT, field manuals, and appropriate SOPs.

Here at the Armor Center our foremost combat development tool, the Close Combat Test Bed (CCTB), with its simulation networking technology, has already initiated the path to hardware developments for the 21st century. Recently transitioned from DARPA to Army control, this unique man-in-the-loop distributed simulation has great potential to accomplish more cost effective, technically difficult combat developments, while substantially reducing troop support requirements.

Because it is an interactive simulation, many MANPRINT and human engineering aspects of hardware development can be addressed thoroughly. Because of the flexibility in the simulation, changes can be implemented quickly to make evolutionary design changes in new hardware, address multiple courses of action regarding sensor, target acquisition or survivability packages, or pursue evolving technologies. The ability to tune both the hardware and software to a greater or lesser level of fidelity gives our combat developers more in-

sight into the impacts of current and futuristic threat capabilities.

Currently, the CCTB is slated for experiments in the areas of battalion and below command and control, communications speech intelligibility, line of sight antitank development, X-rod ammunition tactical employment, as well as our first endeavor to explore required operational capabilities requirements for the vehicle integrated defense system. The ASM Common Chassis Program is using CCTB technology to evaluate the design and functionality of the FMBT (Block III) crew compartmented hull, and the composite armored vehicle program will interface its Advanced Technology Transfer Demonstrations (ATTD) with the rapidly expanding combined arms battlefield to evaluate various emerging technologies in the late 1994-2000 timeframe.

The CCTB itself is going through a development phase to become the battlefield distributed simulation developmental facility for the Armored Force. This transition will bring more realism to the simulation, a greater level of fidelity, a tunable OPFOR, and a host of environmental improvements, which will make battlefield replication of Armor 2000 and beyond possible.

I'd be remiss if, after this quick tour through our technological challenges, I didn't come back to the very heart of our vision — that armor soldiers and leaders are the key to our future. I am confident that we can continue to provide the kind of mounted warrior who performed so magnificently in the deserts of Kuwait and Iraq. We can meet our mission demands by melding U.S. technology with American armored crewmen and ensuring they are trained to standard. In the next issue we will examine our strategies for Combined Arms Training in the future.

Forge the Thunderbolt!



*CSM Jake Fryer  
Command Sergeant Major  
U.S. Army Armor Center*



## Don't Forget the Observer

Twenty-two years ago, while serving as a scout observer with C Troop, 2d Squadron, 9th Cavalry, I was, by proxy, relegated to specific duties when the unit deployed to the field. These duties included, but were not limited to, ammunition pad specialist and guard, kitchen police, barrier/range guard, tank trail police, target detail, fire guard, and beer hall superintendent; additionally, I was labeled "JAFO" or "worm."

It's sad for me to report that, force wide, some of our observers — great soldiers whose abilities aren't being maximized — are subjected to the same abuse Jake Fryer was subjected to over two decades ago! Why do we still believe the "D" in 19D stands for detail? Why do we berate these dynamic, highly talented soldiers?

Maybe I was treated that way because my leaders at the time weren't aware of the preliminary training I had received prior to arriving at their unit. A 19D OSUT graduate has:

1. completed basic soldierization training, i.e., UCMJ, Code of Conduct, heritage and traditions, inspections, dismounted drill, check cashing, etc.
2. passed the APFT.
3. participated in tactical foot marches.
4. cleared, loaded and maintained an M16A1 rifle.
5. qualified with an M16A1 rifle.
6. engaged targets with an M16A1 rifle using a PVS-4.
7. cleared, loaded, and maintained an M203 grenade launcher.
8. engaged targets with an M203 grenade launcher.
9. cleared, loaded, and maintained an M60 machine gun.
10. engaged targets with an M60 MG.
11. engaged targets with an M60 MG using a PVS-4.
12. fired a subcaliber AT-4 LAW.
13. thrown a live hand grenade.
14. performed individual tactical tasks, i.e., react to flares, movement techniques, and camouflage.
15. used PVS-7 night vision goggles.
16. negotiated an infiltration course.
17. participated in a five-day FTX.
18. used and maintained an M17 and M25 protective mask.
19. been through the gas chamber.
20. worn MOPP IV for four continuous hours.
21. performed personal NBC decontamination.
22. identified chemical agents with M8 detector paper.
23. detected chemical agents with M9 detector paper.
24. performed basic first aid tasks.
25. operated and maintained PRC-77 and VRC-64 radios.
26. operated and maintained TA-1 and TA-312 telephones.
27. had introductory training on SINGGARS radios.
28. prepared and sent radio messages and spot reports.
29. recognized friendly and Soviet vehicles and aircraft, as friend or enemy.
30. identified Soviet aircraft by name.
31. identified Soviet weapons.
32. collected route classification data.
33. read grid coordinates on a map.

34. determined elevation, measured distance, and identified terrain features on a map.

35. determined azimuths with a compass and converted magnetic and grid azimuths.

36. negotiated a compass course.

37. prepared demolition charges.

38. installed/removed dummy M14 and M16 AP mines.

39. installed/removed dummy M15, M19, and M21 AT mines.

40. installed and removed a dummy claymore mine.

41. installed a dummy mechanical ambush. (M18)

42. probed for mines.

43. acquired a basic knowledge of installing booby traps.

44. acquired a basic knowledge of neutralizing enemy mines and booby traps.

45. acquired a basic knowledge of calling for and adjusting indirect fire and estimating range.

46. acquired a basic knowledge of the CEOI and codes.

47. ground guided vehicles with hand and arm signals.

48. prepared DA Form 2404 and DD Form 1970 (Dispatch).

49. loaded vehicle smoke grenade launchers.

50. performed vehicle recovery operations.

51. drove an M998-series vehicle (HMMWV) at slow speeds on roads and cross country for six miles.

52. performed operator's maintenance on an M998-series vehicle.

53. driven an M3 at slow speeds on roads and cross country for 18 miles.

54. extinguished a fire on an M3. (simulated)

55. prepared an M3 for fording operations.

56. performed operator's maintenance on an M3.

57. performed emergency evacuation from an M3.

58. engaged targets with the coax MG on an M3.

59. cleared, loaded, and maintained a 25-mm gun.

60. loaded and unloaded 25-mm ready boxes on an M3.

61. engaged targets with the 25-mm gun on an M3.

62. performed TOW, 25-mm gun, and M240C coax MG misfire procedures.

63. prepared a range card for an M3.

64. loaded a TOW missile launcher on an M3.

65. cleared, loaded, and maintained an M240C coax MG.

66. had mechanical training on an M2 .50 cal MG.

Even though we could train him better at the institutions, we rely on him to initiate a program of self study. But more importantly, we're reliant upon the unit to maximize on the training we've given him and, somehow, continue to challenge him through tough, realistic training programs — not tedious, mundane details.

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# The Guns of the Cavalry

by Captain Michael J. Reagor

*WWII Innovation Gave Cav Commanders  
An Indirect Fire Advantage*



*WWII-Era M-8 Assault Gun*

The Second Regiment of Dragoons, the Regiment of Mounted Riflemen, and the Blackhorse Regiment conjure up histories rich with tradition, bravado, and chivalry. The Indian Wars, Mexico City, Vera Cruz, Luzon, Northern France, Rhineland, and the Gulf War are but a few of the glorious battles and campaigns fought by determined cavalymen. Yet, despite the richness of the legends, stories, and historical documents, the artillery support is not mentioned.

When did the cavalry receive its first artillery piece? What has been the evolution of regimental cavalry artillery, known affectionately as “Cavarty?” What role did Cavarty play in Operation

DESERT STORM? And finally, what is the future for Cavarty?

## The Beginning

The separate howitzer batteries within the three current armored cavalry regiments can trace their origin back to World War II. LTC (Ret.) Preston Utterback, former commander, 43rd Squadron, 3rd Cavalry Group, was one of the primary advocates of organic cavalry artillery. He modified the role of the M8 assault gun and turned it into the cavalry’s first organic piece of artillery hardware. The following excerpt is his account of the origin of what is now Cavarty:

“In the summer of 1943, I attended the Mechanized Cavalry School at Fort Riley, Kansas. Our tactical instructors were fresh from combat in North Africa.

A former cavalry squadron commander in North Africa told us then (among other things) to teach the assault gun troops how to fire indirect fire, if possible. Upon assignment as the S-3 of 43rd Squadron, 3rd Cavalry Group, I learned that our assault gun troop had a few ex-horse cavalry officers and NCOs who had absolutely no concept on training in artillery fire methods. They had only been instructed how to fire direct fire with their 75-mm howitzers mounted on an M2A1 tank chassis. I gained the cooperation of the com-

manding general of a field artillery brigade and was assigned several artillery officers and NCOs for training in indirect fire procedures. During an intense three-month period, E Troop, 43rd Squadron, 3rd Cavalry Group, transitioned from horse cavalry soldiers to artillerymen.

"We were committed to combat in August 1944. I shall never forget our first encounter with dug-in German 88 guns and tanks. We countered with frontal fire, called for indirect fire from our assault gun troop, and sent a recon troop around the left flank. They dropped those 75-mm HE shells with pinpoint accuracy and destroyed enemy equipment and personnel far beyond our expectations. We used this strategy time and time again in the next nine months we spent in combat.

"To my personal knowledge, our assault gun troop never fired direct fire at the enemy. We thought of them and used them as artillery only, and we used them constantly. They were OUR artillery, used to influence OUR battle objective and were always there when WE needed them."

### The First Transition

During the postwar years, the Army extensively studied the wartime operations of the mechanized cavalry groups. The military leadership determined that the cavalry structure was not adequately equipped and organized for offensive or delaying operations against a superior force. The reorganization in 1948 structured the armored cavalry into regiments, self-sufficient tactical units capable of operating independently over a wide area and at great distances from other units. In order to accomplish their new mission, the armored cavalry regiment consisted of three armored cavalry reconnaissance battalions, each composed of three reconnaissance companies, a tank company, a headquarters

and headquarters company, and a howitzer battery. This restructuring was the official birth of Cavarty.

Since the new reconnaissance battalions operated at extended distances from supporting artillery units, the organic howitzer battery furnished internal fire support. The battery had six self-propelled M52 105-mm howitzers, which were built on a tracked chassis. The howitzers were capable of matching the tank's cross-country mobility, and had a range of 11 kilometers. With new equipment and a new structure, the modern armored cavalry waited to test its strength. Despite Korea, the armored cavalry regiment, complete with its Cavarty, was not battle tested until the deployment of the 11th ACR to the Republic of South Vietnam in early September 1966.

### Vietnam

When the 11th ACR went into combat in the Republic of Vietnam in 1966, the howitzer battery was an integral component of the squadron structure. The batteries primarily supported squadron-level operations out of fire bases in the Tay Ninh, Binh Long, and Binh Duong Provinces. The squadrons used their battery fires primarily in suppressing and interdicting enemy activity. Occasionally, the fires were augmented by units from II Field Force Artillery.

The most significant field artillery improvement made within the Cavarty during Vietnam was the creation of the Regimental Fire Support Element (RFSE). The artillery cell's role was fire support coordination and clearance of fires. Rotating field artillery battalions had previously provided those functions for the ACR. The new RFSE thus enabled the 11th ACR to become independent in artillery operations.

The cavalry bond to its artillery in Vietnam was as strong as it was during WWII. Once again, the artillery was the

squadron commander's immediate asset to influence the cavalry battle. In Operation FISHHOOK, MONTANA RAIDER, and others — time and time again — the howitzer batteries responded with accurate and timely fire when the cavalry troops needed it. As COL (Ret.) Don McKnight, a squadron commander with the 11th ACR in Vietnam, summed it up: "It was the classic combined arms team. The battery was able to fire more missions in a timely and accurate manner than other non-organic artillery assets. The howitzer battery was MY artillery."

### DESERT STORM

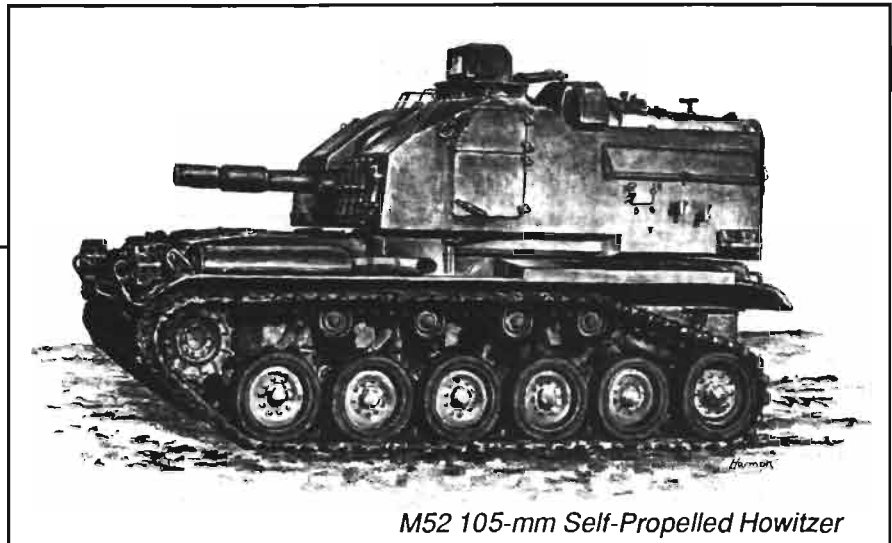
During the post-Vietnam period, the ACRs went through another transition. The AirLand Battle Doctrine brought the realization that the cavalry regiments needed additional artillery support from a direct support FA battalion while in the covering force area. In some cases, such as in Europe, the relationships between the cavalry regiment and its DS FA battalion were immediate and survived the test of time. However, with the 3rd ACR, the formal link-up with a direct support FA battalion did not occur until 1990. The 3-18th FA Battalion, a general support battalion from III Corps Artillery at Fort Sill, was designated the 3rd ACR's direct support FA battalion for DESERT SHIELD and DESERT STORM. Both units were preparing for a mutual NTC rotation when Operation DESERT SHIELD began.

When the two units linked up in Saudi Arabia in mid-October, the 3-18th FA Battalion came under the control of the 212th FA Brigade. Under the DESERT SHIELD OPLAN, the battalion had the mission to provide direct support to the 3rd ACR only in the covering force area. The 3-18th FA Battalion was attached to the 3rd ACR under the OPLAN for DESERT STORM. Under the attached relationship, the DS battal-

ion commander became the regimental FSCOORD. One of his first actions as the FSCOORD was to try to assimilate the Cavarty howitzer batteries under his command and control, a move vehemently blocked by the squadron commanders.

Based upon the diversity of cavalry missions, the regimental commander agreed on the following artillery relationship. During fast, fluid, and long distance offensive operations, the Cavarty howitzer batteries would remain organic to their respective squadrons. The FA battalion would move behind the lead squadron of the regiment and provide supportive fires for those targets and missions too large for the separate batteries and one squadron to attack. The howitzer batteries would remain OPCON to the battalion on short offensive operations and when massed fires were planned to prep an objective and close limits of advance were established. In the defense, or when massed fires were critical, the Cavarty howitzer batteries would be OPCON to the FA battalion. The regiment and the 3-18 FA Battalion would always keep the cavalry howitzer batteries operating in their respective squadron's zone of operation.

The problems that arose were immediate and difficult to resolve before DESERT STORM. First, the Cavarty battery FDCs were not familiar with TACFIRE and were untrained in 3-18th FA Battalion operations. Second, the three separate Cavarty batteries had their own different SOPs and standards. Third, being fiercely independent, the Cavarty batteries resisted any change or attempt at standardization. Fourth, the fire support structure for calls for fire was changed to fit the new relationship. Finally, the field artillery suffered from training distractions from separate higher headquarters, resulting in a lack of combined training. This was kept to a minimum.



*M52 105-mm Self-Propelled Howitzer*

Despite these problems, the 3-18th FA Battalion and the Cavarty howitzer batteries worked out most of the problems by the time DESERT STORM began. Multiple live-fire exercises (LFXs) in November and December helped work out some of the inherent problems. During these LFXs, the battalion TACFIRE team assisted each Cavarty battery FDC, and the entire fire support net was reconstructed and confirmed. In addition, SOPs were standardized across all six firing batteries for the first time.

During the initial phase of DESERT STORM, the three batteries remained OPCON to the FA battalion. The 3-18th FA Battalion followed the lead maneuver squadron and traveled in a battalion wedge formation. The Cavarty howitzer batteries moved with their respective squadrons. Under the movement plan, the 3-18th FA Battalion would fire from a battalion-sized "hip-shoot" configuration if enemy contact occurred.

Our action began as the regiment turned east and became the right flank of the 24th Infantry Division. Several close objectives were selected, each with limits of advance. The maneuver forces would consolidate on the objectives. As the regiment attacked the third set of objectives, the 3-18 FA Battalion had just completed a Q-36 counterfire mission and was in the process of moving all of the batteries forward to range well beyond the established limit of advance when the aviation squadron requested immediate targets considerably forward of the limit of advance. The

RFSE quickly determined that all available artillery assets to the regiment were on the move. An earlier decision not to shoot a prep, due to the large number of pipelines with unknown gas, required all guns to be prepared to mass fires on the objective as the squadrons closed on targets of opportunity. Luckily, the maneuver elements never requested actual fire missions during that critical period until the guns were positioned well within range of the targets.

As the 3rd ACR continued its movement to the east, the batteries reverted to their organic status. Because the regiment moved with two squadrons abreast, the 3-18 FA Battalion moved centered behind these two squadrons, with the third line squadron following behind, bringing with it the Cavarty's third howitzer battery. Due to communication constraints and distances involved with the movement, that third howitzer battery acted as a reserve, which is not a normal artillery role. When hostilities ended, and the regiment stopped moving, the 3-18th FA Battalion was in a position to provide fires in the entire regimental area of operations, while the Cavarty's third howitzer battery was still with its squadron but in position to augment fires in support of the two lead squadrons. That is how the situation remained until the 3rd ACR was ordered out of Iraq and moved back into Saudi Arabia.

As the two units left Saudi Arabia, the 3-18th FA Battalion went in one direction, and the regiment another. The field



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artillery officers shook hands and vowed to continue working on the relationship that had started in the desert. However, people rotate, the budget gets tighter, and the distance between Fort Sill and Fort Bliss remains a constant 620 miles. Future NTC rotations will undoubtedly continue to highlight the DS FA battalion/cavalry relationship as an area of weakness.

### The Future of Cavarty

Without detracting from the need to provide fire support to such an important maneuver element, let's examine artillery support options. I propose three viable options and include the conflicting viewpoints from previous cavalry commanders and FSCOORDs. I also list the strengths and weaknesses of each of the proposed options.

#### OPTION 1: Maintain status quo (separate Cavarty howitzer battery)

##### Advantages

This option has the full support of the cavalry commanders whom I interviewed for this article. COL Robert R. Ivany, the current 3rd ACR commander, summarized the maneuver perspective, "Organic howitzer batteries that always move with the squadron have proven to be the best solution." The most important advantage to this option is that it provides the squadron commander with his own organic artillery asset. When an artillery battalion becomes direct support to a squadron or to the regiment, the howitzer battery, in turn, becomes OPCON to the battalion. The squadron commander retains positioning authority over his battery when within his maneuver area. The squadron commander uses the artillery to directly influence his battle. The organic Cavarty battery is more timely in its respon-

sive fires, and is more knowledgeable of the peculiar needs and methods of its supported cavalry squadron. In addition, an organic Cavarty battery establishes an habitual relationship between maneuver and artillery, a relationship not seen anywhere else in the Army. The organic battery is larger than most other firing batteries. It has its own survey section, as well as an enlarged maintenance/recovery capability. The howitzer battery commander works independently of an FA battalion, and therefore becomes a more self-confident FA officer from his experience.

##### Disadvantages

Without an FA battalion, the FDCs of the separate howitzer batteries do not have the opportunity habitually to work with a TACFIRE system. As a result, they lack the training and equipment necessary to mass fires with a direct support FA battalion. The Cavarty howitzer batteries do not even have the capabilities or the training to mass fires with the other regimental batteries. If the offensive movement technique calls for two squadrons abreast, the Cavarty's third howitzer battery moves too far behind the battle to engage, and is delegated to a reserve status. Throughout an armored cavalry regiment, the three howitzer batteries have three different SOPs for doing things, and usually three different standards. Regimental standardization among the batteries is impossible because the artillery is divided among three squadrons.

The fast paced cavalry scenario usually forces the battery to operate from the "hip-shoot" configuration, or to operate in the split-battery mode. These movement methods either detract from timeliness of fire response or massing of fires. Additionally, field artillery officers do not usually occupy squadron-level staff officer positions. The only FA officer positions available within

the ACR are found in the Cavarty batteries or in the FSE at regimental and squadron level. The lack of available FA staff positions adversely affects FA officer transition and development within the Cavarty.

#### OPTION 2: Reorganize the organic squadron batteries into a direct support FA battalion within the ACR force structure.

##### Advantages

A command and control headquarters consisting of an organic FA battalion commander and staff would provide the regimental commander a higher level of expertise and training in artillery matters. A regimental FA battalion could position and move assets faster to allow continuous fire support to either a single squadron or to the entire regiment. It would create the ability, in most cases, to mass fires from three batteries. All three howitzer batteries' training in artillery matters would be coordinated, resulting in standardization throughout the regiment. The regimental FA battalion would also be responsible to coordinate the logistical support required for three howitzer batteries. Finally, habitual relationships, such as those currently used with aviation assets, would ensure familiarity with specific squadron operations.

##### Disadvantages

The squadron commanders and the regimental FA commander may disagree on field artillery utilization at the squadron level, causing disharmony. The squadron commander would lose HIS artillery. Personnel changeover within the firing batteries could become more frequent due to the increase of possible job assignments within the battalion.

*Let's keep all the good points that we now have with Cavarty and pick up the additional good points associated with an FA battalion (i.e. expertise, standardization, greater massing capabilities, more available tubes at all times, etc.)*

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**OPTION 3: Deactivate the organic squadron batteries.**

**Advantages**

It simply saves money at a time when the budget is getting tight.

**Disadvantages**

No habitual relationship would exist, and mutual training would not occur frequently enough to ensure proficiency. Cavalry operations are unique enough to require constant mutual training. As a corps asset, the cavalry would have to rely on slow moving and unfamiliar artillery units for its vital support. Most corps artillery assets do not have the equipment or personnel needed to support cavalry operations.

**Conclusion**

DESERT STORM demonstrated the awesome capability of the modern armored cavalry regiment with the M1A1 Abrams tank and the M3 Bradley Fighting Vehicle. Today's armored systems easily can outrun their current organic artillery at the squadron level. The Army seems committed toward keeping the current fast paced role of the armored cavalry regiment intact. Now, more than ever, the regiment cannot afford to operate without the continual protection of artillery support. Slow moving vehicles such as the FIST-V and M109 howitzer are not being upgraded to match the speed of the cavalry; therefore, the structure of Cavarty must adapt in order to keep pace with the modern battlefield.

The ACR must continue to have its vital organic artillery, but it needs to be from a regimental artillery battalion. Specific missions that require only one squadron to operate independently can

be supported by an habitual battery or batteries from within the battalion. The permanent artillery adviser to the regimental commander would be a more experienced and qualified FA officer, a lieutenant colonel vice a major.

The battery FDCs become better trained in battalion and TACFIRE operations. Field artillery officers and NCOs would have a greater opportunity for career progression and branch training. Finally, in future campaigns and battles, supporting artillery to the regiment would fall under typical artillery roles such as reinforcing and general support reinforcing. In a recent interview, LTC James Rowan, the 3rd ACR FSCOORD during DESERT STORM, gave his opinion of the future of Cavarty. "A field artillery battalion organic to the regiment, would provide better fire support to the regiment/squadron. The battalion would have greater flexibility, more cohesion, and better trained field artillerymen. It provides the best for the cavalry and the field artillery."

The current armored cavalry regimental fire support structure is by no means completely broken. However, Operation DESERT STORM demonstrated that modifications are needed. After every armed conflict, the cavalry has made slight adjustments to its methodology and structure. The period following DESERT STORM is the proper time for critical examination and the proposal of minor changes. Let's keep all the good points that we now have with Cavarty and pick up the additional good points associated with an FA battalion (i.e. expertise, standardization, greater massing capabilities, more available tubes at all times, etc.)

As the U.S. Army slims down in the future, the cavalry may not be afforded organic artillery at the squadron level. It may sound ironic, but an organic artil-

lery battalion at the regimental level may better survive the impending cuts. To a budgetary examiner, the FA battalion represents a complete, intact, and recognizable military entity. Three separate howitzer batteries may appear as "excess or unnecessary" to a non-cavalry politician or bureaucrat. The slight modification proposed represents a complete artillery support organization to the cavalry now.

Cavalry commanders, former as well as current, may resist and challenge my proposal. I am not advocating stripping the cavalry of its organic artillery. I am merely recommending a restructuring for future cavalry campaigns. Successes of the past do not guarantee success for the future. The armored cavalry regiments need to reorganize the separate batteries into a regimental field artillery battalion. I hope that I may once again serve with a distinguished armored cavalry regiment, but more specifically, in a Cavarty Field Artillery Battalion!

Captain Michael J. Reagor is a current student of the Dwight D. Eisenhower Fellowship Program for Leadership Development at the United States Military Academy, West Point, N.Y. His tours include two with the 3rd ACR, including Operation DESERT STORM, and one with the 6th Infantry Division (L). He was commander of C Battery, 5-11th FA at Fort Wainwright, and the 2/3rd ACR Howitzer Battery at Fort Bliss. He is a 1982 graduate of the USMA.

# Christie's Last Hurrah

## In 1941, the Army Reappraised the Christie Suspension For Use on Tank Destroyers

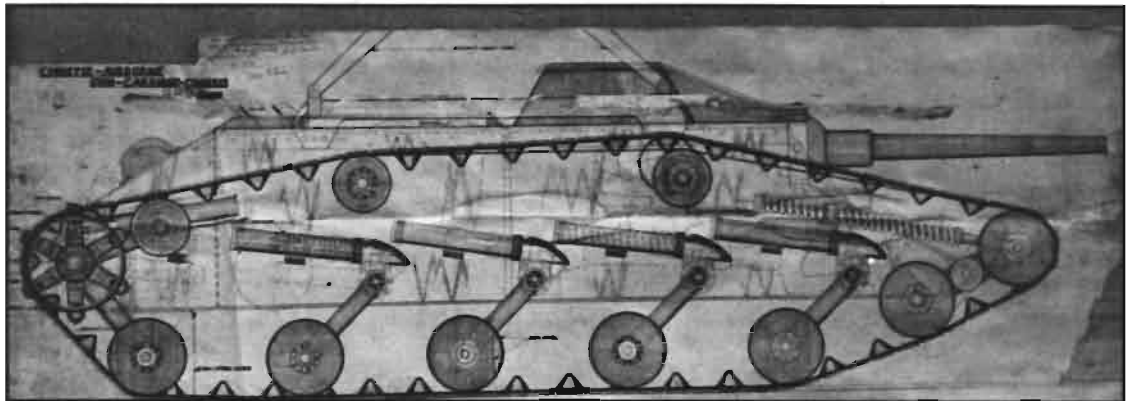
by George F. Hofmann, PhD.

As the U.S. Army entered World War II, its tactical and technical experts focused on a way to stop the tanks that spearheaded the German blitzkrieg. The doctrine that emerged created the Tank Destroyer Command and the need for a fast, maneuverable

vehicle capable of carrying a powerful antitank gun. This search for the "ideal tank destroyer" spurred reconsideration of the Christie suspension system, which the Army had explored and rejected in the 1930s, despite the fact that the system was adopted by the British and the Soviets.<sup>1</sup>

The Christie suspension, patented by the outspoken and cantankerous inventor J. Walter Christie, used helically-wound coil springs acting independently on each of the suspension's road wheels. While the Christie vehicles purchased for tests by the Army in the 1930s had not proven particularly durable, there was the potential for higher speed and maneuverability inherent in this type of design, something that was not possible in the volute-bogie type of suspension used in the American medium and light tanks of the day. Indeed, Christie himself had demonstrated the possibilities of his machines in numerous flashy public exhibitions backing up his boast that a tank could obtain high speed.

Two excellent recent studies of U.S. tank destroyer doctrine in WWII re-



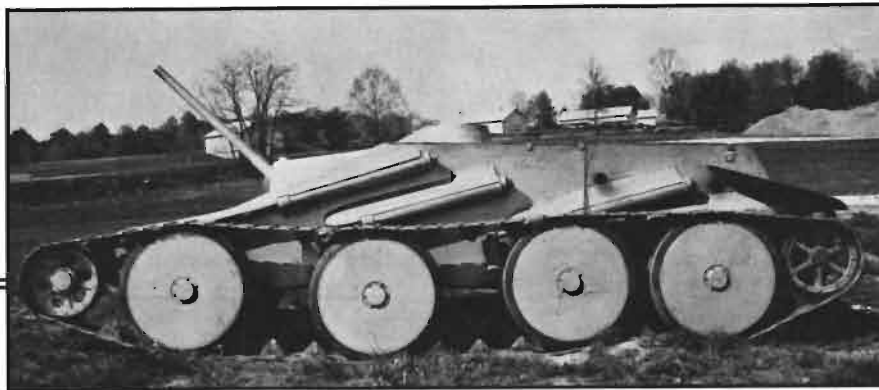
Christie and his son engineered this drawing of an airborne tank concept, developed during WWII. It clearly shows details of the coiled spring suspension.

count the struggle to come up with concepts and suitable vehicles to mount a defense against the German panzers and their tactics of blitzkrieg.<sup>2</sup> The concepts grew from the work of a special War Department G-3 planning staff appointed by General George C. Marshall in May 1941, under the direction of LTC Andrew D. Bruce. Charged to tackle "such unsolved problems as measures against armored force action," the group came up with the concept of a separate tank destroyer branch equipped with special vehicles. The doctrine, found wanting as the war progressed, determined that tanks would not fight tanks. Instead, tank destroyers would aggressively react to armor breakthroughs. At first, this new branch was equipped with towed guns and "portee" guns, field guns on halftracks, but soon the search continued for the "ideal tank destroyer."

The War Department planning group ultimately urged development of a lightweight tracked vehicle possessing speed and maneuverability, capable of carrying an adequate gun, and lighter than a tank, even at the expense of

some protection.<sup>3</sup> The group urged that in the search for more speed and maneuverability the Army reconsider Christie's independent coil spring suspension.

This recommendation was not welcomed by the Ordnance Branch, which had squabbled frequently with the strong-willed, eccentric Christie during tests of his designs in the 1930s. Ultimately, Christie sold his ideas to the British and the Soviets, who further developed the Christie suspension in two series of fast light tanks, the British "Cruisers" and the Russian BTs. Instead, the United States had continued to develop the volute-bogie system, which, despite its reliability, had by the 1940s begun to reach its developmental limits. Ordnance tests had proved that the volute-bogie suspension system used in all early U.S. Army tanks would not permit the desired speed and maneuverability.<sup>4</sup> Nevertheless, some Ordnance personnel were "bitterly opposed" to Christie's system. By December 1941, however, Bruce was able to get a memorandum from G-3 issued to G-4 recommending a 37-mm Gun Motor



The Bigley Gun Motor Carriage arrives for evaluation at Aberdeen Proving Ground in spring 1941. (National Archives)

Carriage using a Christie type suspension. This decision was influenced by observations made by LTC L.W.

Tharp, a G-3 General Staff officer from the Planning Branch and a strong supporter of the Christie design. In October he visited William Bigley, a private entrepreneur, who had acquired a Christie tank chassis. His report indicated the vehicle appeared to be an ideal self-propelled mount suitable for the TD Command and capable of mounting any gun smaller than the 3-inch antiaircraft gun. The following month, at Aberdeen Proving Ground, LTC Tharp inspected a British cruiser tank with the Christie suspension. He was impressed with the tank's smooth ride and stable gun platform, noting that its suspension system had been adopted by foreign countries. Based upon LTC Tharp's reports and observations, G-3 decided to develop the Christie concept into a TD. In January 1942, negotiations began between General Motors Corporation (GMC) and the Tank and Combat Vehicle Division of the Ordnance Department in order to study the details of Christie suspension patents controlled by Army Ordnance. Also considered in the negotiations was William Bigley, who had been in contact with General Motors regarding manufacturing rights of his acquired Christie chassis.<sup>5</sup>

It was not until the middle of March that action was finally taken: then-BG Bruce, who was dissatisfied with the numerous vehicles undergoing tests by the Ordnance Department, took the initiative and conferred with W.J. Da-

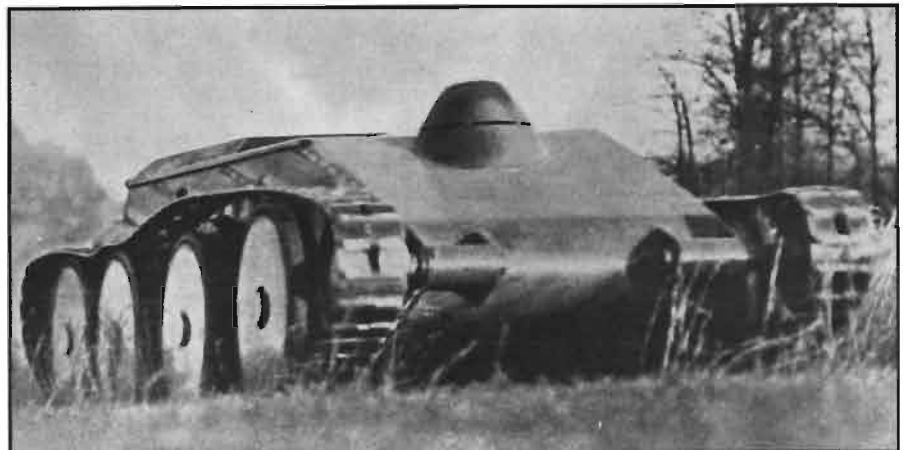
vidson of General Motors. Consequently, an engineer from GMC, Robert Schilling, designed a 37-mm Gun Motor Carriage with a modified Christie suspension.<sup>6</sup> Before the Ordnance Department could designate the proposed TD as the T42, it was redesigned early in April 1942 to mount a U.S.-made British 57-mm gun and redesignated as the T49. Two test vehicles were subsequently ordered from Buick Motors.<sup>7</sup>

Schilling's design deviated from the original M1928 and M1930/31 Christie suspension by replacing the large road wheels with smaller ones, adding track support rollers, and eliminating the forward bell-cranks. The modified design, however, did retain the long helical springs so characteristic of Christie's earlier vehicles. In an attempt to modify the wasted hull space due to the springs' position between

two spaced side plates, Schilling eliminated the outside plates on each side of the vehicle, exposing the long

helical springs.

In the spring of 1941, Bigley had unsuccessfully attempted to sell the War Department his acquired Christie chassis. The Aberdeen Proving Ground test indicated the tracked vehicle had a number of mechanical problems with the power train and the clutch-brake system of control. This chassis had a very interesting history. It was originally built by Christie and called the High-Speed Tank, Model 1937, 1938 and the T12, depending upon what year modifications were made. The vehicle was first tested in December 1937, and typical of Christie, he staged this test before the public, at Westfield Airport in New Jersey. An Ordnance Department observer was impressed with the "machine's very attractive appearance;" but in his opinion there were no new design features of striking importance. He concluded that the en-



Christie tank chassis M1937 is tested at Westfield, N.J. in December 1937. (Royal Armoured Corps Tank Museum)

gine would easily overheat with an added superstructure, armament and ammunition, and crew.<sup>8</sup> After the demonstration, Christie made arrangements to ship the tank chassis to Farnborough Proving Grounds in England for tests scheduled in February 1938. Then-LTC G. MacLeod Ross, who at that time was involved in tank design at Woolwich, remembered Christie's showmanship, describing him as "an escapee from Barnum and Bailey's circus...."<sup>9</sup> Another observer from the Royal Tank Corps, SGT A. Norris, recalled that during the first test-run attempt, the final drive seized up, bringing the chassis to a bruising, abrupt halt. This resulted in a number of damaged gear components; Christie's driver had forgotten to check the transmission oil. Christie was furious and refused assistance from his British hosts, preferring instead to acquire the replacement parts and fix the machine himself.<sup>10</sup>

Other than its speed, the chassis did not impress the British observers at Farnborough; they had purchased late in 1936 a Christie Model 1930, which was similar to the U.S. Army's Medium Tank T3 and the Combat Car T1. The British had already acquired enough technical information from this vehicle. Perhaps what soured the possibility of purchasing a second model was Christie's insistence that he receive \$320,000 to cover actual manufacturing cost of parts and drawings, and future manufacturing rights for current and future test models.<sup>11</sup>

Returning to the United States, and after a few modifications, the chassis — now called Model T12 — was again subjected to a brief test in October 1938 at Hempstead, Long Island. As before, an Ordnance Department observer was on hand to examine the vehicle. He noted that Christie's sus-



T49 57mm Gun Motor Carriage

Icks Collection: Patton Museum



T67 75mm Gun Motor Carriage

Icks Collection: Patton Museum

pension provided excellent riding qualities and a stable firing platform. However, there was again considerable concern regarding the effect the added weight of increased armor, armaments, and crew would have on the power train.<sup>12</sup>

In March 1939, Christie attended an Ordnance conference on tanks at which he virtually demanded the War Department let him undertake the construction of a large number of his tanks. If not, he threatened to use an organization of civilians he had and through which a sufficient number of Christie tanks would be furnished to each college in the United States for training. When asked to be more specific about his proposition and then submit it to the Chief of Ordnance, Christie left the conference, announcing he would first see President Roosevelt.<sup>13</sup> This was Christie's last official contact with the U.S. Army. He was not consulted in 1941 or 1942 by

GEN Bruce, COL Tharp, nor GMC engineers in regard to the modified suspension design for the TDs.

With no military customers and serious financial problems over an artisan's lien and attorney fees, Christie sold the chassis in August 1939 to William Bigley. It was destined to become the Bigley Gun Motor Carriage.<sup>14</sup> This vehicle was powered by a new 190-hp. Continental engine and new tracks. The late COL Robert J. Icks recalled Bigley bringing the vehicle — now sporting an open, odd-looking superstructure of mild steel — to APG in May 1942 for an unofficial proving grounds test. As during the previous spring, the chassis tested poorly and was returned to its owner. That was the last time Icks and APG saw the Christie/Bigley tank chassis.<sup>15</sup> Nevertheless, Bigley had been consulted by GMC officials regarding the Christie suspension but was advised that this system was being developed



by the Buick Division. In October, however, Bigley again attempted to interest a special Army Armored Board in his vehicle.

Though the Buick-designed T49 provided the mobility and maneuverability the TD Command desired, there were definite indications that summer that there would be a need to upgun the vehicle in order to enhance its firing power. In July, a decision was made to mount a 75-mm gun on the second pilot model, and by the fall, the vehicle was ready for proving ground tests. Meanwhile, a special Armored Vehicle Board (also called the Palmer Board) was created by the Army Ground Forces to deal with the various AFVs created as a result of America's entrance into the war, and at the same time attempt to place some semblance of order and control on the uniformity of equipment used by the using arms. The board, chaired by BG William B. Palmer of the Armored Force, considered some 15 vehicles between October and December 1942, including the Bigley vehicle and the T49. The first pilot T49, much to GEN Bruce's gratification, survived the board's scrutiny. While the board was in session, the redesigned second pilot T49 was redesignated in November as "75-mm Gun Motor Carriage, T67" with Christie-type suspension. The board concurred and recommended the T67 be further developed and implement "...changes as may be found necessary, with a view to standardization..." as soon as possible. However, Palmer had "serious misgivings" about Bruce's desire to develop a 76-mm gun motor carriage, and requested that he "take an 'antitank' role and give up the nimble hide-and-peek panther lines...." The Palmer Board believed in continuing the T49/T67 development with a 57-mm or 75-mm gun.<sup>16</sup>

On 30 October, Bigley offered his vehicle to the Palmer Board for an APG test, particularly as a potential



The rejected Bigley vehicle, as tested in 1942, and considered by the Palmer Board, with mock-up body. (Icks Collection: Patton Museum)

TD. The board deferred consideration of this vehicle until the T67, which embodied the modified Christie suspension in improved form, underwent its tests. Finally, on 20 November, the board members conferred with Bigley regarding serious concerns they had about his vehicle, based upon its past history. Consequently, on 24 November, GEN Palmer wrote Bigley and noted that, regarding his vehicle, "...no specific combat purpose has been stated: the body is not designed for any specific military purpose; and none of the requirements as to loading are met." By 4 December, the board made its final decision on the Bigley vehicle and unanimously recommended its consideration be terminated, because the vehicle "...could not be compared with carefully engineered military vehicles carrying their full combat loads." In addition, in the board's opinion, the Bigley vehicle's suspension was not much of an improvement over Christie's earlier models, and the T49 employed the same suspension in an improved form. None of the using arms represented on the board — the Armored Force, Cavalry, and the Tank Destroyer Command — were interested in development of the Bigley Gun Motor Carriage.<sup>17</sup>

Early in January 1943, two major events had a marked effect on AFV

designs.<sup>18</sup> First, the fourth and final change in the TD gun took place when the 76-mm replaced the 75-mm gun. Earlier in September, Ordnance had called to GEN Bruce's attention a new lightweight, high-velocity 76-mm gun. This new gun would provide the TD Center with a light, highly mobile, low-silhouette, lightly armored vehicle with the striking power of the 76-mm gun. Finally, GEN Bruce's perception of an ideal TD was achieved. The vehicle was designated "76-mm Gun Motor Carriage, T70," and eventually evolved into the M18 "Hellcat."<sup>19</sup>

The second and the most important technological change occurred when the Christie suspension was replaced by an Ordnance designed torsion-bar system. This suspension would have a dramatic impact on tank designs for many decades. The decision-making process for this action rested in the Subcommittee on Automotive Equipment, which formed recommendations on military characteristics and production capabilities and forwarded them to the Ordnance Committee for approval. On the subcommittee were members of the using services and Ordnance personnel, the Army's experts in tank design and engineering. The Ordnance Committee Minutes (OCM) recorded important information and references on developmental events. Three influential Ordnance

persons sat on the Subcommittee on Automotive Equipment when the decision was made at the end of 1942 to drop the Christie-type system and replace it with the Ordnance design.

The key subcommittee member was the chairman, BG Gladeon M. Barnes, who since 1938 had played a dominant role in Ordnance research and design. The second key committee member was BG John K. Christmas, an engineer and tank designer. The third member was LTC Joseph M. Colby, a protege of GEN Barnes. Both Barnes and Colby also acted as consultants for the Palmer Board. Later, General Colby claimed he was involved as early as 1933 in designing a torsion bar; however, he recalled, "I was never in the position to get funds for its development until the winter of 1942-3."<sup>20</sup> Instead, patents for the torsion bar were granted to Barnes and Warren E. Preston on 17 December 1935 and on 17 November 1936 to Barnes. It was Generals Barnes and Christmas who attended the Ordnance conference in October 1939 when Christie made his grandiose statement that he would provide his tank to every college in the United States and then stormed out of the meeting, claiming he was going to see the President.<sup>21</sup>

The decision to use the torsion bar in the T70 was made because previous experience with the Christie system demonstrated that the side-mounted, long, helical springs com-



After examining and rejecting Christie's coil-spring suspension, Ordnance decided to use the torsion bar system on the M18 "Hellcat" tank destroyer.

promised the space needed for the crew and fighting compartment, especially in light of the fact that the gun motor carriage was continuously up-gunned. The torsion bar layout did not compromise a most critical combat vehicle dimension, its width, and did not cramp the interior fighting space. The torsion bars were installed horizontally, extending across the underside of the vehicle behind the protection of an armor plate. In addition, it was demonstrated that the torsion bar had a greater shock-absorbing capacity than the modified Christie and the earlier designed volute-bogie suspension systems. Another concern that arose as a result of experiences with the Army's Christies during the 1930s was that the vehicle's wheels tended

to jump the tank tracks on turns. The torsion-bar suspension virtually eliminated this operating difficulty.<sup>22</sup>

Thus ended the U.S. Army's last attempt to use the Christie suspension. However, the confusion between the Christie and torsion-bar suspensions gave rise to mistaken identification. The official Ordnance Department History of World War II claimed this confusion accounted "...for much of the criticism of the Ordnance Department's rejection of Christie's design."<sup>23</sup> For example, when the first group of "Hellcats" arrived in England before D-Day, the CG of the 6th Armored Division, MG Robert W. Grow, noted, "...they are the M18 (old T70) 76-mm gun on Christie suspension."<sup>24</sup> During the Battle of the



Two Christie designs adopted by other countries - at left, the British Cruiser Mk III; above, a Soviet BT-series tank of the 1930s. (Icks Collection: Patton Museum)

Bulge, a III Corps Periodic Report, "Know Your Tanks," advised all units in the 4th Armored Division receiving replacement tanks that some "...with 76-mm gun...Christie suspension, low silhouette could be "...misidentified as German tanks. The report further cautioned all unit commanders to take serious note of this matter so friendly fire did not engage "our tanks of this type."<sup>25</sup>

Years later, the Chief of Ordnance during the war, LTG Levin H. Campbell, Jr., noted that he supported Christie and his designs early in the 1930s, until military requirements changed. He considered Christie a good inventor, "but like many such civilians, Christie felt he had to go it his way." Christie, according to LTG Campbell, expected Ordnance to use his designs, rather than accept military requirements.<sup>26</sup> Christie could not, nor would not, accept the committee approach to research and development that became so prevalent after World War I.

## Notes

<sup>1</sup>George F. Hofmann, "The United States' Contribution to Soviet Tank Technology," V125:1 *Journal of the Royal United Services Institute for Defense Studies* (RUSI) (Mar. 1980), Whitehall, London, pp. 63-8, and "The Troubled History of the Christie Tank," *ARMY* (May 1986), pp. 54-65.

<sup>2</sup>See Charles M. Baily, *Faint Praise: American Tanks and Tank Destroyers during World War II* (Archon Books: Hamden, Conn., 1983), and Christopher R. Gabel, *Seek, Strike and Destroy: U.S. Army Tank Destroyer Doctrine in World War II*, Leavenworth Papers No. 12, Combat Studies Institute, (USACGSC: Fort Leavenworth, Kan., Sep. 1985). Also see Baily, "Tank Destroyers," *ARMOR* (Jul-Aug 1979), pp. 7-13.

<sup>3</sup>Letter, MG Andrew Bruce to MG Orlando Ward, 28 Nov 1949, Folder: TD Development, Box: Tank Destroyer Center, The Andrew D. Bruce Papers, U.S. Army Military History Institute (USAMHI), Carlisle Barracks, Pa.

<sup>4</sup>Emory A. Dunham, *Tank Destroyer History* (not published), AGF Historical Study No. 29, 1946, Record Group 337, National Archives, Washington, DC, p. 53; Joseph E. Canning, "Faster Combat Vehicles: New Torsion-Bar Suspension Provides Greater Speed and Reliability," *Army Ordnance* (Jul-Aug 1945), Pat-

ton Museum of Cavalry and Armor, Fort Knox, Ky., pp. 94-5.

<sup>5</sup>Letter, Bruce to Ward, op. cit.; Memorandum, Office of the Chief of Ordnance, O.O. 472.1/3996 (G-3/46176), 2 Dec 1941, Record Group 156, NA, Washington National Record Center, Suitland, Md., and Subject: Visit to...the Bigley Tank, 22 Oct 41; Subject: Visit to Aberdeen, 13 Nov 41; Subject: Development of 37-mm Gun Motor Carriage with Christie Suspension, 3 Jan 42, G-3/46176, War Department General and Special Staffs, Record Group 165, NA.

<sup>6</sup>*Tank Destroyer History*, op. cit.

<sup>7</sup>Subject: 57-mm Gun Motor Carriage, T49 - Development Recommended, Ordnance Committee Minutes (OCM) Item 18039, 9 Apr 1942, RG156, NA.

<sup>8</sup>Subject: Christie Convertible Chassis, O.O. 451.25/7384, 15 Dec 1937; Subject: Demonstration - Christie Tank, O.O. 451.25/7385, 16 Dec 1937; Subject: Resume of Data on Christie Tank for use in "Hearings," O.O. 451.25/7467, RG156, NA.

<sup>9</sup>G. MacLeod Ross, *The Business of Tanks* (Elms Court, England: Arthur H. Stockwell Ltd., 1976), pp. 147-9.

<sup>10</sup>Letter, A. Norris to Col. Peter H. Hordean, 23 Nov 1970, Royal Armoured Corps Tank Museum, Bovington Camp, Wareham, Dorset, England.

<sup>11</sup>A.13. E1, E2 and E3: Notes on Development, ND; Letter, W. J. Christie to War Office, 28 Feb 1938, Royal Armoured Corps Tank Museum.

<sup>12</sup>Report of Inspection of Christie Tank at Hempstead, L.I., O.O. 451.25/8209, 10 Oct 1938, RG156, NA.

<sup>13</sup>Subject: Conference on Christie Tank, O.O. 451.25/8674, 16 Mar 1939, RG156, NA.

<sup>14</sup>AGREEMENT, 7 Aug 1939, between CHRISTIE CHASSIS, INC., ...and William Bigley, J. Edward Christie Files.

<sup>15</sup>Letter, Col. Robert J. Icks to author, 18 Aug 1977.

<sup>16</sup>Subject: 75-mm Gun Motor Carriage T67 (Based on 57-mm Motor Carriage T49 Chassis) - Development and Manufacture of Pilot Vehicles Recommended, OCM Item 19185, 10 Oct 1942; Minutes of the Ordnance Committee Meeting No. 51, 19 Dec 1942, all RG156; "Report of Special Armored Vehicle Board" and Exhibit J, AG451, dated 13 Oct 1942, submitted 5 Dec 1942, Records of the Adjutant General's Office, RG407, NA; Letter, BG W.B. Palmer to BG Andrew Bruce, 9 Dec 1942, and Letter, BG Andrew Bruce to BG W.B. Palmer, 26 Jan 1943, Bruce Papers, USAMHI.

<sup>17</sup>"Report of Special Armored Vehicle Board," op. cit., Exhibit O.

<sup>18</sup>Minutes of the Ordnance Committee Meeting No. 1, 7 Jan 1943; Subject: 76-mm Gun Motor Carriage T70 (Based on 75-mm Gun Motor Carriage T67 Chassis) - Development and Manufacture of Pilot Vehicles Recommended, OCM Item 19438, 4 Jan 1943, RG156, NA.

<sup>19</sup>Extracts of Chapter IX, *The Tank Destroyer Board, Tank Destroyer History*, 1 Dec 1941-1 Sep 1943, Bruce Papers, USAMHI, pp. 2-3.

<sup>20</sup>Letter, BG Joseph M. Colby to author, 27 Feb 1970.

<sup>21</sup>Conference on Christie Tank, 16 Mar 1939, op. cit.

<sup>22</sup>Canning, "Faster Combat Vehicles," op. cit.; Constance McLaughlin Green, Harry C. Thomson and Peter C. Roots, *The Ordnance Department: Planning Munitions For War* (Washington: G.P.O., 1955), fn 106, p. 200. For a detailed description of the T70 suspension see Chapter 3 "Suspension" in War Department Technical Manual TM 9-1755B, 29 Jan 1944, Patton Museum of Cavalry and Armor.

<sup>23</sup>*The Ordnance Department: Planning Munitions For War*, op. cit. p. 200.

<sup>24</sup>Interview, author with MG Robert W. Grow, Retired, 17 Aug 1971; Grow Diary, 22 May 1944, Falls Church, Va.

<sup>25</sup>6th Armored Division G-2 Periodic Report #108, 28-29 Dec 1944, Archives Branch, USAMHI.

<sup>26</sup>Interview, author with LG Levin H. Campbell, Jr., 18 Aug 1973, Annapolis, MD.

Dr. George F. Hofmann is a businessman, historian, lecturer, and author who served in U.S. Armor in 1957-59. He holds a BS degree in business administration and a masters in education and a masters in American history and a doctorate, concentrating in diplomatic and military affairs, from the University of Cincinnati, where he is currently a lecturer. A number of his articles have appeared in *ARMOR*, and he has also published in *Army, Marine Corps Gazette, Military Affairs*, and the *Journal of the Royal United Services Institute*. He is the author of *The Super Sixth*, a history of the 6th Armored Division, and soon to be published by Kent State University Press, *Cold War Casualty: The Court-Martial of Major General Robert W. Grow*.

# Add 200 and Fire for Effect

by Captain David L. Link and First Sergeant Anthony Hafer

The major reason why armored crewmen find it difficult to call for and adjust indirect fire is that most units cannot conduct sustainment training cheaply and with the necessary frequency to maintain these perishable skills. Without a doubt, live fire training is the best way to conduct this training, but resources are so scarce that only forward observers and key leaders usually get this opportunity.

The Tactical Simulator Forward Observer (TSFO) is another excellent training method. TSFO is a computer operated training device that projects a picture of a landscape with targets on a movie screen. The simulator shows the forward observer the impact of the rounds bursting in the area. Unfortunately, the TSFO is a large, expensive machine set up in a permanent location and manned by school-trained personnel. The main drawback is that it gives the soldier an oblique, two-dimensional view of the battlefield. This makes it difficult for some soldiers to transition from this two-dimensional view to three dimensions on the ground.

So here is the challenge: create a system to instruct or sustain training in calls for fire that is realistic, effective, easily resourced, and easily adapted to any training location.

The most logical starting point is the training manual that establishes the tasks, conditions, and standards. This is STP 21-24-SMCT *Standard Manual of Common Tasks*, task 061-283-6003 (Call for and Adjust Indirect Fire). The best reference for instruction is FM 6-30 *Observed Fire Procedures*. By using this task as the foundation for training, the guidelines for execution are now clearly established.

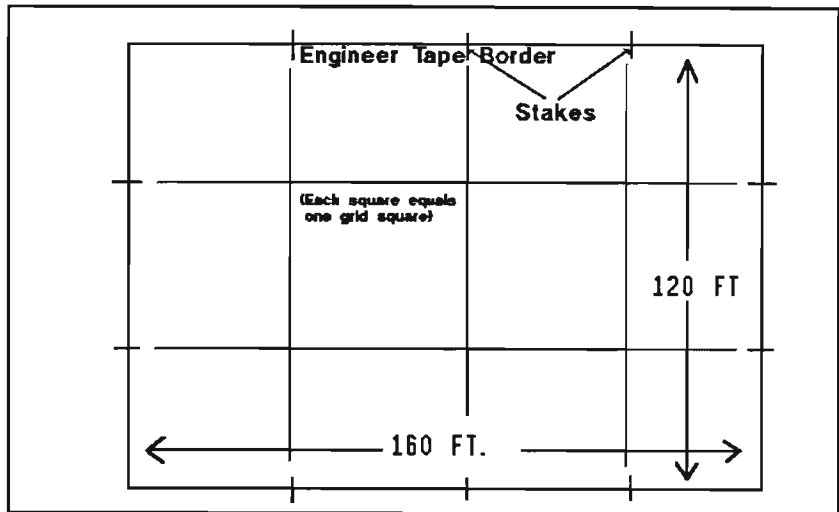


Figure 1. Engineer tape and stakes mark off outer grid lines. Scale is 1 foot to 25 meters.

Now, consider the average area a soldier can observe. For purposes of this exercise it is best not to exceed an area of nine grid squares. This consideration is directly linked to the area suitable to set up the terrain model, which needs to be large enough to give the feeling of observing actual terrain, and also completely visible from the observation post. The scale of one foot to 25 meters is used. This makes it big enough to be realistic, but small enough to be put indoors when necessary. If expanded to 160 feet wide by 120 feet deep, it could provide a surface large enough to train the entire tank crew individually at one time.

The terrain model boundary is marked off on the ground using engineer tape to represent the outer grid lines (See Illustration 1). One of these grid lines needs to be oriented to Grid North so that the soldiers can use their compasses during training. Now, either create a fictional map, or use a real map to design the terrain model. It is easier to create a fictional map when limited resources are available.

However, for additional realism, the terrain model can be designed to recreate a unit's General Deployment Position, or any of the much fought over terrain of the National Training Center. This not only trains the soldiers on calling for fire but also familiarizes them with terrain on which they may actually have to fight.

Roads and streambeds can easily be created on the terrain model with a shovel or "weed eater." Buildings should be built to a scale of 1/16 inch to 1 foot. Sandbags can substitute for hill masses or additional relief. Shrubs, foliage, or branches can represent forested areas.

The scale of the terrain model most closely approximates 1/72; buildings and vehicles from HO model railroads can suffice.

Two graders are required for each soldier tested.

Grader number 1, the scorer, times the event and grades the soldier on a checklist from the ST 24 CTT manual.

Grader number 2, the range operator, plots the location of the target and the

impact of each round using the data transmitted by the soldier to the FSE, and answers as the FSE.

The soldier may use any of the three methods to bring effective fire on the target: "Grid Coordinate," "Polar Plot," or "Shift from a Known Point."

**Method of Operation:**

Although all three methods of target location can be used, I will describe the "shift from a known point" method. Tankers favor this method, and if you understand how to use it, you will be able to use the other two methods.

The soldier to be tested (now called the observer) is located at one of the OP positions on the base line of the course. We will use OP#2.

Once again, the more realistic the OP position, the better the training. The soldier, with a map, protractor, binoculars, and a compass, receives his unit call sign, the Fire Direction Center's (FDC) call sign, and the locations of the Target Reference Points (TRP), and observes a target.

From this position, he can see the reference points on the course. (TRPs 1, 2, and 3.) He is given a target in the vicinity of a TRP, in this case, three tanks in the vicinity of TRP 2.

He starts his initial Call for Fire with the warning order. He calls the firing unit, identifies himself and the method of adjustment he will use. (For the firing unit, we will use A 64, and for the observer, T10).

This is how the warning order would sound: "Alpha 64, this is Tango 10, adjust fire shift from TRP 2."

Direction: The observer determines and transmits the direction from his position to the target, the observer-target line (OT Line). He now must calculate and send the shift by determining the distance from his position to both the target and the TRP, then subtracting the smaller from the larger. If the distance from the observer to the target is less than the distance from the observer to the TRP, then the range adjustment would be a "drop." If the opposite were true, then it would be "add."

Now, he must determine the lateral shift. The lateral shift is the distance at a 90-degree angle from the OT line to the TRP. This can be determined by using the mil angle relationship formula  $\frac{W}{RX}$  in which:

- W = The width of the target in meters.
- R = The range in 1000 meters.
- X = The mil angle between the two points.

The last part of the order is the target ID, in this case, three tanks stationary in the open.

The range operator locates the target in the same way that the firing unit would, except that he does it on the course layout rather than on the map.

The range operator goes to the TRP and determines a line at the same mil angle as the OT line that the observer transmitted to him. This line is drawn through the TRP and the initial measurements to locate the target along or at a 90-degree angle from it. He now measures the range and lateral shift using the measuring stick (see Figure 2). He places the first tip of the device at the TRP and the second tip on the line in the direction he wants to measure. He then picks up the first tip and rotates the device 180 degrees on the second tip so that the first tip is again on the line. Because the device is a scale 100-meters wide, he has now measured a distance of 200 meters. This process is repeated in the same manner to equal the distance to be measured.

This distance is the range change. Once he has measured the distance, he turns the device 90 degrees in the direction that he wants the lateral shift and measures that distance in the same way. He now is at the target lo-

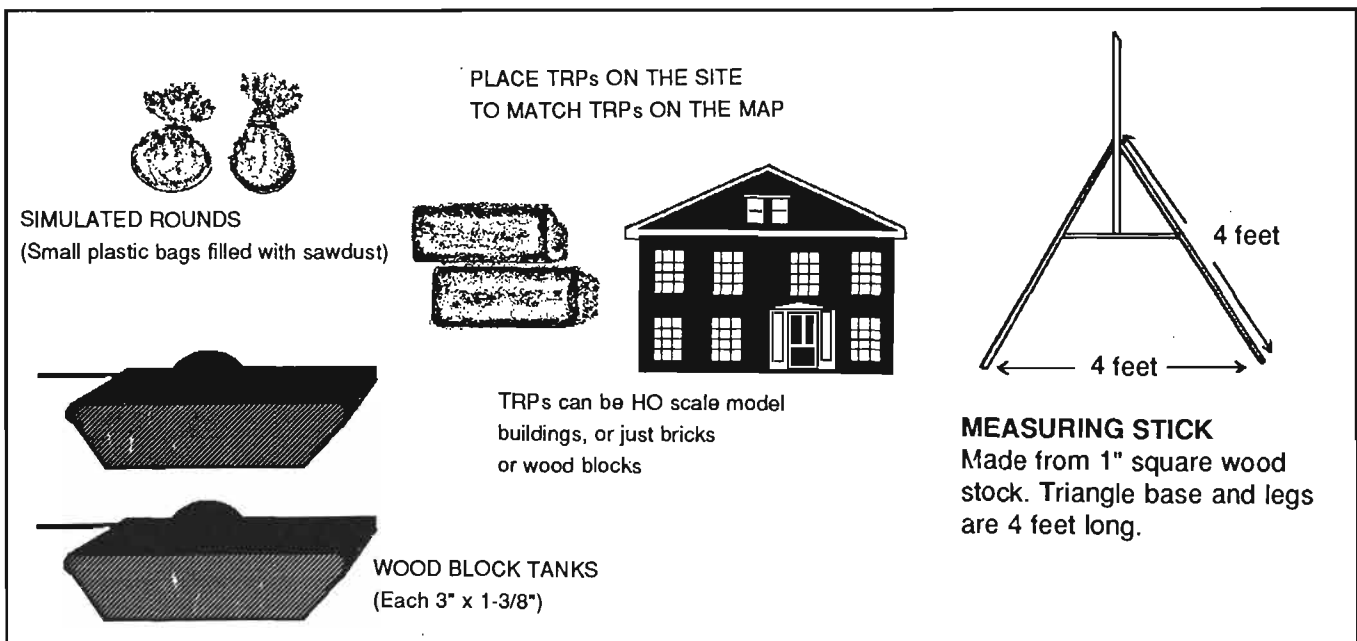


Figure 2. Most of the necessary equipment can be made easily.



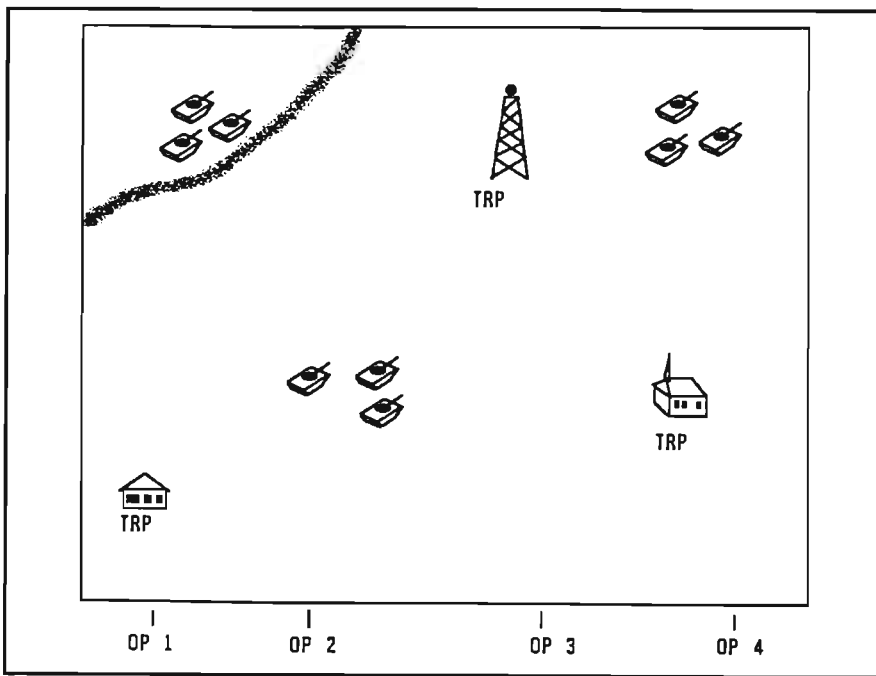


Figure 3. A course layout with four OPs.

cation, as transmitted to him by the observer.

At the target location, the range operator drops a simulated round, and announces "SHOT, OVER."

The observer announces "SHOT, OUT," observes the location of the first round in relation to the target and transmits an adjustment if necessary.

The range operator now determines a line at the same mil angle as the OT line but through the point of impact of the first round. This is now the OT line. Using the data transmitted to him by the observer, he measures the range and lateral shift and drops a second simulated round.

The observer continues to call adjustments, and the range operator continues to plot the location of the rounds until a round has impacted within 50 meters of the target, at which time the observer calls "FIRE FOR EFFECT." The range operator then drops about five simulated rounds. The observer observes the fire, refines and calls another "FIRE FOR EFFECT," if necessary, and then calls "END OF MISSION" and sends the results of the fire to the firing units.

The soldier is evaluated on his ability to locate the target, by the method in which he chooses to adjust fire, by

his bracketing, and by his ability to assess the results of the fire. All standards used are from STP 21-24-SCMT.

The equipment used in this method is either readily available or easily constructed. It can also be stored in a reasonably small area.

The time to set up the course is about one hour. A soldier can be trained in about 30 minutes. If used as part of a skills test, a soldier can be tested in 10 minutes. Of course, more than one soldier can be trained or tested on the terrain model at the same time.

This method solves many of the problems of teaching Call for Fire and can be made as interesting as the instructors' imagination will allow. It was originally designed as a method to evaluate students of the Armor Officer Basic Course during Tanker Stakes. Tanker Stakes is a kind of "final exam" for this course in which students are tested on the combat critical skills they learned, and is executed by the 2d Squadron, 12th Cavalry. The architect of this method is 1SG Anthony Hafer, the first sergeant of A Troop, 2-12 Cavalry, and is affectionately known as the Hafer Method.

Captain David L. Link was commissioned in Armor in 1984 from California State Polytechnical University. He has served as a tank platoon leader, tank team XO, and adjutant for Task Force 2-8 Armor at Fort Carson; and as squadron S3 and troop commander with 2-12 Cavalry at Fort Knox. He has attended AOB, AOAC, ITV, and NBC Schools. He is currently assigned as the commander of A Troop, 2d Squadron, 12th Cavalry Regiment, administering to the Master Gunner Courses, the Armor Officer Advanced Course, and the Cavalry Leader Course.

First Sergeant Anthony Hafer joined the Wisconsin National Guard in 1964 as a tanker. During the next seven years, he worked as a mortarman, radio operator, and demolition specialist. In 1972, he entered the Active Army, again as a tanker. He served in 4-69 Armor in Germany; as a drill sergeant in 4th Training Brigade, Ft. Knox; as battalion assistant operations sergeant in 4-73 Armor in Germany; as a drill sergeant in 1st Armor Training Brigade, Ft. Knox; as brigade assistant operations sergeant in 1st Brigade, 1st AD; and as operation sergeant, Command and Staff Department, USAARMS, Ft. Knox. He is currently first sergeant of A Troop, 2d Squadron, 12th Cavalry Regiment.

# Company D (Mobile Combat Range)

by Lieutenant Colonel Thomas R. Rozman

## Introduction

The contingency operations (CONOPS) battlefields of the future may be emerging as a "new base case" for Army thinking and planning. The recent Southwest Asia (SWA) crisis might have been our first experience with this new orientation. Deployment of substantial forces to a theater with minimal training support infrastructure may be typical of these future operations. If the forces deployed have significant heavy force elements (armored, mechanized, or motorized forces with organic large caliber weapon systems, such as direct fire missiles and guns), and initial commitment to the theater of operations is followed by a prolonged presence before combat begins or political solutions are found, how does the deployed force sustain gunnery proficiency to battle standard?

Lacking live fire ranges for guns and missiles might compromise readiness. But even when there is ample and available land for gunnery in the theater, lack of targets and instrumentation to obtain critical performance feedback could result in expensive ammunition going down range with little training value.

The mobile combat range (MCR) might offer a solution, using existing and emerging technology and hardware. This article discusses how such an asset might work, using the device of a hypothetical MCR unit and a CONOPS scenario. The scenario assumes use of gunnery training strategies that are part of the Army's Combined Arms Training Strategy (CATS), and assumes that a significant portion of any projected gunnery

sustainment training employs a COFT-like simulator with a performance gate that must be met before allowing soldiers to expend expensive ammunition on a range. Ideally, the simulator would be mobile and, in future, would be embedded in the weapon system. Combining the mobile ranges and the simulators to support any CONOPS gunnery sustainment training would provide a powerful readiness multiplier, but even the MCR by itself might provide an 80 percent training solution. Its only drawback would be added consumption of spare parts and petroleum products, which might be scarce or limited in theater.

## Scenario: Operation SOUTHERN CALM

The UN military response followed a deterioration in the political stability of an African region vital to the United States and other industrial powers for its resources and markets. The appeal for UN help came from several smaller states in the region, each major sources for the world's reserves of a number of essential industrial resources. They saw a threat to their territorial integrity when a group of neighboring states became increasingly bellicose in their pronouncements regarding their smaller neighbors and the disposition of their valuable raw resources. The crisis worsened when forces from two of these states entered a border zone that had been created as a demilitarized buffer region. The occupation was carried out by a force of about two divisions of armored and motorized forces, backed up by more than four

infantry divisions. This combined force was now ideally positioned to invade and occupy the territory of the militarily weaker neighboring states.

Both of the offensively poised armies had been involved in active operations in recent years, though not against competent heavy or mechanized forces. Their ability to operate such forces effectively and sustain these operations was questionable. However, during the months preceding overt military activity, as the political situation deteriorated, both countries had made extensive efforts to bring their forces to a high state of efficiency. This was particularly true of the armored and motorized elements, and there was good reason for this: much of the border zone was ideal tank country, consisting of flat or rolling grasslands.

The situation was beginning to exhibit an eerie similarity to previous situations, most notably the initial stages of the Kuwait-Iraq experience. There were other similarities - the unanimous U.N. sanction response in the form of an embargo, and the formation of a force to assure border integrity. As in the previous situation, the U.S. provided a significant part of that force. The deployment and subsequent operation was termed Operation SOUTHERN CALM.

## The Genesis of Mobile Combat Ranges

Operation DESERT SHIELD had demonstrated the importance of pre-planned sustainment training. This need developed because deployed forces spent a long period in Saudi Arabia uncommitted to combat opera-



A problem in Saudi Arabia was range space close to unit cantonments. Here, tankers of the 82d Airborne practice on an improvised range early in the deployment.

tions. Effective sustainment training to maintain a high level of combat readiness and troop morale became critical.

Few ranges were available in Saudi Arabia, especially ranges convenient to unit cantonments. Units could, and did, obtain Saudi approval to work out areas in the desert as *ad hoc* ranges, but with no targetry or instrumentation, such ranges did not provide effective feedback to crews, platoons, and companies.

Returning to the SOUTHERN CALM scenario, Central Command and Training and Doctrine Command (TRADOC) jointly developed a solution to the requirement. It took the form of a mobile range complex, organized as a company-size unit, capable of deployment to any anticipated CONOPS theater.

The necessary technology, hardware and software to build such a capability had been maturing through several earlier TRADOC and Army Material Command initiatives, one of which was the Prime Range Project. The DESERT SHIELD experience had given the Army a focus for these efforts.

Through an expeditious development program, the Armor and Infantry Schools adapted their CATS baseline

gunnery training strategies to create a modified CONOPS version that provided a requirement definition for the mobile range. In cooperation with TRADOC's combat development community, the first experimental unit was formed a year and a half after DESERT SHIELD.

It was organized with the following characteristics:

- A company-size unit of forty personnel.
- One hundred percent air and ground mobile (all elements mounted on trucks).
- Reusable, mobile targetry (both static and "mover" targets designed to support precision laser and full service gunnery, and subcaliber gunnery.
- Targetry had a laser shoot-back capability.
- Mobile range control systems.
- Mobile instrumentation system.
- Mobile power source.
- Organic spare parts and maintenance capability.
- Necessary software.

The experimental unit spent one year working through a series of tests, deploying to combat training centers and Reserve Component sites and providing "instant" ranges on various kinds of terrain. Results showed that the experimental unit could successfully

move by air, rail, or road, deploying with other units, and quickly begin supporting on-site gunnery sustainment. The facility proved, time and again, that it could provide a level of support equal to the best fixed site facilities. In the case of units that deployed to locations with less capable ranges during the tests, the measurably improved performance of crews and platoons supported by the MCR was significantly better.

From these results, the Army decided to form and equip 15 MCR companies, based on a best assessment of projected CONOPS needs, anticipated peacetime employment, and competition for scarce funding in a constrained fiscal environment. Company D was part of this program.

### Activation of Company D and SOUTHERN CALM

Company D (Model Combat Range) was activated on 1 June 1994, at Fort Stewart, Georgia. The company, with two sister companies, immediately began supporting units of the 24th Mechanized Division. For the next year, the division and the companies experimented with and refined training strategies, deployed to different austere locations, and tested the MCR concept. The division learned that the MCR companies offered a flexibility that improved the quality of gunnery training for all gun and missile systems beyond anything previously known. The companies' ability to go virtually anywhere and reconfigure into almost infinite target arrays with unmatched feedback, were adding an edge to the 24th's battle readiness.

Much of this enhanced training was due to the mobility of the system and its precision laser capability. Units were able to make use of virtually every available training time window. Expedients, like a local range set up in the company area for platoon gunnery using the precision laser capabil-

ity, had become almost a division standard.

Thanks to this capability, the division's gunnery proficiency had reached a level previously unknown, and the ability of the division to deal more effectively with schedule dynamics and personnel turmoil had also significantly improved.

As upcoming events were to show, the pioneering work accomplished between the 24th Mech. and its supporting mobile range company was to repay the investment tenfold. They had worked out the basis for a flexible, deployable gunnery sustainment training system and established the essential elements of a significant combat multiplier.

### **Deployment to the Theater of Operations**

The 24th Mech. deployed to the SOUTHERN CALM theater of operations as part of a two-heavy-division contingency corps, replacing initially deployed light forces. Company D (MCR) deployed shortly after the division as part of its in-theater support package.

Because of various political initiatives, there was a standoff of several months between the U.N. forces and the forces of the threatening states. During this period, the 24th ID capitalized on the earlier work it had done with sustainment gunnery training, supported by Company D (MCR). The result was a smooth transition into orderly and systematic gunnery sustainment, and gunnery proficiency remained at a very high level.

During this period, the division adapted its sustainment training in light of intelligence assessments of the forces of the two threatening states, their tactics, organization, and equipment, and the terrain along the frontier. Company D's flexibility proved particularly useful. With its capability

to locate on almost any terrain and reconfigure, it was able to represent virtually any anticipated threat tactical display. The shoot-back capability further enhanced realism. As a result, crews and units reached a particularly high state of effectiveness in the unique conditions of the theater.

When the two threatening states later began military operations across the frontier, the initial engagements proved too costly to continue. The first two engagements, involving two armored brigades, were disasters, both brigades suffering losses in excess of 70 percent of their main battle tanks within two hours of contact.

This led to a reopening of negotiations and a subsequent withdrawal of aggressor forces to within their borders. Subsequent talks paved the way for more substantial diplomatic initiatives to restore an effective peace in the region.

### **Conclusion**

The preceding piece of fiction may strike some as a blinding flash of the obvious. However, it is interesting to note that the histories of most major armies are replete with rapid deployments to new theaters where early combat operations were anticipated but did not develop. Sustainment training during the resulting prolonged periods of non-combat before hostilities takes an understandable third or fourth place in planning priorities. But in today's world of complex weapons, it goes without saying that the battle efficiency of these weapons is vital to success. These systems imply extremely fast and large-scale losses for both sides, once engaged, so gunnery sustainment training strategies are essential. We should anticipate a sustainment gunnery training strategy requirement as the rule, rather than the exception — and plan for it.

Planning for deployment must concentrate on the perennial first order of business — getting there "fastest with

the mostest." But deploying armies have too often found themselves sitting for long periods with inadequate or nonexistent sustainment training capability and support. With older weapons systems, this was not an insurmountable obstacle. But our new, more sophisticated systems are less forgiving. We must plan to sustain training, particularly if the theater has minimal infrastructure. This article discussed one possible approach to this requirement, the mobile combat range.

In future contingency operations, we are uncertain who our foes will be. But unless we can put "steel on target," we will not kill the enemy.

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# Forward Command

## *The Wehrmacht's Approach To Command and Control in World War II*

By Major John F. Antal

*"The command and control system which supports Air-Land Battle doctrine must facilitate freedom to operate, delegation of authority, and leadership from any critical point on the battlefield. Plans are the initial basis for action, but commanders must expect considerable variation from plans in the course of combat."<sup>1</sup>*

France, 13 May 1940. The situation was desperate! The machine gun fire from the French positions on the west side of the Meuse River had stopped the German assault cold. Four times the men of the 2d Battalion, 7th Rifle Regiment, 7th Panzer Division, had tried to cross to the west bank of the Meuse River... four times they had failed. Most of the officers were dead or wounded. One company had managed to get across, but now it was stranded on the far bank and was taking heavy casualties. No one was willing to try again to cross under such withering French fire. Demoralized and stunned, the battalion hugged the cover of the east bank and waited.

A fast moving German staff car skidded into a position on the east bank, almost jolting its occupants out into a ditch. General Erwin Rommel, the division commander, climbed down a ravine, and asked the nearest soldier for the location of the battalion command post. Within minutes, Rommel took command of the 2d Battalion, 7th Rifle Regiment of the 7th Panzer Division. The fate of the entire division's attack depended on a rapid crossing of the Meuse.

Using the battalion's wireless equipment, Rommel organized direct fire support from several Panzer IIIs and IVs and a troop of artillery that he had been racing after him to this decisive

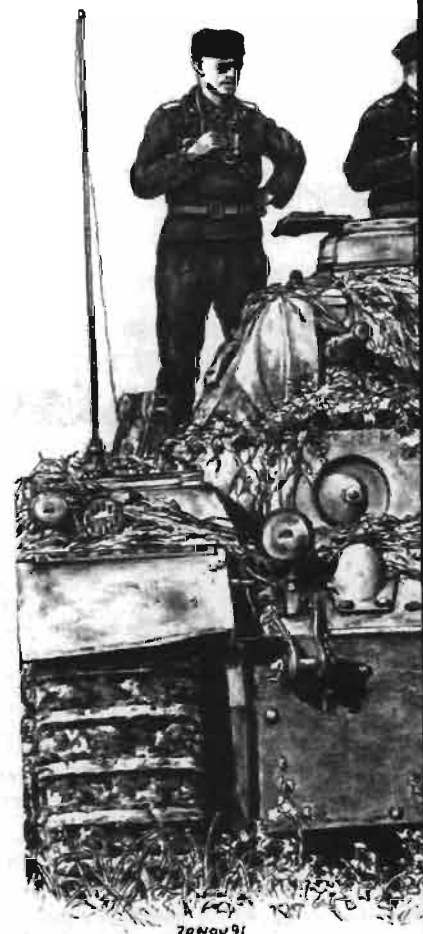
point in the division's attack. Under Rommel's direction the tanks began to plaster the French pillboxes with accurate direct fire. Organizing the battalion's assault teams, Rommel personally lead the 2d Battalion in a coordinated assault to cross the Meuse River. Soon, the enemy machine guns had been silenced by the tanks, and the assault infantry had forced the river in rubber rafts. Combat engineers soon began to construct a pontoon bridge. The next day, his 7th Panzer Division was racing to the west, prying open the Allied defense of France that would end with France's surrender and the evacuation of the British Army at Dunkirk.<sup>2</sup>

Rommel exercised an approach to command that was an important combat multiplier for the German Army. This approach, called "forward command," was the standard tactical command and control style in the Wehrmacht. The Wehrmacht believed that the "forward command" approach was an essential element to achieve tactical victory in mobile warfare. Forward command called for senior commanders to issue orders based upon personal observation and to assume command of a subordinate unit during a critical point in the fighting. The senior commander issued his orders based on direct observation and would actually assume command of a

lower formation or unit if necessary. Rather than stifling initiative, this system aided agility, initiative, and synchronization in the Wehrmacht. The purpose of this discussion is to describe the forward command approach employed by the Wehrmacht and highlight the importance of the forward command concept to German tactical success.

### **Agility**

The Germans did not believe in an orders-intensive, centralized approach to command and control. The doctrine of "blitzkrieg" demanded quick thinking leaders and decisive command. Forward command relied heavily on trained, thinking, independent leaders







and unflinching trust in subordinate officers to carry out the mission within the intent of the senior commander. This understanding permeated the Wehrmacht's approach to war.

*"The tempo of blitzkrieg calls for speedy and precise command, and its dynamic nature calls for anticipation. To achieve these, the operational and higher level commanders have to be forward, not only to see for themselves what is really happening, but to get the feel of the battle.*

*All one can add is that this command technique was not a gimmick of Rommel's, but was laid down in Guderian's training manuals for the Panzertruppen. As Manteuffel put it,*

*'I always located where I could see and hear what was going on in front; that is near the enemy and around myself — namely at the focal point'.*"<sup>3</sup>

The Wehrmacht expected its tactical commanders, division level and below, to lead up front, sense the situation, and take decisive action without waiting for permission or further instructions. The most junior leaders were expected to take decisive action, even if that action meant changing the original plan, as long as the decision was guided by the commander's intent. Commanders at every echelon expected their superiors to take personal command of their units in critical situations. In this fashion, the German commanders were able routinely to act faster than their opponents.

## Initiative

The essential core of the forward command approach was the subordinate commander's dedication to the senior commander's intent, combined with independent action. The senior commander issued his orders. These were completely binding on his subordinate leaders. Subordinate leaders could change the plan, act independently, and make their own decisions, if those decisions achieved the object of the commander's intent.

Inactivity was considered criminal. Leaders were expected to think and make decisions. All decisions, however, were expected to conform to the basic goal of the commander. "...the basic principal of the German com-

mand system in World War II was to always try to make the decision on the lowest possible level of command so that it could be made as quickly as possible."<sup>4</sup>

To the Wehrmacht, the commander's intent was not a reiteration of the scheme of maneuver. A scheme of maneuver was considered only one way, usually the initial concept on how to accomplish the mission. Initial concepts were usually based on the terrain and whatever information on the enemy that was forthcoming. As more information on the enemy was acquired, the subordinate was expected to act accordingly and secure the objective by the best possible means.

The subordinate leader was guided by an intent that explained the mission's object (desired end result), its importance (what will occur if the end result is not achieved), and the reasons (the desired end result will create the following situation). The understanding of this definition of initiative was vital to German tactical success. It provided the flexibility necessary to outthink and act faster than the enemy.

Furthermore, every commander was required to understand the intent of the commander two echelons above his level of command. This became essential in making independent decisions in the heat of battle, when senior commanders either could not be reached or not be reached in time. By clearly understanding the intent of the commanders two echelons above, a subordinate leader could use the senior commander's intent to guide his actions. Guided with this intent, he could make a more correct decision.

Field Marshal Erich von Manstein, considered by many historians to be the most gifted German commander of the Second World War, described how this process was able to work in his book *Lost Victories*: "The granting of such independence to subordinate commanders does, of course, presuppose that all members of the military hierarchy are imbued with certain tac-

tical or operational axioms. Only the school of the German General Staff can, I suppose, be said to have produced such a consistency of outlook."<sup>5</sup>

Allied propaganda often portrayed the Germans as unthinking automatons. A serious battle analysis, however, reveals that the soldiers of the Wehrmacht showed unbelievable initiative and excellent tactical leadership. Junior leaders were willing to take risks when risks were necessary. They consistently outthought their adversaries. More important, the overall German approach to command and control supported and nurtured these attitudes.

History proves that the thinking, independent minded tactical leaders of the Wehrmacht consistently outfought their opponents. That the Wehrmacht fought almost everywhere outnumbered, often in hopeless situations, and never disintegrated is a strong argument for the prowess of their tactical abilities. The forward command approach to command and control was a major reason for that success. Again, Von Manstein relates:

*"It had always been the particular forte of German leadership to grant wide scope to the self-dependence of subordinate commanders — to allot them tasks which leave the method of execution to the discretion of the individual. From time immemorial — certainly since the elder Moltke's day — this principle has distinguished Germany's military leadership from that of other armies. The latter, far from giving the same latitude to subordinate commanders on the tactical plane, have always tended to prescribe, by means of long and detailed directives, the way orders should actually be carried out or to make tactical action conform to a specific pattern. On the German side this system was considered a bad one. It would, admittedly, appear to reduce the risk of failure in the case of a mediocre commander. Yet it only too easily leads to the executant's having to act against the exigencies of the local sit-*

*uation. Worst of all, in its preoccupation with security, it waives the opportunity that may occur through the independent action of a subordinate commander in boldly exploiting some favorable situation at a decisive moment."*<sup>6</sup>

## Synchronization

Wehrmacht senior commanders were trained to issue orders that synchronized the combat power of their units by effectively planning two echelons down, and thinking two echelons up. Senior commanders planned two echelons down, issuing mission-type orders that specified what was to be done, rather than how to accomplish the mission.

A division issued tasks to each of its battalions. The commander usually did this personally, issuing an oral order overlooking the battlefield. Each regiment would receive instructions for each of its battalions based on the division plan. The regiments would then synchronize the elements of combat power as directed by the division plan. In this manner, a high degree of unity of effort was achieved. Junior leaders were expected to take decisive action, guided by the commander's intent.

The synthesis of these techniques led to a powerfully focused combat force, directed by a fast-reacting chain of command that sought out enemy mistakes and took immediate and decisive advantage of them. "Divisional operations were conducted from the forward position on the battlefield. The division commander had his place with the group which was to make the main effort (*schwerpunkt*). He visited the regiments several times a day. The divisional headquarters was somewhat farther back and did not change its location during operations."<sup>7</sup> The Germans believed that the basis for command was formed by the mission and the situation. The mission consisted of what objective was to be achieved. The order to accomplish the mission must be simple,

clear and definite. The order establishes the guidelines necessary to accomplish the mission. It establishes what units are to do; not how they are to do it. The method of execution is deliberately not included. Subordinate commanders are trusted to come up with the "how." Mission oriented discipline is demanded.

This approach substituted control for guidance and trust. If the subordinates' abilities did not meet the challenge of the situation, or if the situation required a more experienced head, the senior commander was expected to take command of the subordinate unit and take decisive action. The understanding between commander and subordinate was that the senior commander's intervention was his natural prerogative. By taking command of a subordinate unit, the senior commander could use his authority and experience as a direct combat multiplier.

This concept of trust became a central principle in the Wehrmacht.

*"The combat value of every unit depends on the quality of its officers. An average trained unit, which has its weak points, can still give a good performance if it has a good commander. In the same manner, a well-trained and experienced unit may fail under a mediocre commander. The value of good leadership is proved by the confidence of the troops in their leaders, the improvement of their fighting qualities, and finally by success in combat.... The confidence which the troops have in their commander will give them the assurance that his orders are correct, even if the reason behind them is not fully known."*<sup>8</sup>

## Conclusion

The need to understand the concept of forward command is as important today as it was to the Wehrmacht's command style in World War II. The architects of the Army's AirLand Battle doctrine recognized this and made the understanding of the commander's intent a central theme of AirLand Battle doctrine.

The commander "cannot depend on constant direction, but must fight independently, even when he cannot communicate outside his own zone or sector. He must know the intention of the commander two levels above him, understand the concept of operation of his immediate commander, and know the responsibilities of the units on his flanks and in support of his operations."<sup>9</sup>

Tactical success in the early years of the war, however, was not enough to gain overall victory for Germany in WWII. Forward command could not overcome the overwhelming numerical superiority that opposed Germany. Fighting a war on many fronts against the entire world was too much, even for the well trained and superbly led Wehrmacht. Key leader casualties could not be replaced fast enough. As the war dragged on, the quality of the leadership and the quality of the soldiers was reduced to the point that tactical flexibility was greatly reduced. The German reach simply outdistanced their grasp. The perfection of the technique, however, is worthy of study.

In an era in which the United States Army will have to do more with less, the technique of forward command will become a necessary element of victory. FM 100-5 (p. 23) states;

*"The fundamental prerequisite for unity of effort within Army organizations is an effective system of command which relies upon effective leadership to provide purpose, direction, and motivation; emphasizes well understood common doctrine, tactics, and techniques, as well as sound unit standing operating procedures (SOPs); and takes effective measures to limit the effects of friction. Leaders set the example, communicate their intent clearly, build teamwork, promote sound values, accept responsibility, delegate authority, anticipate developments, take decisive action, and accept risks."*

For the Wehrmacht, these goals were met by the philosophy of forward command.

## Notes

<sup>1</sup>Department of the Army, *Field Manual (FM) 100-5, Operations*, (Washington, D.C.: May 1986), p. 21. (Hereafter referred to as FM 100-5).

On page 22, the manual states that "if an unanticipated situation arises, committed maneuver unit commanders should understand the purpose of the operation well enough to act decisively, confident that they are doing what their superior commander would order done were he present.

<sup>2</sup>Field Marshal Erwin Rommel, *The Rommel Papers*, ed. by Sir B. H. Liddell Hart, trans. by Paul Findlay, (New York: Harcourt, Brace and Company, 1953), paraphrased from pp. 8-11.

<sup>3</sup>LTC Mountcastle, "Command and Control of Armor Units in Combat," *Military Review*, November 1985, p. 29.

<sup>4</sup>Generalmajor A.D.F.W. von Mellenthin, conference notes from *Armored Warfare in World War II*, (Columbus, Ohio: Battelle Columbus Laboratories, May 10, 1979), p. 11.

<sup>5</sup>Field Marshal Erich von Manstein, *Lost Victories*, edited and translated by Anthony G. Powell, (Novato, Calif.: Presidio Press, 1982. Original in 1955), p. 383.

<sup>6</sup>*Ibid.*, p. 383.

<sup>7</sup>Mellenthin, p. 26.

<sup>8</sup>Generalfeldmarschall Albert Kesselring, *Manual for Command and Combat Employment of Smaller Units (Based on German Experience in World War II)*, (originally prepared by the Chief Historian, Headquarters European Command United States Army, on 17 July 1952), p. 12.

<sup>9</sup>FM 100-5, p. 22.

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# The Case for Light Cavalry

by Major Robert J. Wottlin

*We deployed an airborne corps without a corps-size covering force...A light cavalry regiment (LCR) could do for the airborne corps what an armored cavalry regiment (ACR) does for a heavy corps.*



## DESERT STORM

Do the Persian Gulf War's successes reaffirm the practice of employing main body forces without cavalry outfits or with ill-organized cavalry organizations? Satellites, aircraft, and special operations units provided vital battlefield information, but these high-tech systems are best for long-range planning. In the fog of battle, scouts in contact provide the most timely intelligence to the ground commander. We continue to rely less and less on cavalry outfits to conduct reconnaissance and security missions. When the enemy situation is unknown, it is not sound to allow main body forces to fight the covering force battle. A cavalry unit fighting the covering force battle provides early warning, reaction time, maneuver space, and information about the enemy.

We deployed an airborne corps without a corps-size covering force (until the 3d ACR arrived), and divisions with ill-organized divisional cavalry squadrons. Future table of organization for the divisional cavalry squadron will correct the divisional problem. The corps-size problems still

exist. A light cavalry regiment (LCR) could do for the airborne corps what an armored cavalry regiment (ACR) does for a heavy corps.

## Light Cavalry Regiment

A LCR using firepower, mobility, and combined arms can conduct reconnaissance, security, and economy-of-force missions as part of a light corps' offensive and defensive operations. A cavalry regiment conducting

a reconnaissance mission provides the corps commander the ability to see 30 kilometers forward of his forces. As a security force, the mobility and combined arms organization allows a cavalry outfit the ability to change quickly from defense to offense by disengaging, moving rapidly over long distances, and counterattacking to destroy or delay enemy forces.

The combined arms squadrons and troops of the LCR would permit detaching them to provide reconnais-

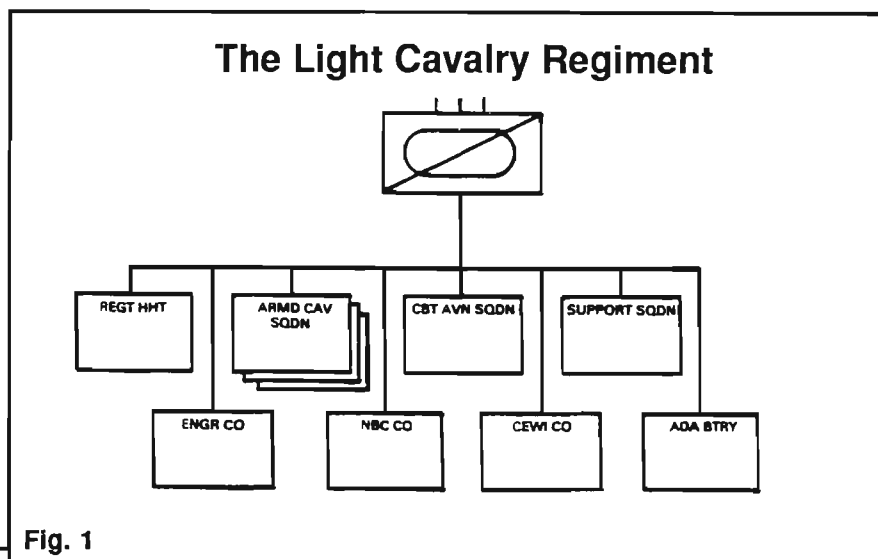


Fig. 1

The regimental light cavalry squadron has the same organization as the heavy cavalry squadron, except the howitzer battery has towed 105-mm cannons.

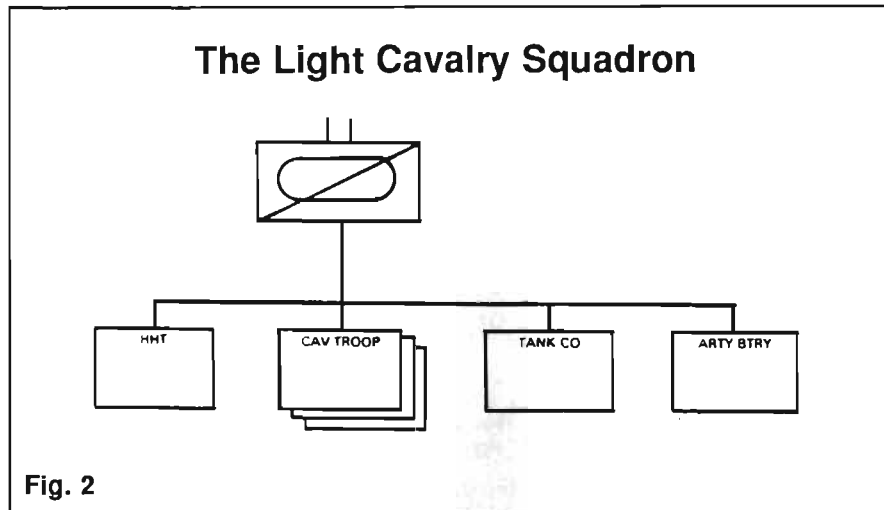


Fig. 2

sance and security for division and brigade operations. A light cavalry squadron or troop could deploy with a division or brigade-size element or with battalions operating separately. Also, the LCR could provide a self-contained force for an economy-of-force operation in the main battle area (MBA).

### Light Organization

The LCR organization uses the same table of organization as the ACR. The

major difference between the LCR and the ACR organization is the combat vehicles and weapon systems. The light cavalry, equipped with high mobility multipurpose wheeled vehicles (HMMWVs), motorcycles, armored gun systems (AGS), and towed artillery could enhance the light fighter's combat power. This self-contained unit would have three light cavalry squadrons, a combat aviation squadron, and a support squadron (Figure 1). The regimental light cavalry squadron has the same organization as

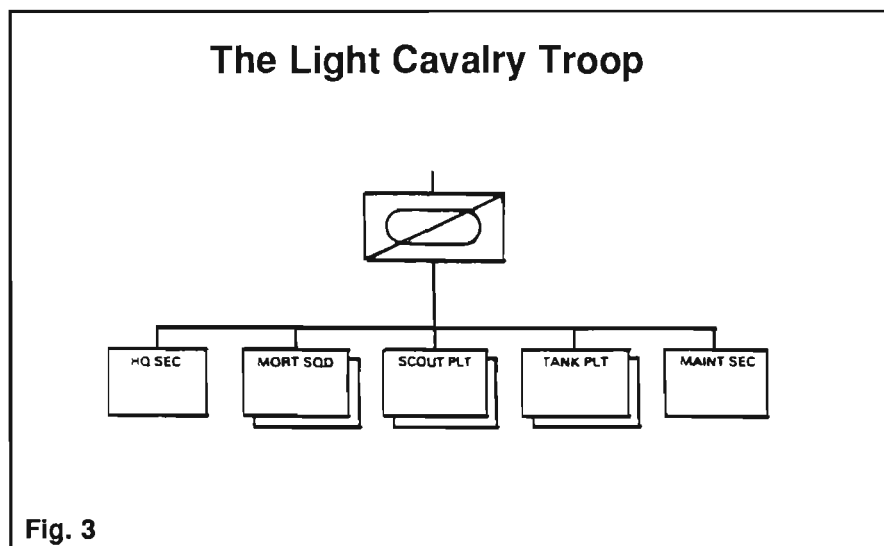


Fig. 3

the heavy cavalry squadron, except the howitzer battery has towed 105-mm cannons (Figure 2). The tank company, of course, has an AGS, but with the same organization. The light cavalry troop's scout platoons have motorcycles and HMMWVs, and tank platoons have the AGS (Figures 3 & 4).

### Force Protection

The survivability of the LCR is not equal to that of the ACR, but proper use of terrain, movement techniques, and dispersion would enhance it. Firepower and mobility are its important strengths. Cavalry commanders can mass their fires and forces on critical points to attack enemy weaknesses, gain time, and exploit successes.

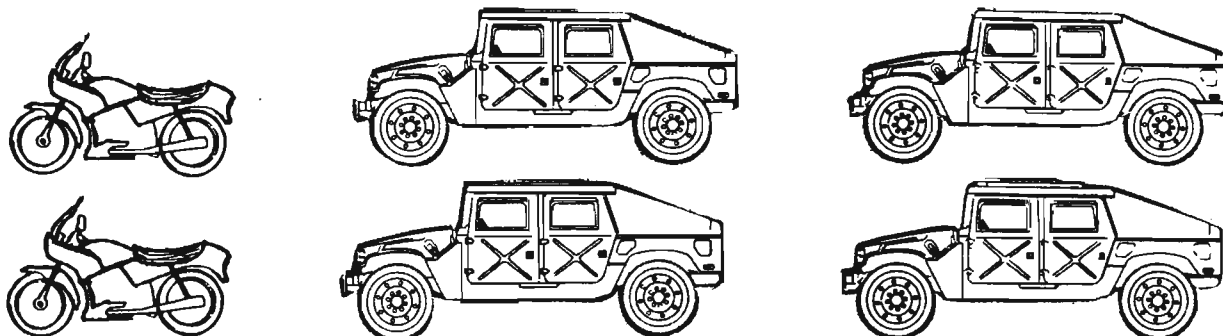
The air cavalry squadron (equipped with AH-58Ds or RAH-66s) adds three-dimensional mobility and aerial firepower to complement ground forces. The combination of TOW missile-equipped HMMWVs and high velocity 105-mm armored gun systems (AGS) provides the light fighter increased protection against enemy armored forces in mid-to high-intensity conflicts. The rapid mobility and smaller vehicle size permit the LCR to operate in low- to mid-intensity conflicts as well. The scout platoon includes enough personnel for dismounting and for manning vehicles during dismounted operations. Mortars and howitzer batteries organic to the light regiment provide essential indirect fires. The LCR would clearly increase the light fighter's reconnaissance and security capabilities in most conflicts.

### Armored Gun System

An armored gun system is the key to make this light force work. All other weapon systems are available. A stra-

## Light Cavalry Platoons

### Scout Platoon



### Armored Gun System Platoon

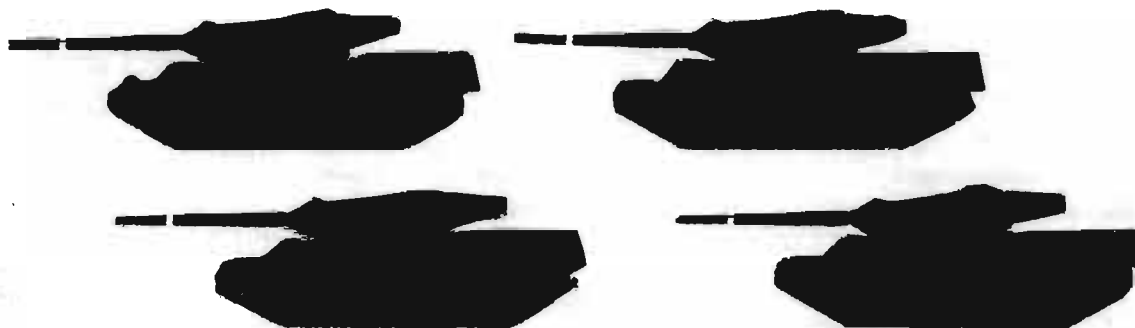


Fig. 4

tegitally deployable, lightweight tank killer with a rapid firing cycle (quicker than the TOW missile) would give the LCR the ability to fight the covering force battle. The Sheridan's marginal performance in JUST CAUSE, and now DESERT STORM, proved its inability to fight on today's battlefield. We need a new, easily deployed armored tank killer for light forces.

We know that future constrained budgets do not allow for a new acquisition program, but we must replace the Sheridan. Industry has made significant investments in prototypes that we cannot afford to let slip away. If everyone understands that the AGS is not a replacement for the main battle tank, then we might get the funding.

### Conclusion

BG L.D. Holder, former 2d ACR commander, commented: "One of the points drawn from the war (Persian Gulf) is the Army needs its cavalry regiments. It used all three to good effect. In contingency operations, the requirements for reconnaissance, security, and economy of force — the very things cavalry units are made for — arise immediately after the initial task of securing a base."

The Army needs to give its light corps a regimental cavalry outfit like it does for the heavy corps. If force reductions in Europe reduce the need for a second ACR there, then the Army might convert the other into a light fighter structure. Also, we must

pursue a strategically deployable AGS for our contingency forces. We cannot afford to continue deploying light forces without vital cavalry forces and with an obsolete tank killer.

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# THE ARMORED FORCES MONUMENT



Army Chief of Staff General Gordon R. Sullivan and Mrs. Creighton Abrams admire the centerpiece of the Armored Forces Monument they unveiled moments before.

PHOTO: SGT RANDY DYKSTRA

## Remarks at the Dedication of the Armored Forces Memorial November 11, 1991

**General Gordon R. Sullivan,  
Army Chief of Staff**

Mr. Ambassador, Comrades, General Streeter, and fellow soldiers. I'm glad that you are with us today.

It's an honor for me to be here with you today, to share in this moment with you. We pause on this important day — an important day for America, a significant day for us — to dedicate in this very simple ceremony, a monument lovingly brought to reality by people standing here, to recognize soldiers and Marines who went into battle in armored vehicles against

the enemies of the United States of America, and against the enemies of freedom.

The symbolism carved in this beautiful granite tells the story of countless thousands who call themselves armored warriors. You can see the symbolism: our service seals — United States Army, United States Marine Corps; the maps of our campaigns — World War I, World War II, Europe, the Mediterranean, North Africa, the Pacific, Korea, Vietnam, and the Persian Gulf. The emblems and numbers of our units are proudly etched in the granite. Our heritage is displayed on the vertical wall, reaching back into time, commemorating the ideas of a visionary, General Chaffee, who so perceptively and eloquently stated the essence and the power of armored forces:

“A balanced team of combat arms and services of equal importance and equal prestige.”



Above, the color guard for the dedication ceremony was from the 3rd U.S. Infantry, "The Old Guard." Right, General Sullivan presents a memento of the occasion to the Kuwaiti Ambassador to the United States, Shaikh Saud Nasir Al-Sabah.

PHOTOS: SGT RANDY DYKSTRA



However, this great monument on this hallowed ground is not a monument to numbers or things. This is a monument which symbolizes the courage of a select few soldiers who climbed into vehicles of steel, giving life to the ideas of the Chaffees, the Devers, and the Pattons. This monument memorializes the self-sacrifice of thousands of nameless, faceless people who risked all to serve as armored warriors. We may not remember their names, but they are not unknown to us. These men and women — yes, women — served in units not for personal gain, but because their nation called. This monument recognizes them and you, for your sacrifices for democracy, the dignity of your fellow man, and the principles for which this nation stands:

"We hold these truths to be self evident, that all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness."

United under our colors, red, white and blue — the national colors — we answered the call as a balanced team of mounted warriors, forging a concept of war

that delivers decisive victory. We banded together, as this circle binds us now — into crews, platoons, and units famous for their courage, their daring, and their selfless service.

Reflect on this bond, with these words from one warrior to his soldiers before battle — Henry V before Agincourt:

"From this day to the ending of the world, we in it shall be remembered — we few, we happy few, we band of brothers, for he today that sheds his blood with me shall be my brother."

Our flag, our triangular patch, these units, our circle of brotherhood represents our fight for freedom in this century. In the 18th Century, we secured our own freedom. In the 20th Century, we served others. We served around the world. This monument chronicles those terrible, but necessary battles: St. Mihiel, Normandy, the Rhine, Italy, Casablanca, Okinawa, Tarawa, Pusan, the Naktong River Line, Cambodia, Ap Bac, Thon Son Nhut, Bien Hoa, Khafji, Safwan, Wadi al Batin, Basrah.



General Sullivan delivers the dedication address. Seated, left to right, are MG Thomas C. Foley, Chief of Armor; Shaikh Saud Nasir Al-Sabah, Kuwaiti Ambassador; Mrs. Creighton Abrams; MG William F. Streeter, commander, Military District of Washington; and Chaplain (BG) Donald W. Shea, deputy chief of chaplains, U.S.A.

PHOTO: SGT RANDY DYKSTRA

Victory in the Cold War, the seminal event of our lifetimes, was also a result of people who were willing to serve as armored soldiers and persevere in a lonely war of nerves for the last 46 years. This stone memorializes Grafenwoehr, Hohenfels, Butzbach, the Fulda Gap, the National Training Center and the crumbling of the Berlin Wall.

This circle symbolizes that we have done our battle duties, sacrificed ourselves, and return to this hallowed ground. Today we consecrate this small plot of earth to the soldiers and Marines who had the courage to mount those steeds of steel, to protect an idea — democracy — and to free others from oppression.

Each of us recalls names from the past — Patton, Eisenhower, Abrams, Leach, Knowlton, Otis, Starry, Palmer, Tait, Funk, Griffith, Franks, and countless others. You can name them. They're in our memories. We know them, loved them, we fought with them, we

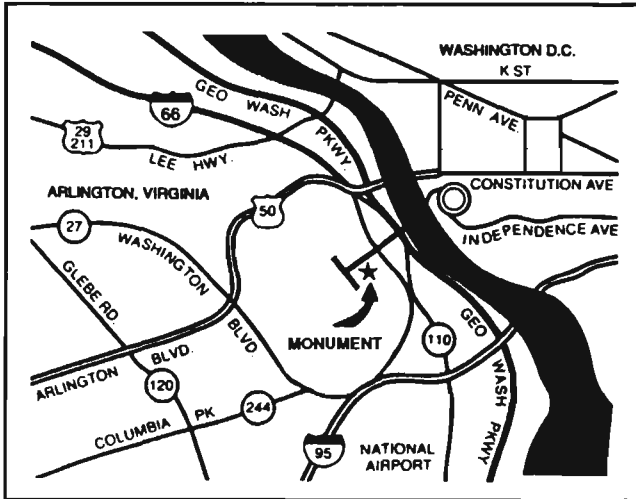
laughed with them, and we shared in the joys of service to this great republic.

Mrs. Abrams will unveil this monument. She represents a great link with the past, but she also represents our wives and children who served with us, loved us, and supported us. This monument is to all of them, and to you — to those who serve today, and to those who follow.

We will add to this monument someday. The additions are unknown to me. I can't predict them. I cannot draw the battle maps. But I know clearly that those who follow will serve with distinction and courage and honor — just as you served with courage and honor.

God bless them, God bless this monument, and God bless you. God bless all who call themselves armored soldiers and Marines.

Thank you.



*The 99th Congress approved Public Law 99-620 on November 6, 1986, authorizing the establishment of a memorial to honor the American Armored Forces. "The memorial shall commemorate the exceptional professionalism of the members of the American Armored Force and their efforts to maintain peace worldwide."*

## The Monument

The monument to the Armored Forces of the United States Army and United States Marine Corps past, present, and future was dedicated on November 11, 1991, near the entrance to Arlington National Cemetery on Memorial Drive ("The Avenue of Heroes").

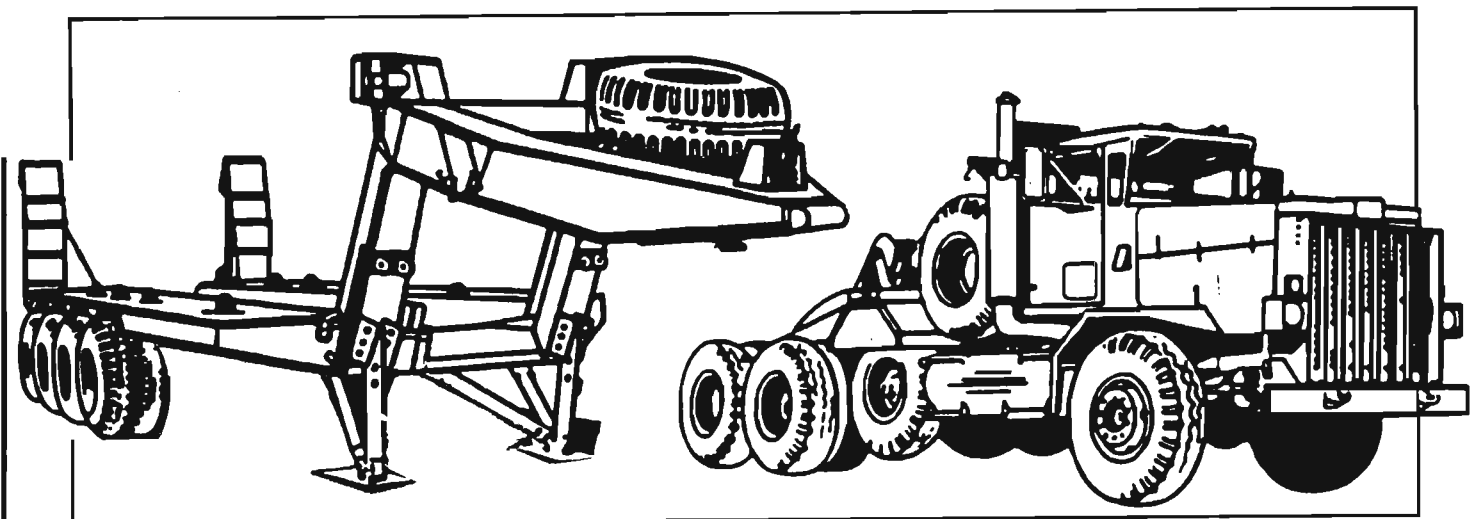
The monument is a memorial to all Army and Marine tankers, cavalymen, and tank destroyers who fought in the mechanized wars of the 20th Century — from WWI to Operation DESERT STORM.

Designed by distinguished military memorial architect Harold Schaller, the oval-shaped monument is 40 feet wide and 30 feet deep, encompassed by a three-foot wall of fine-grained Vermont granite. On the wall is engraved historical text, campaign maps and the units that fought in each of the five wars depicted. The highlight of the monument is a magnificently carved centerpiece of Nubian black granite eight feet tall and 10 feet wide on which is depicted the evolution of the U.S. Armored Forces. (Some of the original art was executed by ARMOR's contributing artists, SFC Robert Torsrud and SPC Jody Harmon.)

## Sponsoring Associations

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# Can't Get There From Here: Moving the Heavy Force

by Captain Harry Schute, Jr.

In days of old, when all infantry moved on foot and all cavalry on horse, the expression of the time was, "march to the sound of the guns." Today, with conflict frequently thousands of miles from one's shores, that expression easily could be, "deploy to the sound of the guns." When Saddam Hussein's Iraqi Army invaded Kuwait and threatened Saudi Arabia in August 1990, the modern version of the tested axiom almost became a mission impossible for the U.S. Army's heavy forces.

Iraq committed to Kuwait a large conventional force, consisting of vast quantities of tanks, armored vehicles, and artillery. Iraq's forces dictated that the Allied Coalition deploy a similar mechanized force to meet the heavy threat. Our Army's heavy focus for the last 40 years, however, has been on reinforcing Central Europe, not Southwest Asia (SWA). This meant that our deployment and build-up in SWA was in a completely immature theater, with no Pre-positioned Materiel Configured to Unit Sets (POMCUS), or support infrastructure.

The initial Allied deployment was a major undertaking, and although well executed, could have been a disaster if Saddam had decided to invade Saudi Arabia in September or October 1990. That, however, is a completely different story. An operation after the deployment — just as difficult and vitally important — was the movement of the combat divisions from their Sea Ports of Debarkation (SPOD) to their Rear Assembly Areas (RAA) and Tactical Assembly Areas (TAA). It is this operation — and some of the "what if's" and "what should we learn" — upon which I will focus.

Army Transportation's focus on Europe is readily apparent in its published doctrine: "The most challenging situation is that posed by the Soviet-led Warsaw Pact forces in Europe. It is for this challenge that the bulk of the U.S. Army forces are organized, equipped, and trained."<sup>1</sup> The focus on Europe is further evident in the following planning assumptions: that units will be in deployed positions before hostilities, dependents will be present, host nation (HN) and

Allied transport will be readily available, heavy transport will only be needed for high priority units in moving POMCUS materiel, and rail will be heavily relied upon to move heavy equipment to the corps rear or division support area.<sup>2</sup> With the demise of the Warsaw Pact and the conclusion of Operation DESERT STORM, it should be obvious that we need to plan better for intratheater transportation of heavy forces in other contingency areas.

Many potential areas of conflict, such as the Middle East or Central America, do not have well established rail networks, or even extensive road networks. Consequently, transport of heavy equipment in these areas of operation would have to rely on Heavy Equipment Transporters (HET). This was the case in Saudi Arabia.

When faced with the prospect of moving hundreds of miles from SPODs to RAAs and TAAs, with no rail and limited roads, the Army's Abrams tanks, Bradley Fighting Vehicles, howitzers, etc., etc., had to move by HET. The wear and tear of a move

over long distances in the harsh desert environment — really in any environment — without HETs would have caused much higher rates of vehicle mechanical failure. In SWA, we were able to marshal enough HETs to meet the minimum requirements, but the simple fact remains that our Army is not readily configured to provide large scale HET support to heavy forces.

Currently, you can find HETs at three levels in a theater of operations. At division level, the Division Support Command's (DISCOM) Transportation Motor Transport Company (TMT) has two HET platoons with a total of 24 tractors and trailers. The primary purpose of these HETs is to move heavy equipment back to maintenance collection points.<sup>3</sup>

At corps level, the organization is a bit more complex. The Corps Support Command (COSCOM) has a Transportation Brigade with a flexible number of direct support (DS) — average of three — and general support (GS) — average of four — battalions.<sup>4</sup> The DS battalions include a number of light and medium truck companies. The GS battalions are similar, but also have a heavy truck company of 24 HETs.<sup>5</sup> The purpose of these HETs is for unprogrammed movements and supporting corps rear area operations.<sup>6</sup>

Finally, at theater level, the Transportation Command has a flexible number of motor groups or brigades that have a flexible number of motor battalions. Each of the motor battalions has a HET company of 24 vehicles. The primary purpose of these HET companies is for administrative movements.<sup>7</sup>

Based upon the assets that may reasonably be available from corps and theater, a division commander can expect to have a tank-to-HET ratio of between 7:1 and 15:1. Two assumptions used in developing this ratio are that only tanks will be moved by the HETs, and the HETs will have an operational readiness (OR) rate of 100 percent. Of course, neither of those assumptions is valid, because the divi-

sion will have to move at least as many other armored vehicles as tanks, and the planning OR rate for HETs is 75 percent.<sup>8</sup> Some additional planning guidance for HETs includes having each of the HET company's trucks capable of making either four local haul round trips, or two line haul round trips.<sup>9</sup> Each line haul is expected to have a 90-mile one-way distance.<sup>10</sup> So the bottom line is that a division commander could have significant trouble moving a tank battalion administratively across a distance of more than 90 miles.

As DESERT STORM drew near, Army forces in SWA were at an average tank-to-U.S. HET ratio of approximately 7:1. Once again, that figure only provides for tanks, and counts all HETs on hand, without regard to operational readiness. It was only with considerable host nation and Allied HET support that units were able to move from the port to the RAAs in a matter of several days instead of weeks. Likewise, the same was true as forces moved forward from RAAs to TAAs.

As the result of four problems — receiving HET support from a collective grab bag of sources, moving over distances that exceeded the 90-mile planning factor, moving the divisions' other armored systems, and dealing with a HET fleet that was regularly near its doctrinal planning OR rate, meant that our force was very vulnerable during the entire deployment. Units were fragmented because of extreme transportation schedules, command and control were strained, and any desire to achieve rapid mass remained a dream.

Ironically, our adversary, Iraq, had a tank-to-HET ratio of nearly 3:1. Its favorable HET ratio, and internal supply lines, made it relatively easy for Iraq to realign forces. And if the Iraqis had been wise to the brilliant Allied flanking maneuver, they might have preempted our initiative by moving some of their armored force into a better position to react.

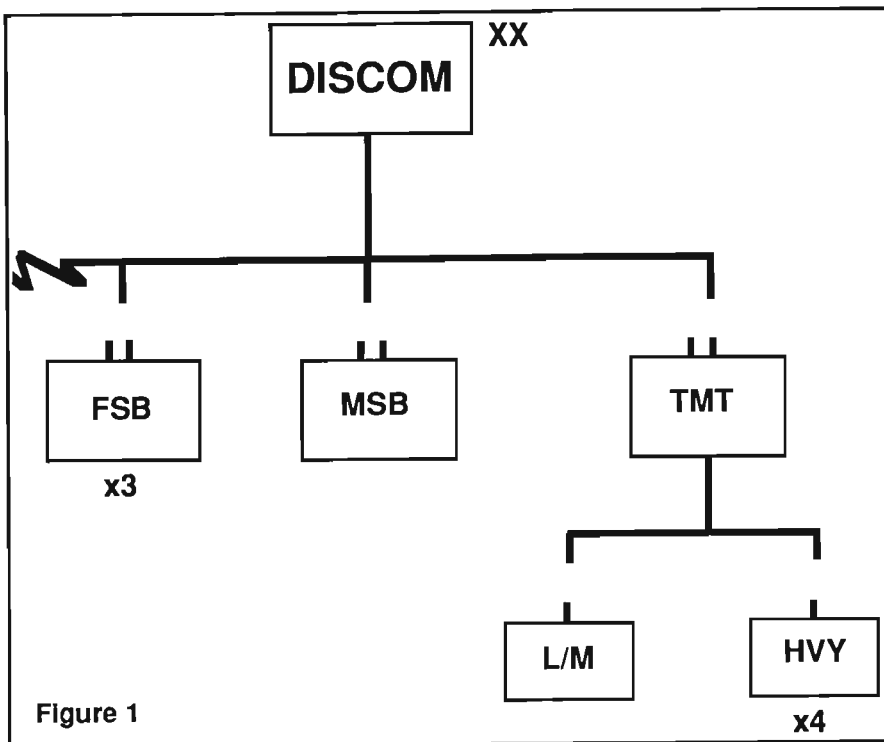
When the time came in February 1991, to see if the HETs — Allied and U.S. — had done their job, the answer was apparent. Our tanks, Bradleys and howitzers entered the ground war with all fleets above 90 percent OR rates. This figure would have been far worse if those vehicles had road marched to their RAAs and TAAs.

In future contingencies that require heavy forces, we may not be as fortunate to enter a scenario in which the host nation and Allies can provide large numbers of HETs to ease our transportation burden. In fact, our own doctrine acknowledges that intratheater transportation may be one of the most restrictive operational elements.<sup>11</sup> And more specifically, that "HETS are scarce, vital assets in the delivery of heavy equipment..."<sup>12</sup> In such a future scenario, we would be in the midst of a situation in which the HET ratio would be far below the minimum requirement to move a heavy force from one point to another in a matter of days instead of weeks. The simplest way to plan properly for this contingency is to increase the number of HET units available to the division and corps commanders.

I am sure many readers will wonder where we would get the spaces to man my proposed HET units, but that is beyond the scope of this article. Suffice it to say that in this age of reduction, the "easiest" place to make the HET units would probably be in the Reserve Component (at the expense of other units). The HET organizations I propose would become roundout organizations to their parent support commands. And, let's face it, it is sure easier to synchronize the battlefield employment of a HET company than it is a combined arms maneuver brigade.

Putting aside the source of the HET assets, what I will do now is outline what I think is a good short-term solution to contingency HET support. At division level, I would replace the DISCOM's TMT company with a TMT battalion composed of a





light/medium truck company and four HET companies (see Fig. 1). The TMT battalion's HET companies would have a minimum of 24 trucks each.

The HET companies in this new TMT battalion would operate much like the other division-level units, in that they would be sliced to the maneuver brigades in a direct support role. The fourth company would either remain under division control or become DS to the brigade or division that has the most critical transportation needs. The light/medium truck company would continue to fulfill its present role except it would have expanded capabilities.

The addition of the TMT battalion to the DISCOM would change the scenario from one in which the division can expect a tank-to-HET ratio under optimum conditions and augmentation of 7:1 to a scenario in which the division can expect an everyday, unsupported tank-to-HET ratio of 4:1. Remember, that is tanks only, no other combat systems are included in these calculations.

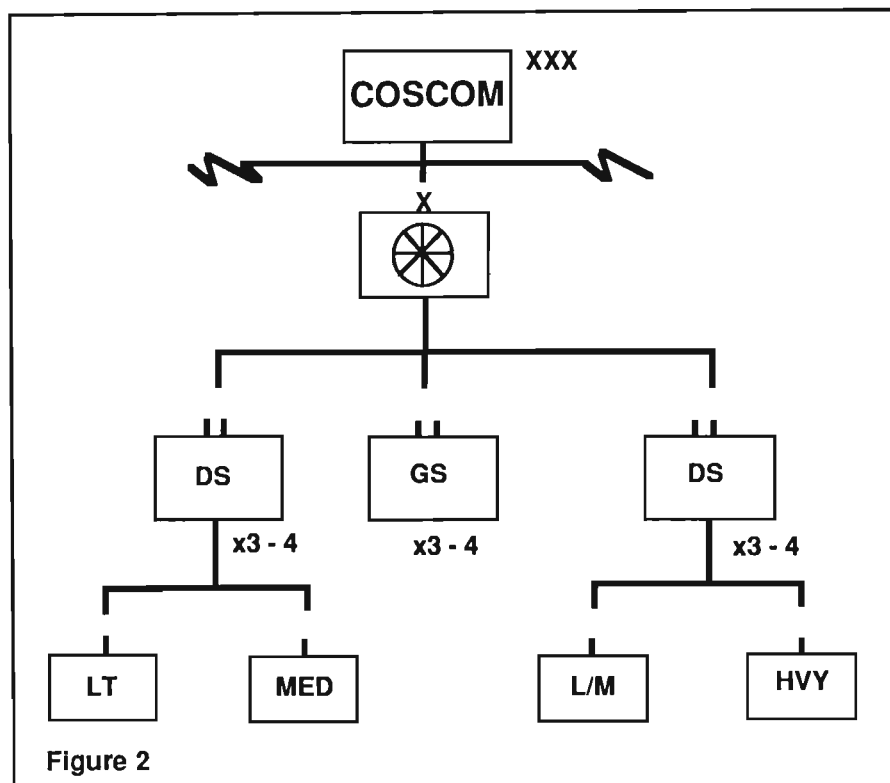
At corps level, I would add to the COSCOM's transportation brigade DS battalions configured exactly like that of the division's new TMT battalion

(see Fig. 2). The number of battalions would be dependent upon the number of divisions normally assigned to the corps, with a planning average of three. These battalions would be assigned to the division in a DS relationship to augment its transportation needs. Much like the situation at divi-

sion level, the corps battalions could have their habitual support relationship changed to meet the unforeseen critical transportation needs of another division.

A division's augmentation by a DS battalion from the COSCOM would further improve the division commander's tank-to-HET ratio to approximately 2:1. Of course, the COSCOM's GS battalions, with their one HET company each, would still be available to perform their intended mission to provide unscheduled support. Emergency use of the GS assets would place the tank-to-HET ratio solidly at 2:1. This is obviously a vast improvement over the current best case 7:1 ratio.

As with any organization that relies upon support relationships, and works tactically with units other than those in its in garrison, this new organization would need periodic training. The armored vehicle crews would need to gain experience loading their equipment on HETs rather than trains, and the HET operators and units would need to get used to working for a brigade or division commander on a regular basis.



This plan to increase the HET support available to the heavy force is certainly not the total solution to the myriad problems in an administrative move. This plan could, however, be a step in the right direction, making a heavy force movement less of a challenge.

The image of hundreds of tanks, Bradleys, and howitzers stuck at Ad Damman, waiting for HETs to move forward, as the Iraqis roll across the Saudi border is not an attractive thought. Just as unattractive is the thought of that armored force being told to road march forward several hundred miles before going into combat. Oh, by the way, your OR rate probably will have dipped below 70 percent during that road march. Fortunately, time and our Allies were cards that we held in our deck during our buildup in SWA. Those cards allowed us to get our armored force in position in a reasonable amount of time, ready

to fight. Do we want to bank on having that same hand for the next contingency? Or would it be better to fix the planning and force structure now so that we can support the next contingency? I do know that I don't want to be the guy that tells that future division commander, "We can't get there from here."

## Notes

<sup>1</sup>FM 55-2, *Division Transportation Operations*, Washington D.C., 31 Jan 85, p. 2-1.

<sup>2</sup>FM 55-1, *Army Transportation Services in a Theater of Operations*, Washington D.C., 30 Nov 84, pp. 1-1, 1-6.

<sup>3</sup>FM 55-2, pp. 3-5, 6-6.

<sup>4</sup>FM 55-1, p. 2-5.

<sup>5</sup>*Ibid*, p. 6-3.

<sup>6</sup>*Ibid*, p. 2-6.

<sup>7</sup>*Ibid*, p. 2-3.

<sup>8</sup>FM 55-15, *Transportation Reference Data*, Washington D.C., 9 Jun 86, p. 3-8.

<sup>9</sup>*Op cit*, p. 6-3.

<sup>10</sup>FM 55-10, *Movement Control in a Theater of Operations*, Washington D.C., 22 Jul 86 w/C1, p. 5-2.

Captain Harry J. Schute, Jr. was commissioned in Armor in 1985 from the USMA. A graduate of AOBC, AOAC, CAS<sup>3</sup>, and Airborne School, he has served in 3AD in FRG as an M1 tank platoon leader, subcommunity operations officer, and company XO. He served as a training battalion adjutant, company commander, and at Directorate of Total Armor Force Readiness at Fort Knox. He is currently in the USAR.

<sup>11</sup>FM 63-3J, *Combat Service Support Operations - Corps*, Washington D.C., 12 Aug 85, p. 14-11.

<sup>12</sup>FM 100-10, *Combat Service Support*, Washington D.C., 18 Feb 88, p. 9-4.

## Letters *(Continued from Page 3)*

I was there for Tet, which raged for a bit more than 100 hours itself. Our Alpha Troop received a unit citation for saving Bien Hoa Air Base by tanks effecting firepower, shock action, and by running over several hundred VC bent on capturing the airfield. They didn't.

And I recall reading about a few tankers being in Korea, although on my last visit to the Patton Museum in 1989, you would have thought that armored warfare ended in 1945. It didn't.

Then of course there was The Big War itself, in which tanks played certainly a key role in the European Theater and a vital supporting role in other theaters. Let's not forget those whose actions brought The Combat Arm of Decision to where it is today.

Let's join to support both a combat tanker badge and a combat cavalryman badge however we can. But let's make the awards retroactive to recognize all treadheads whose actions deserved them. Let's recognize all who would have earned such an

award since the combat infantryman badge has been around. Fair's fair.

JOHN REICHLEY  
Leavenworth, Kan.

### Distinction Is Justified

Dear Sir:

After reading 1LT Ronald J. Bashista's letter, "War Revives Armor Badge Issue," I feel he's only concerned with those men who actually saw combat, and not those who make up the armor community.

It's true that M1/M1A1 crew members are jealous of their Infantry brothers, and feel they are worthy of distinction. For an Infantryman to receive an "EIB" (Expert Infantryman's Badge), he must go through a rigorous test of individual skills and physical endurance, the same is true of the "EFMB" (Expert Field Medical Badge) worn by our stellar medics.

Why not develop a "EAB" (Expert Armor Badge) program for the whole Armor community and award a reath for those who served in combat as an Armor crewman. The fact is there are expert tankers; there are expert scouts. This was proven when we sent expert tankers to transition M1 crews to M1A1 just weeks before DESERT STORM. It was those "expert" crews who brought victory home to the armor community.

So, who develops this program? I feel that a collective effort by the commanders, staff officers, and master gunners of the Armor Branch could develop such a program, one the entire Armor community would be proud to see.

The men of "Armor" are proud and gallant — they need a challenge; they need distinction. Let's give them something to strive for.

BARRY G. TANKERSLEY  
SSG, Master Gunner  
1/11 ACR, FRG

# The Cadre Armor Division Concept

by Colonel Joseph C. Kopacz

## Introduction

The direct result of AirLand Battle Doctrine at the tactical, operational, and strategic level of conventional warfare has been a shift in emphasis along the continuum of war from general war to regional conflict. The effective and efficient execution of this doctrine by the United States Army has to be considered one of the key reasons for the major political and military changes taking place in Central and Eastern Europe. At the strategic level, this doctrine has been the prime reason for the implementation of a deployment/utilization strategy that has caused potential enemies to reevaluate their strategic military options. Operationally, both friend and possible foe have deemed this strategy a viable option to ensure our capability to secure national survival and vital interests.

However, it is at the tactical level that both have been most effective. Not only potential enemies, but our soldiers realize that a plan is in place to win armed conflict, based on the AirLand Battle tenets of initiative, deep battle, synchronization, and adaptability. Moreover, in combination with an operational level deployment/utilization strategy of forward deployed, contingency, and reinforcing forces, the doctrine can be executed successfully.

Additionally, the effects of technological advances in the 1970s and '80s regarding weapon effectiveness, mobility, and communications have been phenomenal. An additional benefit of this advancement has been the development of a now well established training system, under TRADOC, that produces soldiers much more qualified, in less time.

These measures have greatly shortened the time required to respond to conventional conflict. Additionally, the Soviets' massive withdrawal from Warsaw Pact countries has increased the amount of time to more than one year to respond to large-scale general war.

Based on these realizations, plus fiscal constraints, it is the appropriate time to consider shifting part of our combat power from the Active Component (AC) to the Reserve Component (RC) - United States Army Reserve (USAR), in the form of cadre-level combat divisions.

A number of units are in place to accomplish this transition. Currently, there are 12 training divisions and two training brigades within the USAR RC structure. All of these units are Table of Distribution and Allowances (TDA) organizations. (However, they have a command and control structure from company/troop through battalion/squadron to division, organized along the lines of Table of Organization and Equipment (TO&E) combat units.) Of these 12, three divisions and one brigade are armor training organizations with the mission of Armor Center displacement, at Fort Knox, Ky. — 100th Division (Training), Louisville, Ky.; formation of additional armor training centers at Fort Hood, Texas — 84th Division (Training), Milwaukee, Wis. — 5th Cavalry Brigade (Training), Omaha, Neb.; and at Fort Bliss, Texas — 85th Division (Training), Chicago, Ill.

Due to the geographic proximity of the 100th Division to the Armor Center, combat support, and combat service support USAR-type unit support capabilities within that proximity, and empirical manning, training, readiness data, the first USAR divisional unit to be redesignated as a cadre division

should be the 100th Division (Training). In addition, for the past four years, the 100th has enhanced its already outstanding performance by conducting field training exercises to Army Training and Evaluation Program - Mission Training Plan (ARTEP-MTP) 71-2 tasks and standards, to the extent conditions would allow. This additional training has further enhanced the abilities of drill sergeants to train Initial Entry Training (IET) soldiers. It has also become a base of institutional knowledge that will allow the division to grow and mature into a combat cadre divisional unit.

## Concept

Historically, before World War I, Army combat divisions were maintained at a cadre level, to be augmented by state National Guard militias at times of national emergency. After World War I, based on the organization of Army divisions by General Pershing during World War I, a number of active divisions were maintained at combat-ready levels in both personnel and equipment. During an expansion of the Army, core elements from these combat-ready divisions would form the base of new divisions in time of national crisis. This was the method employed in 1942 and 1943 to meet the requirements of combat divisions for World War II. After World War II, the Army employed a combination of methods to both minimize total Army force manpower requirements and provide training for IET soldiers.

Here are three historic examples of this method:

- The 3d Armored Division was deactivated late in 1945 and reactivated as the 3d Armored Division Replace-

ment Training Center, Fort Knox, Ky. As reconstituted, the 3d maintained its combat division TO&E with subordinate commands at various levels of both personnel and equipment fill. Additionally, other elements remained at "cadre" officer and noncommissioned officer personnel levels and became the base for training more than 25 percent of all enlisted men joining the Army. In addition to the 14-week IET cycle, the division conducted six additional training missions: reenlisted refresher training; 16-week band training; leader course training (officer candidate preparatory/acting noncommissioned officer); specialist schools (mess stewards, cooks, clerks, and mechanics); "methods of instruction" cadre school; and reserve officer/enlisted training methods update courses. Upon completion of training, soldiers were reassigned to all branches of the Army. In 1955, the 3d Armored Division Replacement Center was reorganized into a tactical armored division, and in 1956 deployed to the Federal Republic of Germany as a TO&E combat armored division.

•The 2d Armored Division, which was the division that the 3d replaced in Germany, was redesignated as the 2d Armored Training Division, Fort Hood, Texas in 1958. While it maintained its armored division TO&E, the division was manned at a cadre level throughout. IET soldiers were attached to the assigned cadre-level units in order to complete both Basic Combat Training (BCT) and Advanced Individual Training (AIT) in the combat branches of Armor, Artillery, and Infantry. As with the 3d AD, after completion of BCT and AIT, attached personnel went to units throughout the Army. In 1962, after training more than 89,000 soldiers, the 2d Armored Training Division was redesignated a line armored division with a combination of soldiers who had just completed training and those

assigned from appropriate branch-specific schools.

•In mid-1946, after serving with distinction in World War II, the 100th Infantry Division was deactivated. Late in 1946, it was reactivated as the 100th Airborne Division, U.S. Army Reserve (USAR). In 1952, it was again redesignated as the 100th Infantry Division. In 1955, the 100th was redesignated, this time as a replacement division for the Replacement Training Center, Fort Knox, Ky. It was during this period that the 3d Armored Division was itself being reorganized from the Replacement Training Center, Fort Knox, to a line combat armored division. In fact, the 100th Division's mission was to assist the Replacement Training Center during the transition of the 3d Armored Division and the planned use of 2d Armored Division as an AC training division in 1958. In 1959, the division was redesignated as a "training" division. During the Berlin Crisis, the 100th Division (Training) was recalled to active duty and trained more than 32,000 soldiers in BCT and AIT skills at Fort Chaffee, Ark. Late in 1962, the division returned to reserve status. Reorganization of the division into a three-line-brigade organization took place in 1973; this provided a command and control structure along ROAD guidelines, facilitating the ability of the division to function as either a TDA or TO&E organization. The mission of the 100th Division expanded from strictly BCT and AIT to One Station Unit Training (OSUT) - Armor/Armored Cavalry in 1977.

This historical data, plus Department of the Army, "Army Ground Forces" studies 11 and 12, and the evolution of the Army of Excellence - Tables of Organization and Equipment (AOE-TO&E) will serve as the basis for this concept.

Assumptions made in order to develop this concept further are:

•Cadre divisions will be combat ready within one year of mobilization.

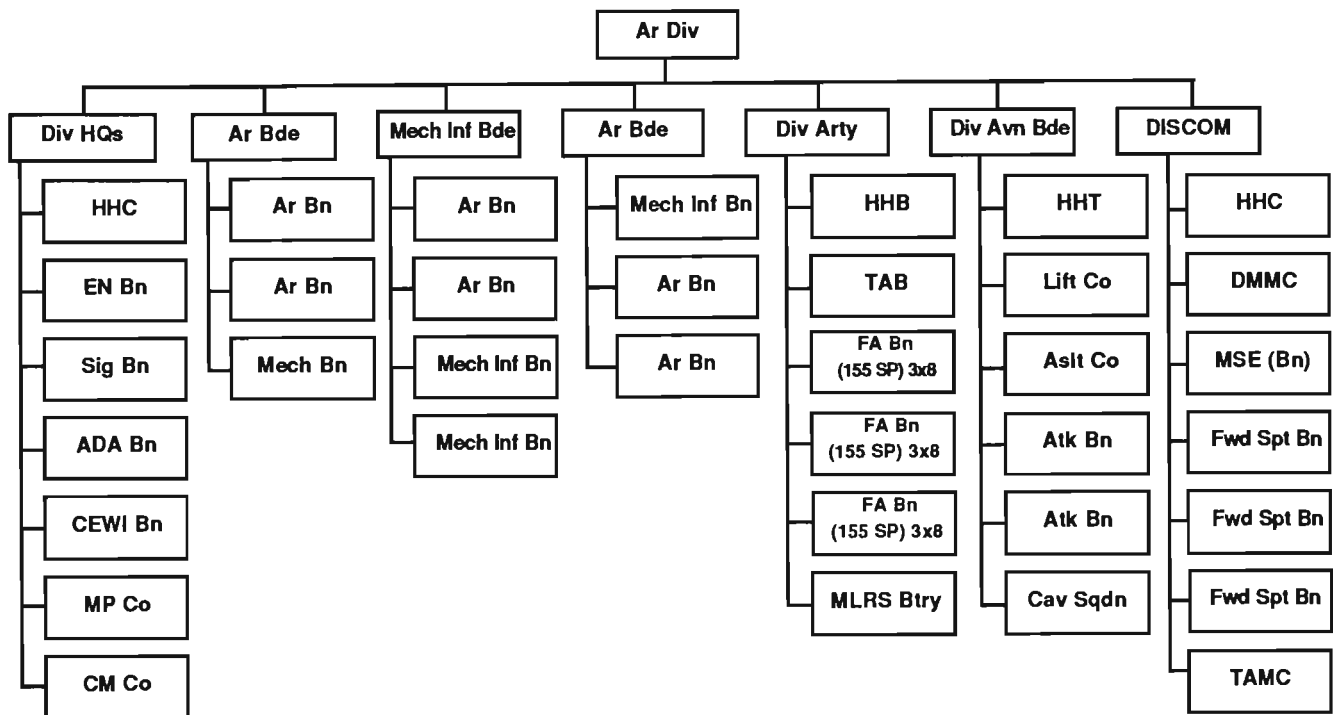
•Both AC and RC units will be located at Fort Knox, Ky., or geographically supportable from a division headquarters located in Louisville, Ky.

•Major subordinate commands of the cadre division will be located as close as possible to the cadre division headquarters.

Figure 1 shows the basic organizational structure of the cadre division. It is a ten-maneuver-battalion, series 87004L200 AOE-TO&E. While a "pure" cadre organization is possible, as shown in the TO&E, both its effectiveness as a Reserve Component major command and post-mobilization utilization would be extremely limited. Therefore, to bridge the gap between RC-National Guard combat division reinforcing forces, the training base requirements of RC-USAR training divisions and the formation of completely new combat divisions, I propose a modified "cadre" division (see Figure 2).

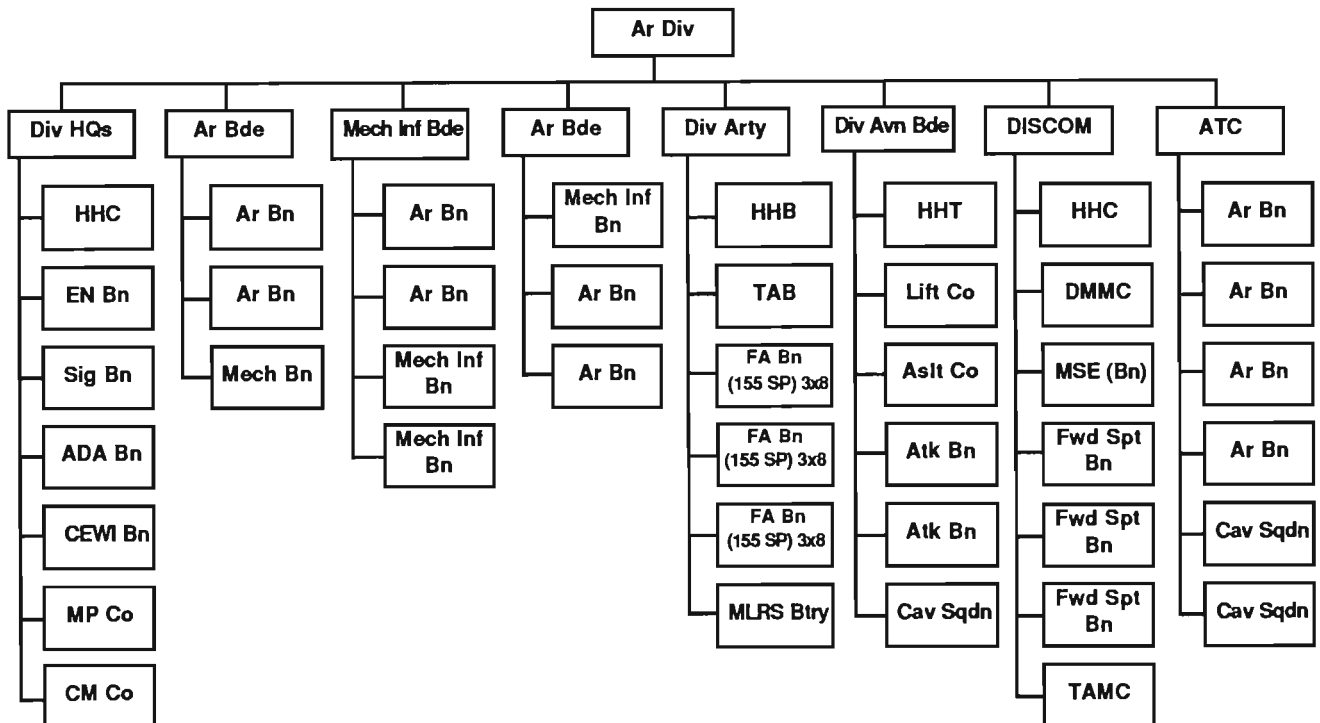
Conceptually, it is augmented with a fifth brigade consisting of four armor battalions and two armored cavalry squadrons organized under current TDA authorization. This fifth brigade, with an appropriate command and control slice from the division headquarters, is designed either to displace the 1st Armored Training Brigade, or augment United States Army Armor Training Center upon mobilization. Both these missions are currently compatible with missions assigned to the 2d Brigade, 100th Division (Training) and the division headquarters. In fact, the 2d Brigade, 100th Division (Training) has conducted Mobilization Armor Training Center training missions. This OSUT mission consisted of training IET soldiers, based on a 12-hour day, 6-day week Mobilization Program of Instruction.

**Armor Division L-Series TO&E  
Cadre Armor Division Study**



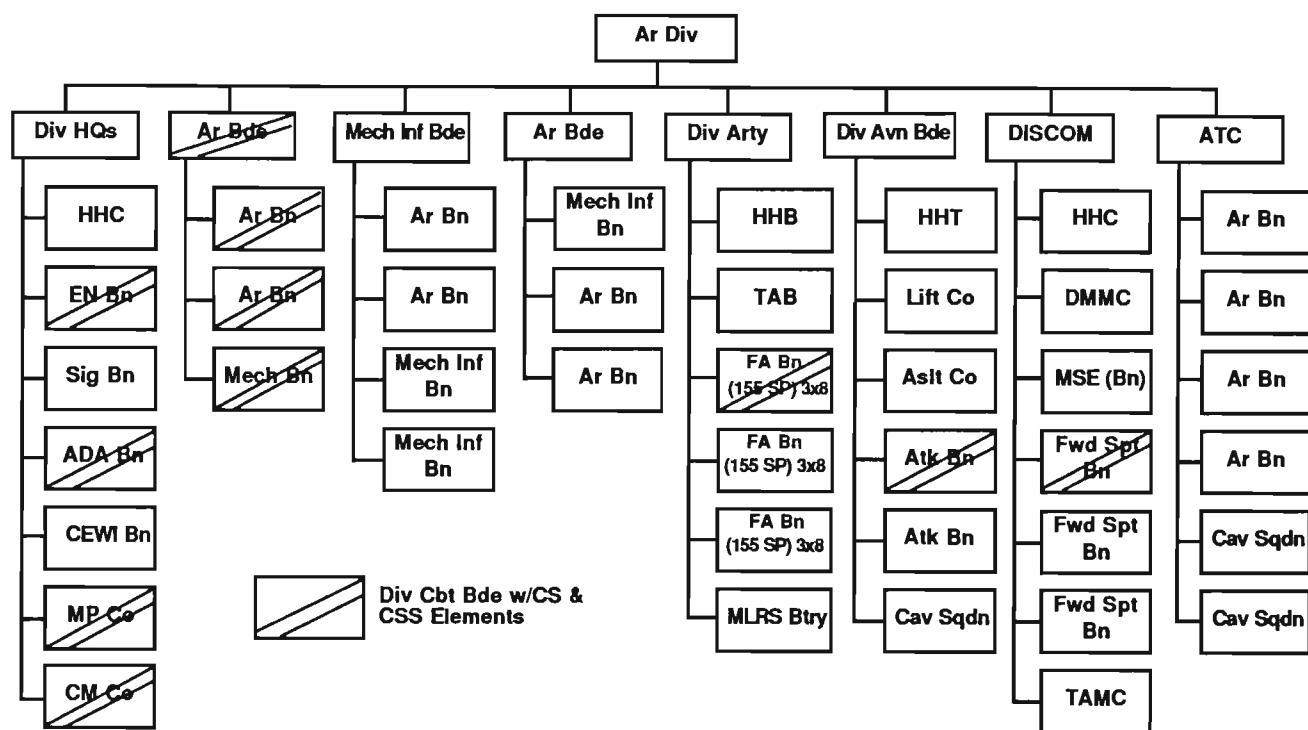
**Figure 1**

**Armor Division L-Series TO&E  
Cadre Armor Division Study**



**Figure 2**

## Armor Division L-Series TO&E Cadre Armor Division Study



**Figure 3**

The division consists of one armor-heavy brigade (1st Brigade), one balanced brigade (2d Brigade), and another armor-heavy brigade (3d Brigade). The 1st Brigade could consist of three Army National Guard battalions maintained at an Authorized Level of Organization (ALO) at or near combat readiness. In fact, it would be the division combat ready brigade with appropriate CS and CSS units also manned and equipped at that level (see Figure 3). The 2d Brigade would consist of USAR units at personnel and equipment levels prescribed by their applicable L-series cadre level organization. The 3d Brigade could consist of an AC brigade headquarters (194th SAB, Ft. Knox, Ky.), an AC armor battalion (1-10 Cav, Ft. Knox, Ky.), and a National Guard armor battalion, again, at or near ALO 1, plus a USAR mechanized battalion at cadre level.

With exceptions noted above, all other CS and CSS units would be organized per their applicable L-series AOE-TO&E and maintained at cadre level ALOs.

Personnel reorganized in existing TO&E units would require formal Area of Concentration/MOS education. AC unit personnel who are part of the division would provide a good additional source of soldiers for the RC if they change their status. A maximum of one grade above TO&E authorization would be permitted for NCOs in 11- and 19-series MOS duty positions. Active Guard and Reserve, and civilian personnel positions would be cross-leveled and consolidated wherever possible.

Key personnel strength comparisons are:

- A complete cadre RC armor division represents a 45 percent officer, a 77 percent enlisted, or a 74 percent

total personnel reduction compared to an ALO 1 AC organization. (Figure 4.)

- A complete cadre RC armor division with an armor training center TDA brigade represents a 41 percent officer, 76 percent enlisted, or 71 percent total personnel reduction compared to an ALO 1 AC organization. (Figure 5.)

- A cadre RC armor division with an armor training center brigade and its first brigade, as a division combat ready brigade with appropriate CS and CSS units (all ALO 1) represent a 34 percent officer, 59 percent enlisted, or a 57 percent total personnel reduction compared to an ALO 1 AC organization. (Figure 6.)

Training plans of units already conducting L-series TO&E and armor training center training will not be affected. Focus of training will be on those units requiring reorganization



**Cadre Armor Division  
Major Subordinate Cmd Roll-Up**

| <u>MSC</u>          | <u>ALO-1</u> |            |               |               | <u>ALO-2</u> |            |               |               | <u>ALO-Cadre</u> |            |              |              |
|---------------------|--------------|------------|---------------|---------------|--------------|------------|---------------|---------------|------------------|------------|--------------|--------------|
|                     | <u>O</u>     | <u>WO</u>  | <u>E</u>      | <u>I</u>      | <u>O</u>     | <u>WO</u>  | <u>E</u>      | <u>I</u>      | <u>O</u>         | <u>WO</u>  | <u>E</u>     | <u>I</u>     |
| Div HQ              | 239          | 41         | 3,025         | 3,305         | 237          | 41         | 2,793         | 3,071         | 140              | 22         | 572          | 734          |
| 1st Ar Bde          | 140          | 6          | 1,595         | 1,741         | 139          | 6          | 1,528         | 1,673         | 82               | 6          | 404          | 492          |
| 2d Mech Bde         | 190          | 8          | 2,619         | 2,817         | 187          | 8          | 2,454         | 2,649         | 97               | 8          | 482          | 587          |
| 3d Mech Bde         | 150          | 6          | 2,111         | 2,267         | 147          | 6          | 1,968         | 2,121         | 72               | 6          | 356          | 434          |
| DIVARTY             | 212          | 12         | 2,581         | 2,805         | 209          | 12         | 2,471         | 2,692         | 95               | 9          | 690          | 794          |
| 4th DA Bde          | 153          | 258        | 1,558         | 1,969         | 153          | 254        | 1,399         | 1,806         | 95               | 80         | 428          | 603          |
| Spt Cmd<br>(DISCOM) | 159          | 76         | 2,611         | 2,846         | 159          | 73         | 2,198         | 2,430         | 142              | 50         | 696          | 888          |
| <b>Total</b>        | <b>1,243</b> | <b>407</b> | <b>16,100</b> | <b>17,750</b> | <b>1,231</b> | <b>400</b> | <b>14,811</b> | <b>16,442</b> | <b>723</b>       | <b>181</b> | <b>3,628</b> | <b>4,532</b> |

**Figure 4**

**Cadre Armor Division  
W/ATC TDA Brigade**

| <u>Unit</u>            | <u>ALO-Cadre</u> |           |          |          | <u>TDA-ATC</u> |           |          |          | <u>Total</u> |            |              |              |
|------------------------|------------------|-----------|----------|----------|----------------|-----------|----------|----------|--------------|------------|--------------|--------------|
|                        | <u>O</u>         | <u>WO</u> | <u>E</u> | <u>I</u> | <u>O</u>       | <u>WO</u> | <u>E</u> | <u>I</u> | <u>O</u>     | <u>WO</u>  | <u>E</u>     | <u>I</u>     |
| Cadre Armor Div        | 723              | 181       | 3,628    | 4,532    | -              | -         | -        | -        | 723          | 181        | 3,628        | 4,532        |
| 100th ATC<br>(5th Bde) | -                | -         | -        | -        | 66             | 3         | 486      | 555      | 66           | 3          | 486          | 555          |
| <b>Total</b>           |                  |           |          |          |                |           |          |          | <b>789</b>   | <b>184</b> | <b>4,114</b> | <b>5,087</b> |

**Figure 5**

**Cadre Armor Division  
W/ATC TDA Brigade & Division Combat Ready Brigade**

| <u>Unit</u>        | <u>ALO-Cadre/TDA ATC</u> |           |          |          | <u>ALO-1</u> |           |          |          | <u>Total</u> |            |              |              |
|--------------------|--------------------------|-----------|----------|----------|--------------|-----------|----------|----------|--------------|------------|--------------|--------------|
|                    | <u>O</u>                 | <u>WO</u> | <u>E</u> | <u>I</u> | <u>O</u>     | <u>WO</u> | <u>E</u> | <u>I</u> | <u>O</u>     | <u>WO</u>  | <u>E</u>     | <u>I</u>     |
| Cadre Div<br>w/ATC | 789                      | 184       | 4,114    | 5,087    | -            | -         | -        | -        | 789          | 184        | 4,114        | 5,087        |
| Div Cbt Ready Bde* |                          |           |          |          |              |           |          |          |              |            |              |              |
| 1st Ar Bde         | -                        | -         | -        | -        | 58           | 6         | 1,191    | 1,255    | 58           | 6          | 1,191        | 1,255        |
| 1 ea FA Bn         | -                        | -         | -        | -        | 33           | 0         | 539      | 572      | 33           | 0          | 539          | 572          |
| 1 ea FSB           | -                        | -         | -        | -        | 3            | 3         | 307      | 313      | 3            | 3          | 307          | 313          |
| 1 ea EN Plt        | -                        | -         | -        | -        | 4            | 1         | 256      | 261      | 4            | 1          | 256          | 261          |
| 1 ea ADA Co        | -                        | -         | -        | -        | 1            | 1         | 182      | 184      | 1            | 1          | 182          | 184          |
| 1 ea MP Co         | -                        | -         | -        | -        | 1            | 0         | 39       | 40       | 1            | 0          | 39           | 40           |
| <b>Total</b>       |                          |           |          |          |              |           |          |          | <b>889</b>   | <b>195</b> | <b>6,628</b> | <b>7,712</b> |

\*Differential sum, i.e. cadre versus ALO 1 for each element.

**Figure 6**

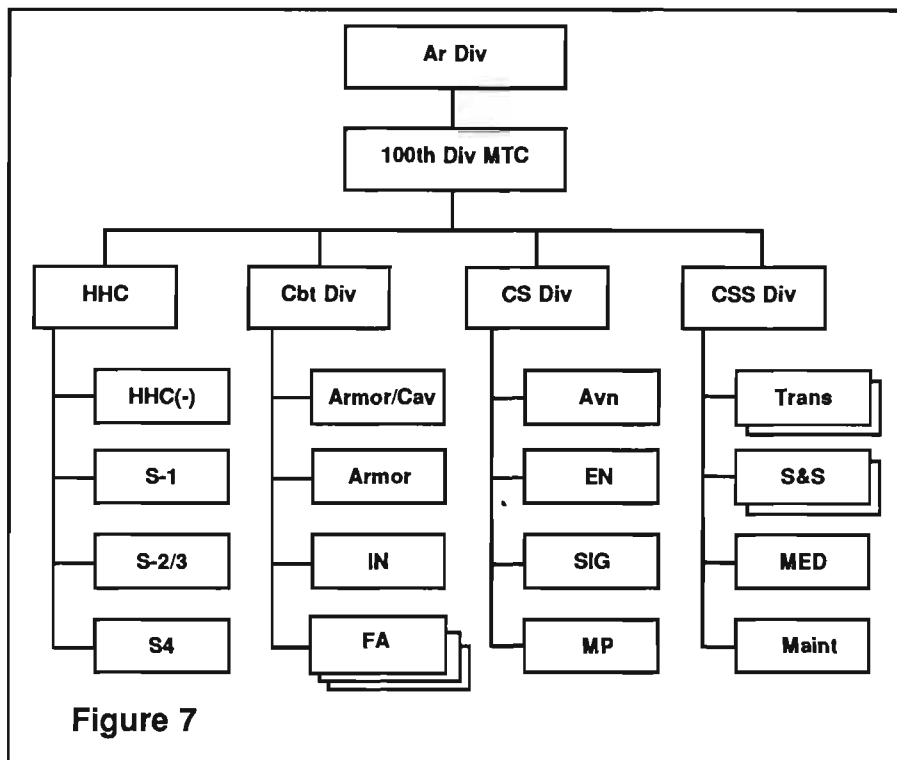
(both existing TO&E and TDA units, i.e., cadre-level maneuver battalions).

Training will be conducted in three phases:

- First (1-3 years): Emphasis will be on in-house basic TO&E maneuver unit organization and tactical operations. Training will be conducted, as much as possible, with readiness groups and mobile training teams and maneuver training commands for command post exercises (CPX/First Battle: Battalion-Corps-type training).

- Second (4-6 years): Small unit (platoon or company/troop) tactical training conducted during both Inactive Duty Training and Annual Training. All training will be executed to applicable ARTEP/MTP tasks, standards, and conditions. Additionally, as skills increase, gunnery — both live fire and Unit Conduct of Fire Trainer (UCOFT) — will be integrated into training plans.

- Third (7-9 years): CPX and tactical training at the battalion/squadron and brigade level, plus tank gunnery, to be conducted during Annual Training. Inactive Duty Training focus will be on simulation exercises, i.e., FB:BC and Simulation Network (SIMNET). At this phase, the units may conduct their Annual Training at one of the national train-



ing centers (Fort Irwin, Fort Chaffee, or even Hohenfels) or as part of a REFORGER-like operation.

In all of the phases of training, both sustainment of basic soldier individual skills and intra/inter-phase refresher training will be conducted. This will be done to ensure the maximization of knowledge and operational utilization of both the soldiers and the division.

Post-mobilization training for armor training center units will not change. However, they will develop a contingency plan in case they are needed to round out existing divisional battalions or squadrons or assume the 1st Brigade mission if it is used independently. Remaining division training will be based on personnel and equipment fill schedules rather than training time required and deployment date.

A unique training asset available to the 100th Division (Training) is the 100th Division Maneuver Training Command (100th Div. MTC). This Second Army asset, currently co-located with the 100th Division (Training) headquarters and OPCON to it for personnel, financial, and limited logistical support, consists of 19

teams in all three Army disciplines, CBT, CS, and CSS. Figure 7 shows the organizational composition of the 100th Div. MTC. This organization, for the past 16 years, has conducted the planning, development, execution, and evaluation of all types of training exercises up to brigade level for military organizations within both the Second and Fourth U.S. Army areas. Therefore, I further propose that, while the overall mission of the 100th Div. MTC not be changed, its focus through emphasis from FORSCOM and TRADOC be placed on the 100th while it develops as a combat division. As assisted by Readiness Group Knox, the MTC will develop exercises emphasizing technical, tactical, and leadership skills required to successfully execute combat missions, if not exclusively, primarily for the 100th Division.

Logistical support for this organization will be guided by the following principles:

- Organizational Clothing and Individual Equipment, i.e., CTA 50-901, is already issued or on hand in all units at required quantity levels.

- Installation property, again, is on hand but may require redistribution.

- Installations will be consolidated based on final TO&E unit utilization or location.

- Existing Mobilization and Training Equipment Sites use will be maximized for the storage and training availability of major end items.

- Existing tactical equipment will be cross-leveled, and equipment will be requisitioned based on the difference between on-hand status and authorized level per that unit's ALO.

Equipment to round out the cadre division after mobilization will come from the following sources:

- Prepositioned Organization Materiel Configured in Unit Sets (POMCUS) Unit Residual Equipment (PURE).

- New manufacture.

- Theater of War/Operations Division Sets.

- Combination of all of the above.

The cost of implementing this concept, based on Headquarters, DA, Manpower and Force Program Analysis Division, Program Analysis and Evaluation Directorate data is approximately nine to 24 percent of the total cost for an AC heavy division. (See Figure 8.) The cost of a "pure" RC cadre heavy division is the least expensive; however, as stated earlier, its effectiveness is also minimal. It would take it the longest to become combat ready and would not have the capability to displace or augment trainers in the training base. An RC heavy division would be the most expensive and would still not be the best prepared to go to war, nor possess the capability to support the training base. The use of an RC cadre w/ATC is approximately \$2.5 million more expensive than the RC cadre, but it can support the training base. However, it still cannot meet combat readiness criteria in a timely manner. The third option,

**AC Heavy Division Versus  
RC Cadre Heavy (Armor) Division  
Annual Costs<sup>1</sup> (in millions)**

|                          | <u>AC</u>     | <u>RC</u>     | <u>RC,<br/>Cadre</u> | <u>RC, Cadre<br/>W/ATC Bde</u> | <u>RC, Cadre<br/>W/ATC Bde<br/>&amp; Div Cbt Bde</u> |
|--------------------------|---------------|---------------|----------------------|--------------------------------|--|
| Personnel                |               |               |                      |                                |  |
| AC                       | 435.11        | -             | -                    | -                              | -  |
| RC <sup>2</sup>          | -             | 134.9         | 38.38                | 38.38                          | 38.38  |
| Civilians <sup>3</sup>   | -             | -             | 5.25                 | 5.25                           | 5.25   |
| ATC Bde <sup>4</sup>     | -             | -             | -                    | 3.05                           | 3.05   |
| Div Cbt Bde <sup>5</sup> | -             | -             | -                    | -                              | 14.44  |
| OPTEMPO                  | <u>108.79</u> | <u>15.23</u>  | <u>5.07</u>          | <u>5.07</u>                    | <u>25.35<sup>6</sup></u>                             |
| <b>Total</b>             | <b>543.90</b> | <b>150.13</b> | <b>48.70</b>         | <b>51.75</b>                   | <b>86.47</b>   |

**Notes:**

<sup>1</sup>Data from Cadre Division Concept Study (Draft), Department of the Army, DAMO-SSW, dated 15 Jul 90.

<sup>2</sup>Includes TPU, AGR, and AC personnel.

<sup>3</sup>Includes GS and FTS civilians. Number required was based on 100th Division (Tng) manpower level (73) plus 72 since data is currently unavailable for other concept units. Calculation is as follows: 73+72x35K divided by 1M=5.25.

<sup>4</sup>Based on current 100th Div (Tng) 2d Bde TDA authorization. Calculation is as follows: 555x5.5K divided by 1M=3.05.

<sup>5</sup>Additional 2,625 personnel required for 1st Cadre Bde to make it ALO 1. Calculation is as follows: 2,625x5.5K divided by 1M=14.44.

<sup>6</sup>Calculation based on 25% cadre fill (personnel and equipment), i.e. 5.07 divided by 25=20.28+5.07 (cadre)=25.35.

**Figure 8**

cadre with division combat ready and ATC brigade, is approximately \$38 million more expensive than the RC cadre division, but \$70 million less than the RC heavy division. These differentials are significant and justify the expense for a unit that would be capable to meet both its pre- and post-mobilization armor training center trainer mission, plus provide an additional on-line combat unit source.

**Conclusion**

AirLand Battle Future Doctrine, current utilization/deployment strategy, plus the evolution of a new world order dictate the reevaluation of tactical, operational, and strategic employment of United States Armed Forces. The rapid technological growth and the effectiveness of weapons systems and training methodology for soldiers, coupled with fiscal constraints, makes realigning costly combat-heavy forces

inevitable. This realignment could take place and minimize the overall loss of combat effectiveness by placing specific heavy combat divisions at a cadre level of organization in the United States Army Reserve. By using selected USAR training divisions as "core" elements, the training base would not be adversely affected. In fact, they would continue to contribute to the training base because their mission would now be both the training of initial entry trainees and combat preparedness. An additional benefit of this concept is that it will provide a connection between the use of National Guard reinforcing combat forces and the next level of current mobilization, which is creating completely new combat divisions.

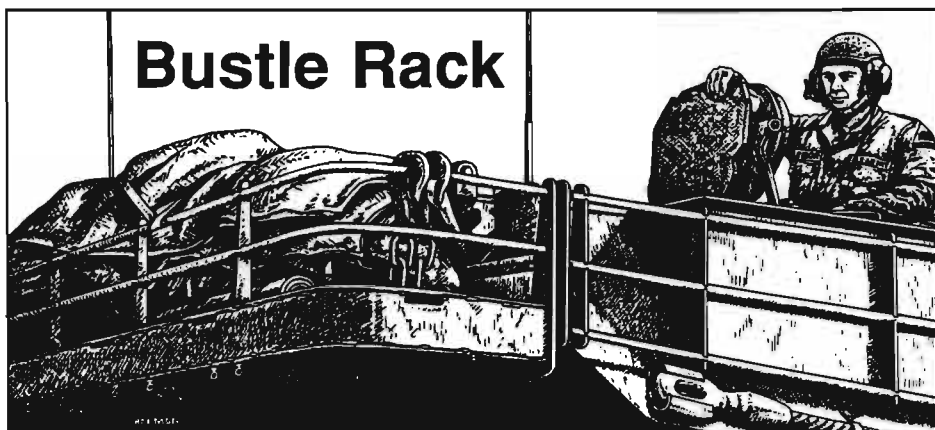
Moreover, this method will provide a way to bring force levels down without compromising the combat power of existing AC divisions. Regardless of mission, either forward de-

ployed or contingency, no AC Army division would be organized either in personnel or equipment at less than fully combat ready — there will be no skeleton combat AC divisions. In fact, even the "cadre" divisions, as this concept shows, could be organized either pure or with elements having a varying degree of combat readiness. The degree to which this would be done would obviously be dependent on both threat analysis and other constraints, like personnel, equipment, or fiscal.

The risks involved in this concept are not minimal. However, if reaction lead times are accurate, and cadre divisions can become combat-ready within those lead times, this concept should be considered seriously as an acceptable risk.

Colonel Joseph C. Kopacz was commissioned from Armor Officer Candidate School, and has attended Armor Officer Advanced School and CGSC. He attended John Carroll University and holds a B.S. degree in marketing from the University of Louisville. He served as a platoon leader and S4/PBO with 2-68 Armor, 8th ID (Mech); Asst G3, 100th Div (Tng); S2/3, 100th Div Support Bn; Armor/Cavalry team leader, 100th Div Maneuver Training Command; squadron commander, 1-397th, 3d Bde, 100th Div (Tng); and as chief, Plans, Operations, Training, RM, and MOB Division, 100th Div Maneuver Command. As a civilian, he is a marketing management/financial planner.

## Army Begins New SDT in January



The Army's new Self-Development Test (SDT) is here. Testing of noncommissioned officers in the grades of sergeant through sergeant first class was scheduled to begin in place of the Skill Qualification Test on 1 Oct 91. Delays in publications shipments, however, have postponed that start date to 1 Jan 92.

The SDT is designed to evaluate leadership, training, and MOS skills. To sustain doctrinal proficiency in these areas, NCOs are required to know the material in their MOS-specific soldier's manual and any job-related technical references.

To strengthen proficiency in the leadership and training areas, NCOs taking the SDT are required to know the material in four additional manuals: FM 22-100, Military Leadership; FM 22-101, Leadership Counseling; FM 22-102, Soldier Team Development; and FM 25-101, Battle Focused Training. These publications were distributed as a set to each installation and major command, worldwide. The manuals were distributed in sufficient quantities to allow a personal set for every sergeant through sergeant first class, with a 20 percent excess to allow for new promotions, etc. Only NCOs in grades sergeant through sergeant first class should receive the packaged set. The manuals become the soldier's personal set and should be accounted for on the permanent clothing record.

Mass shipment of the manuals, by sets, ended 19 Sep 91. If you or your NCOs have not received your set of manuals, check with your local publication officials to see if they have been distributed. If your manuals were distributed so that all sergeants through sergeants first class did not receive a set, new manuals will have to be requisitioned individually through normal channels. POC for more information is the Directorate of Total Armor Force Readiness, DSN 464-TANK, or commercial (502) 624-TANK.

### Simulation Proponency Office For Armor Training Devices

The Simulation Proponency Office (SPO) within the Directorate of Training Develop-

ment is open for business. The mission of the SPO is to be the Armor Center's point of contact for information and analysis of Armor training aids, devices, simulators and simulations (TADSS) and integration of TADSS into training.

As the Armor Center's simulation proponent, SPO provides:

- proponency for TC 17-12-7, The Battle Focused Combined Arms Training Strategy: Armor — the centerpiece document for the integration of TADSS into training strategies for the Total Armor Force (TAF) (institution, Active and Reserve Component).

- expertise on training device application, capability and limitation. Preparation and presentation information and update briefings on Armor TADSS and the Combined Arms Training Strategy: Armor.

- advice and information on TADSS to the director, deputy assistant commandant, assistant commandant, and commanding general.

- USAARMS' position or actions affecting Armor non-systems and systems TADSS.

- simulation proponency in the development of Fort Knox as a regional training center.

- an analytical capability to monitor, advise, and participate in training related studies and tests. Further, conduct training development studies, abbreviated analysis, trade off analysis, and training impact analysis in support of TADSS and proponent system acquisition.

- coordination with other schools, integrating centers and MACOMs concerning TADSS development, acquisition, and integration for combined arms training.

- identification of secondary application of TADSS that enhance warfighting capability during actual combat operations.

This brief introduction to the Simulation Proponency Office is intended to raise the reader's awareness of the office and its missions. The staff welcomes your questions or comments. The mailing address is: USAARMS, ATTN: ATSB-TDN-O (Simulation Proponency Office), Fort Knox, Ky.

40121-5200, or phone DSN 464-3982/3881, commercial (502) 624-3982/3881.

### Final Draft of FM 71-123 — How We Fight

The U.S. Army Armor School printed the final draft of FM 71-123, Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion/Task Force, and Company/Team, in June 1991. The present plan for FM 71-123 is to incorporate its contents into FM 71-1, FM 71-2, and FM 71-3 and not to go to "DA" print with this version. All future field manuals will contain three parts, doctrine, tactics and techniques, and standing operating procedures. Due to funding, only a limited number of FM 71-123s were printed. The Armor School mailed a copy of this manual to every armor and mechanized battalion and above, Active, Reserve, and National Guard. The remainder of the manuals are for instructional purposes. Because there are a limited number of manuals, local reproduction is permitted and encouraged.

FM 71-123 reflects the way we fight. The manual encompasses three echelons: brigade, battalion, and company. This approach allows the reader to understand the relationships of the echelons to each other. Troop-leading procedures provide a thread of continuity, leading a reader chronologically through each mission. Planning, preparation, and execution are addressed in turn, to reinforce the staff planning process and illustrate the interaction necessary between commanders and staff. Accordingly, planning, preparation, and execution of each mission are further described in terms of the seven battlefield operating systems. This structure gives the manual a unique combined arms perspective, which encapsulates the activities of each of the arms, as well as its relationship to the overall operation.

FM 71-123 is designed as a thought-provoking professional resource. It may serve as a point of departure for professional development classes or as a basis for training. Above all, it is a living document to be read and improved as soldiers in the field

develop new and innovative techniques. Comments and suggestions are encouraged. Send them to Commandant, USAARMS, ATSB-CSC (ATTN: CPT True), Fort Knox, Ky. 40121-5200 or call DSN 464-2319/6651, commercial (502) 624-2319/6651.

### History of Unit Coin

The Armor School's Professional Development Division (PDD) is interested in developing a history of the unit coin, sometimes called a challenge coin. PDD is especially interested in the origin of the unit coin; its introduction into the U.S. Army; its uses, either as an immediate reward for a job well done or as a means of justification of membership; and the various rules of "challenge" that have developed around it. The various designs of such coins are also of great interest.

If you have any information regarding the unit coin and its traditions, please notify SFC Broom or MAJ Norfolk at Command and Staff Department, U.S. Army Armor School, ATTN: ATSB-CSP-L, Fort Knox, Ky. 40121-5211, or phone DSN 464-3420/5450, commercial (502) 624-3420/5450.

Any documents, photographs, or actual examples of the coin would be greatly appreciated. All such documents, photographs, and coins will be deposited at the Patton Museum, at Fort Knox, Ky. They will be credited to the donating party or unit.

### Brandy Station Battlefield In Danger

On June 9, 1863, as a prelude to the Gettysburg Campaign, Union cavalry under MG Alfred Pleasonton, managed to surprise the scattered brigades of MG J.E.B. Stuart's cavalry near Brandy Station, Va. The desperate battle that ensued was a classic cavalry fight — sabre-wielding cavalymen charging and countercharging amidst clouds of dust, and the largest cavalry battle of the Civil War.

Today, the historic fields on which the battle was fought are threatened with the prospects of commercial development.

If you want to find out how you can help preserve this part of cavalry history, contact the Brandy Station Foundation at P.O. Box 165, Brandy Station, Va. 22714, or call (703) 825-9433. — Ed.

### Armor Officer Writing History of the Armored Force, 1940-1945

Major Kevin McKedy seeks information and materials from Armored Force veterans

## Senior Officer Logistics Management Course (SOLMC)

SOLMC is specifically designed to update commanders and their primary staff at the battalion and brigade level in the logistics arena. For more information, contact the SOLMC staff, DSN 464-7133/3411 or commercial (502)624-7133/3411. The principal point of contact for administrative information and enrollment procedures is Maintenance Department Support Section, DSN 464-1755 or commercial (502) 624-1755.

### SOLMC Schedule (Course Number 8A-F23)

| <u>Class Number</u> | <u>Report Date</u> | <u>Start Date</u> | <u>End Date</u> |
|---------------------|--------------------|-------------------|-----------------|
| 2                   | 5 Jan 92           | 6 Jan 92          | 10 Jan 92       |
| 3                   | 28 Jan 92          | 27 Jan 92         | 31 Jan 92       |
| 4                   | 1 Mar 92           | 2 Mar 92          | 6 Mar 92        |
| 5                   | 29 Mar 92          | 30 Mar 92         | 3 Apr 92        |
| 6                   | 5 Apr 92           | 6 Apr 92          | 10 Apr 92       |
| 7                   | 26 Apr 92          | 27 Apr 92         | 1 May 92        |
| 8                   | 10 May 92          | 11 May 92         | 15 May 92       |
| 9                   | 14 Jun 92          | 15 Jun 92         | 19 Jun 92       |
| 10                  | 20 Sep 92          | 21 Sep 92         | 25 Sep 92       |
| 1                   | 4 Oct 92           | 5 Oct 92          | 9 Oct 92        |
| 2                   | 3 Jan 93           | 4 Jan 93          | 8 Jan 93        |
| 3                   | 7 Feb 93           | 8 Feb 93          | 12 Feb 93       |
| 4                   | 21 Mar 93          | 22 Mar 93         | 26 Mar 93       |
| 5                   | 11 Apr 93          | 12 Apr 93         | 16 Apr 93       |
| 6                   | 25 Apr 93          | 26 Apr 93         | 30 Apr 93       |
| 7                   | 9 May 93           | 10 May 93         | 14 May 93       |
| 8                   | 23 May 93          | 24 May 93         | 28 May 93       |
| 9                   | 27 Jun 93          | 28 Jun 93         | 2 Jul 93        |
| 10                  | 12 Sep 93          | 13 Sep 93         | 17 Sep 93       |

## Battalion Motor Officer Course

The Battalion Motor Officer Course (BMOC) is designed to prepare officers for assignment to positions which have directly related maintenance responsibilities at the unit level (battalion/squadron and below) with emphasis on management and supervisory operations. The course encompasses maintenance management, repair parts supply, troubleshooting, recovery operations, and scheduled maintenance services. The course is open to Active Army and Reserve Component captains, first lieutenants, and second lieutenants who have completed the Basic Course and have been in the field more than six months, warrant officers, and officers of Allied nations. The four-week course is conducted 19 times each fiscal year at Fort Knox, Ky. Class quotas can be obtained through normal Army Training and Doctrine Command channels. For more information, contact CW3 Delaquis, DSN 464-8119/8510 or commercial (502) 624-8119/8510.

### BMOC Schedule (Course Number 8C-F21)

| <u>Class Number</u> | <u>Report Date</u> | <u>Start Date</u> | <u>End Date</u> |
|---------------------|--------------------|-------------------|-----------------|
| 003                 | 8 Jan 92           | 10 Jan 92         | 7 Feb 92        |
| 004                 | 30 Jan 92          | 3 Feb 92          | 3 Mar 92        |
| 005                 | 13 Feb 92          | 18 Feb 92         | 17 Mar 92       |
| 006                 | 28 Feb 92          | 3 Mar 92          | 31 Mar 92       |
| 007                 | 13 Mar 92          | 17 Mar 92         | 14 Apr 92       |
| 008                 | 27 Mar 92          | 31 Mar 92         | 28 Apr 92       |
| 009                 | 10 Apr 92          | 14 Apr 92         | 12 May 92       |
| 010                 | 23 Apr 92          | 27 Apr 92         | 22 May 92       |
| 011                 | 7 May 92           | 11 May 92         | 9 Jun 92        |
| 012                 | 20 May 92          | 22 May 92         | 19 Jun 92       |
| 013                 | 4 Jun 92           | 8 Jun 92          | 7 Jul 92        |
| 014                 | 18 Jun 92          | 22 Jun 92         | 21 Jul 92       |
| 015                 | 17 Jul 92          | 21 Jul 92         | 18 Aug 92       |
| 016                 | 6 Aug 92           | 10 Aug 92         | 4 Sep 92        |
| 502                 | 20 Aug 92          | 24 Aug 92         | 22 Sep 92       |
| 503                 | 10 Sep 92          | 14 Sep 92         | 9 Oct 92        |

# Armor Branch Notes

by LTC Fred A. Treyz III

of World War II. Major McKedy, an assistant professor of military history at West Point, who served with 4-66 Armor in Operation DESERT STORM, is currently conducting research on Armored Force units in preparation of his doctoral dissertation, "The Evolution of American Armored Doctrine, 1940-1945."

His dissertation will analyze American armor doctrine during WWII by examining the organization, tactics, training, equipment, and combat actions of armored divisions and separate tank battalions in North Africa, Europe, and the Pacific. Major McKedy is interested in interviewing Armored Force veterans about their experiences in training and combat.

Any veteran interested in assisting Major McKedy in preparation of this important historical project should contact him at the Department of History, United States Military Academy, West Point, N.Y. 10996. His daytime phone is (914)938-5084/3561; DSN 688-5084.

## 4th AD Dedicates Wood Hall

Some 550 4th Armored Division veterans and their family members made the trip to Fort Knox on August 23 to dedicate Wood Hall in honor of their WWII commander, MG John Shirley "P" Wood.

Comprising the ceremony was the unveiling of a portrait of General Wood, a bronze plaque, and an M-4 Sherman tank named in his honor. The portrait and other memorabilia are to be displayed in the building's conference room, through which every soldier training as a tanker or scout will pass.

In his remarks, BG (Ret.) Albin F. Irzyk, wartime commander of the division's 8th Tank Battalion, said, "If you want to try to answer the question, what is leadership, throw away the books and study General Wood. No division commander ever loved his men as did General Wood and was loved in turn by his men."

Later, at a luncheon, Armor School Assistant Commandant BG James Noles told the group, "I want you to know that you are our heroes. We in today's Army are indebted to you for the legacy built by the Fourth Division and its first great wartime commander, John "P" Wood. You defined the role of the Armored Force in terms of firepower, shock effect, and movement, movement, movement."

Wood Hall is part of the Holder training facility at Fort Knox. The event was part of the 4th AD Association's 50th anniversary reunion.

In the few months since assumption of duty as your Armor Branch Chief at PERSCOM, I can report that the Armor Force is out in front! We have a force of dedicated tankers and cavalymen with unmatched quality and leaders who demonstrate care and compassion by their actions, not just words. This makes our branch special — a tight-knit community of WARFIGHTERS!

I feel I would be remiss in my duties if I would not share with you the feelings in my heart concerning our officer corps. These are challenging times — the veil is starting to lift on the specific issues resulting from the Army's drawdown via a Selective Early Retirement Board (SERB) and a Reduction In Force (RIF). These times will require a tremendous sense of care and compassion for our officers, soldiers, and their families. The other part of the drawdown plan is the early release of officers through the Voluntary Early Release/Retirement Program (VERRP). Armor leaders in the field need now take particular heed! Now is the time to strongly encourage and recruit officers who possess the talents and potential distinctive to Armor Branch to stay in the Army. On the other hand, now is the time to be sober and truthful in dealing with officers who do not possess the same potential and talents. These officers should be encouraged to take advantage of the incentives of available release programs. This way our branch will keep intact the high quality force that we've come to expect.

In the months ahead, no one can afford to be too busy to take 10-15 minutes at their Personnel Services Company or on the phone with Armor Branch to ensure that their files are presented in the best light to board members. Brigade, battalion and squadron adjutants need to work extra hard to assist their officers, and we at Armor Branch will help. Leaders everywhere need to weigh in as mentors, and officers who are in doubt should call upon them for advice in these challenging times.

Armor Branch personnel are as follows (DSN: 221-9696 or commercial (703) 325-9696):

|                     |                        |                       |
|---------------------|------------------------|-----------------------|
| Armor Branch Chief: | LTC Fred A. Treyz, III |                       |
| LTC Assignments:    | LTC Larry Brom         | Ms. Patsy Edmonds     |
| MAJ Assignments:    | MAJ Tom Piskel         | Ms. Mary Mooney       |
| CPT Assignments:    | CPT Steve Stalvey      | CPT John Kallerson    |
|                     | Ms. Robin Harper       | Ms. Ruby Bourne       |
| LT Assignments:     | CPT Chuck Honore       | Ms. Margo Bertagnolli |
|                     | Ms. Mary Fowler        |                       |
| Future Readiness:   | CPT Schuy DeCamp       |                       |

## Upcoming Boards

|                    |                 |
|--------------------|-----------------|
| COL SERB           | 14-31 Jan 92    |
| LTC, MAJ, CPT SERB | 14-Jan-7 Feb 92 |
| LTC FY93 Cmd       | 3-30 Feb 92     |

Because the RIF Board could come at any time, it is imperative for each officer to review his file and correct any deficiencies. We at Armor Branch need your help to keep your file REDCON 1.

## 1992 Professional Development Program Deadlines

To get considered for professional development programs outside the normal realm of Armor, we must submit your file for consideration within the following deadlines:

|                              |           |             |
|------------------------------|-----------|-------------|
| Congressional Fellow         | 10 Jan 92 | (Summer 92) |
| Training With Industry (TWI) | 25 Jan 92 | (Summer 92) |
| Harvard/DCSOPS Fellow        | 1 Sep 92  |             |
| Olmstead Scholarship         | 1 Oct 92  |             |
| USUHS Applications           | 1 Nov 92  |             |
| FLEP Applications            | 1 Nov 92  |             |
| White House Fellow           | 1 Dec 92  |             |

*Continued on Page 51*



## Armor Branch Notes *(Continued from page 50)*

### Selective Early Retirements Boards (SERB)

The FY 92 SERB message, dated 182300Z Nov 91, will select officers with 18 years Active Federal Service (AFS) for early retirement. We encourage each of you to obtain a copy of the message from your Personnel Services Company for details, as well as ensure your file is REDCON 1. By law, the selection rate for early retirement cannot exceed 30 percent. Officers selected will retire on the first day of the month following the month the officer completes 20 years Active Federal Service, and will retire in their current grade.

### Army Acquisition Corps (AAC)

The AAC is designed to develop a pool of highly qualified specialists to fill designated critical acquisition positions, while ensuring that the development of systems reflects a balance between keen regard for operational realities and technical knowledge. A key goal of the AAC is to develop officers by assigning them to positions allowing work on branch developmental programs, eventually becoming a project manager or commander of a Defense Logistics Agency Procurement Command (defense plant or defense contract management area). Acquisition Corps officers are not eligible for consideration for Armor battalion command.

Each developmental project is aligned to a basic branch and is determined by an annual General Officer Steering Committee. For example, the AGS development is currently aligned with Armor, so Armor officers accessed into the AAC are developed to become the AGS Project Manager. Armor currently is aligned with seven LTC PM positions and five COL PM positions, and officers can compete for 21 LTC commands and 23 COL commands.

To get into the AAC, an officer must be branch qualified, be competitive for promotion to the next higher rank, possess a functional area of 51, 53 or 97, have a scientific, engineering, business, or administration degree background, a GPA of 2.8 or higher, and have GRE/GMAT scores which will allow Advanced Civil Schooling (ACS). Of these requirements, only competitiveness for promotion cannot be waived, so officers with other functional areas may also redesignate their functional area and enter the AAC. As with normal ACS, a good GRE/GMAT score can offset a poor GPA.

Armor is currently short in all year groups, and we intend to make up these shortages by the next PERSCOM Acquisition Accession Board (PAAB) in Fall 92. Hopefully, we can fill all the vacancies through voluntary accessions. If interested, write your assignment officer to get your file seen by the PAAB. For more information on the AAC, call MAJ Mark Brown, the 97 AAC Assignment Officer, at AV 221-2758. He is an Armor officer in the Acquisition Corps and can answer your questions.

### Microfiche

Your performance microfiche is the final item in your board file (other than loose papers such as last minute OERs). Each officer should order a fiche if you have not done so in the last year. Check to ensure only your OERs and AERs are on the fiche. Alert us if you note problems. To order your fiche, write to: Commander, PERSCOM, ATTN: TAPC-MSR-S, 200 Stovall St., Alexandria, Va. 22332. Be sure to include your SSN and return address on the letter.

### Photograph

Although official photographs are required every five years, it is advisable to retake a photo upon promotion. We continually stress the importance of a good photo, and comments from DA Board members also emphasize its importance.

Black and white photos will be used exclusively for DA Boards until 1 Feb 92. After this date, color photographs will be used for all DA Selection Boards, but each board will be cautioned that not all officers will have a color photo and that a black and white photo will be sufficient. DA will advise the field when boards will only review color photos. A word of caution — pay more attention to detail when taking a color photo. Flaws in the uniform, such as different shades in coat and trousers, award placement and wrinkles in the uniform, tend to show up more in color than in black and white.

### ORB

A correct, easy-to-read ORB is also important for a board. Check your ORB now, even if you just went through a birth-month audit. Ensure corrections you submitted are present, and if not, try again. Captains, majors and lieutenant colonels tend to have problems in the assignment history section, and lieutenants tend to have problems in the assignment history, service data and awards sections. All ranks have problems with updated home addresses. If you cannot resolve a problem with your ORB, send us corrections needed with any necessary supporting documents.

## Bustle Rack

*(Continued from Page 50)*

### Patton Museum Adds Abrams Auditorium

On July 12, the Cavalry Armor Foundation signed a contract for the Abrams Auditorium wing of the Patton Museum. Construction of the fifth major addition to the museum is underway and should be well out of the ground as this goes to press. Designed as a multifunction area for classes, temporary exhibits, and meetings, the auditorium will be completed by spring of 1992. It will be dedicated to General Creighton W. Abrams, the first Chief of Staff to have Armor as his basic branch.

### Reunions

The Society of the First Division (Big Red One), will hold its 74th Annual Reunion from August 26-30, 1992, in Chicago, Ill. For information, please contact Arthur L. Chaitt, Executive Director, 5 Montgomery Avenue, Philadelphia, Pa. 19118, phone (215) 836-4841.

### Smoke/Obscurants Symposium XVI

The Smoke/Obscurants Symposium XVI will be held 14-16 April 1992 at the Kossiakoff Conference and Education Center, The Johns Hopkins University, Laurel, Md. The theme of the Symposium is "Smoke, the Margin of Victory." Topics to be presented are Smoke Systems and Materials, Modelling, Operational Uses, Health or Environmental Effects, DESERT STORM Lessons, Countermeasures, Nonmilitary Applications, Data Analysis, Data Assessment and Evaluation, Camouflage, Concealment, Deception, Natural Obscurants, and Electromagnetic Systems Performance. The symposium is sponsored by the U.S. Army Chemical Research, Development and Engineering Center, Aberdeen Proving Ground, Md. Members of the Department of Defense, industry, academia and allied nations are invited to submit papers up to and including the SECRET level on the aforementioned topics. The abstract deadline is 15 January 1992.

For further information contact Judy Cole, Symposium Coordinator (804) 865-7604 and telefax (804) 865-8721; or Walter Klimek, Symposium Chairman (301) 671-2494, DSN 584-2494, or telefax (301) 671-3471.

## New Book on Gulf War Combines Wealth of Detail With Clear View of the Big Picture

**Desert Victory: The War for Kuwait**, by Norman Friedman. Naval Institute Press, Annapolis, 1991, 435 pp. \$24.95

It is difficult enough to put a war and a major national experience in perspective at all, so it is surprising that defense analyst Norman Friedman does it here so quickly and so well. Beyond that, the broad strokes are filled in with a wealth of detail that help even specialized readers understand how complex weapons work and how they must be orchestrated if a nation is to succeed in modern war.

This book is a remarkably mature look at the Gulf War big picture, arriving very soon after the end of the conflict. It successfully explains why so many experts were wrong about this war, and to a great extent why we shouldn't have been as surprised as we were by its outcome.

The book follows a chronological path, beginning with a detailed, compact chapter on Saddam Hussein's Iraq, followed by other chapters on his invasion of his southern neighbor, the forging of the coalition, the embargo, the build-ups in Saudi Arabia and in Kuwait, and the military considerations that commanders on both sides had to face. Succeeding chapters deal with the air war, the naval contribution, the land campaign, and a final chapter on "lessons learned and mis-learned."

The 260 pages of text are followed by a 103-page appendix section that analyzes land, sea, and air weapons systems on both sides, lists air and naval losses and how they occurred, and documents each SCUD launching and its outcome. Friedman's clear explanations of weapons and how they work make the appendices a major strength of the book. But equally interesting are his conclusions, including some I'd never heard from the many experts who quarterbacked the war from TV's sidelines. Why the Iraqi Air Force didn't

fight, for example. Friedman argues that Saddam was actually afraid of his air force; it was one of the few power centers that could actually challenge his control of his country, so he denied it resources, and its morale was never good. He also argues that we overestimated his forces because we were counting weapons, rather than assessing the will of the men behind them. He argues further that when we looked at Saddam's lavish weapons purchases, we

failed to notice that he didn't really buy the redundancy and spare parts that make systems robust; these glitzy weapons were purchased more to intimidate than to fight. And once the coalition shattered the Iraqi command and control system, it should have been no surprise that Saddam's hollow legions completely lost whatever shreds of cohesion they might have had.

JON CLEMENS, ARMOR Staff

### *Cogent Quotes from "Desert Victory"*

"Saddam managed to buy a great deal of the outward appearance of military power — the guns and tanks and missiles. He was unable to buy, or to maintain, a modern command and control system to back up that outward power."

"Inexperienced armies, or, more likely, inexperienced dictators will choose the maximum apparent military power per dollar. Most of the time, after all, they expect to win more by bluffing than by actually fighting. It is tempting for the United States to follow much the same path as the military budget declines. The war demonstrates clearly just how bad a mistake that would be."

"To some extent, it could be argued that Saddam Hussein's tactical, training, and logistical failures were a result of the limited cadre of educated men in Iraq; that is, they were a consequence of Iraq's Third World character...To the extent that such generalizations are correct, the war carries a fascinating lesson: Third World countries are unlikely to defeat reasonably competently handled First World forces unless they modernize their societies — that is, unless they emerge out of the Third World. Mere purchases of sophisticated weaponry will not do..."

"It is quite possible that, for all of its mobilization, Iraq lacked sufficient numbers of educated men outside its officer class. The next best method is to decentralize, relying heavily on officers in forward positions, whose knowledge of the current situation can make up for the lack of information at headquarters. Saddam rejected this sort of plan for fear of political instability."

"The great lesson is that any society wishing to stand up to modern Western forces will have to modernize. It cannot merely buy equipment; the society itself has to change. The change need not mimic the West (probably it will not), but it must produce a larger leadership and technically adept class...."

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**Fire in the Streets, the Battle for Hue, TET 1968**, by Eric Hammel. Contemporary Books, Inc., Chicago, 1991. 370 pages. \$24.95.

Hundreds of books, articles, and studies have been written about the events of TET 1968, to explain, condemn, and justify what took place. This book, refreshingly, spends most of its efforts on the battles waged by the units involved. It primarily covers "our" side of the hill, as it was obviously impossible to obtain the detailed interviews and documentation from "their" side of the hill.

The real heroes of the story of Hue during TET 1968 have to be the three U.S. Marine battalions — 1/1, 1/5, and 2/5 — whose battle prowess is displayed in detail in this book. The conditions under which they were forced to fight were daunting, to say the least. The intelligence of the enemy, they gained largely by combat action; much of the time artillery and air support was denied them by policy or bad weather; their logistic support was somewhat shaky; and their superior headquarters did not understand or appreciate their situation. The Marine battalion commander who was told by his superior that he had no interest in how he deployed his companies must have puzzled over that even more than the reader will. But that battalion commander deployed his companies and got the job done.

The author has performed an outstanding job in reconstructing the details of the battle actions of U.S. units through extensive interviews of the people who fought the battle. Well portrayed is the superb training of the Marines, who quickly adapted to the tactics of fighting in an urban environment rather than the bush.

Actions of units of the U.S. 101st Airborne and 1st Cavalry Divisions in sealing off Hue from outside reinforcement and support are included in the book, as well as those of the 1st ARVN Division and the VNMC Battle Group Alpha, both of which fought valiantly with the Marines in retaking Hue. However, the U.S. Marine battalions provided the combat savvy, blood, and guts to accomplish the task of clearing Hue of the enemy. It has long been an axiom that battalions fight the battles, and this old concept is no better illustrated than in

the descriptions in this book of the Marines fighting in Hue.

If there is something missing from the book, it is the lack of more detail in the actions of the 1st ARVN Division in and around Hue during TET 1968. This division held most its positions in Hue from start to finish of TET 1968. It performed well in clearing Hue, and was reinforced by other GVN units, including the VNMC, during the fighting. More details of its actions would have added to the book.

Numerous examples of juniors stepping forward to assume the place of leaders who had fallen are contained in the book, particularly in the Marine units. This once again served to emphasize the excellent Marine training. There was one example of a company in which corporals commanded all three platoons.

This is a good book for junior leaders to read — to see some of the unexpected situations that may arise in combat, as well as the examples of what determined individual leadership can achieve under almost any condition.

LEO D. JOHNS  
COL, USA, Ret.  
Midlothian, Va.

**Go Tell the Spartans** by Jerry Pournelle and S.M. Sterling. Baen Books, Riverdale, N.Y., 1991. 345 pages (paperback), \$4.95.

Need a book to take to Graf? Take this one. Need a book for an officer professional development seminar on low-intensity conflict? Use this one.

Readers of science fiction are familiar with Messrs. Pournelle and Sterling. In this work, they both entertain and educate. The book is a fast read. The characters and situations are lively. The battle scenes will set your teeth on edge. This book is fun to read and tuck in your cargo pocket while you wait for the fog to lift on Range 117.

This book will also give you a great start point for a class or series of classes on low-intensity conflict (LIC). Pournelle and Sterling set one battalion against the dual challenge of training a native army while simultaneously fighting a growing insurgency. The training program covers weapons training and small unit exercises, to combined arms

exercises and leader training. The insurgency grows from Mao's phase one guerrilla and political terrorism stage to phase three conventional unit battles. Starting with this book, a unit OPD session can cover the gamut of LIC problems.

LIC looms large in many units' METL, conventional as well as SOF. This book offers a readable yet challenging exposure to the problems and challenges facing counterinsurgent units. The intelligence preparation of the battlefield is different, including urban and rural terrain as well as the political landscape. The law of land warfare comes into play as the savagery of the terrorist demands a response. Yet forces representing the established government must obey the law as the terrorist upsets the law while hiding behind it, setting up the "what do you do now, lieutenant?" question session. The vehicles the book provides also allows a user friendly framework for exploration into the world of guerrilla.

Pournelle and Sterling used classic Chairman Mao to set up the guerrilla force and campaign. Mao did say that guerrilla war in China was different than warfare in other settings, but most guerrilla forces use Mao as the bible for action, adapting him to their area of operations. The phases of guerrilla operations follow Mao's guidelines and give graphic examples of their products. Phase one guerrilla operations include hit and run operations on police forces and terror. Phase two, mobile warfare, blends small conventional units with continued guerrilla and terror operations. The final battle is classically phase three with large conventional forces clashing. The easily identifiable phases allow for reflection and discussion when used for OPD. The problem of the guerrilla will not go away, especially in the aftermath of DESERT STORM and our decisive conventional military victory.

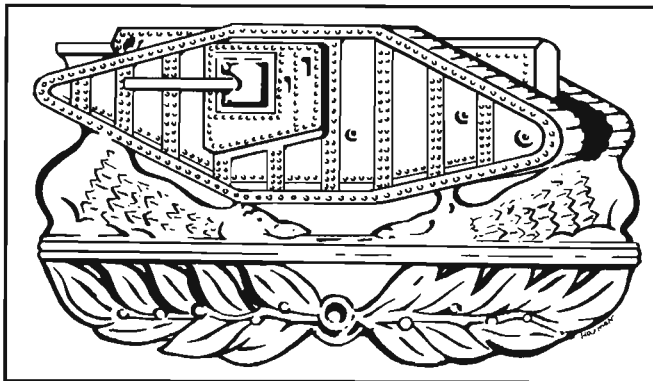
This book is fun to read, but after the fun it will make you think. Our enemies may not challenge us with large conventional force next time. The response to superior conventional force may be unconventional. Are you getting ready for the next war? Read this book and reflect on your answer.

KEVIN C.M. BENSON  
MAJ, Armor  
Ft. Leavenworth, Kan.

# Proposal for two Armor badges goes to Department of the Army

General Frederick M. Franks Jr., TRADOC commander, has recommended that the Chief of Staff of the Army approve a plan by the Chief of Armor to award Combat Armor and Expert Armor badges similar to the long-established Combat Infantryman's Badge and Expert Infantryman's Badge. If approved by the Chief of Staff, the badges will provide a way to recognize outstanding Armor soldiers, increasing the morale and esprit of the Armor Force.

## The Combat Armor Badge



The Combat Armor Badge would be an exact replica in size and color to the insignia approved in 1918 for what was then called the Tank Corps. The insignia was the second design authorized for wear and was in use between 1918 and 1920. George S. Patton Jr. and other officers of the Tank Corps wore it during the Battle of St. Mihiel, 12 September 1918, the initiation by fire for what is now called the Armor Force.

## Expert Armor Badge

The Expert Armor Badge is an exact copy of the Armor Branch insignia worn during World War II and until 1951, when the current branch insignia was authorized. The Mark IV/V tank was one of the first tanks successfully employed, at the Battle of Cambrai in 1917. The U.S. battalion of heavy tanks employed it at the Battle of Epehy during the Meuse-Argonne Campaign of WWI.

