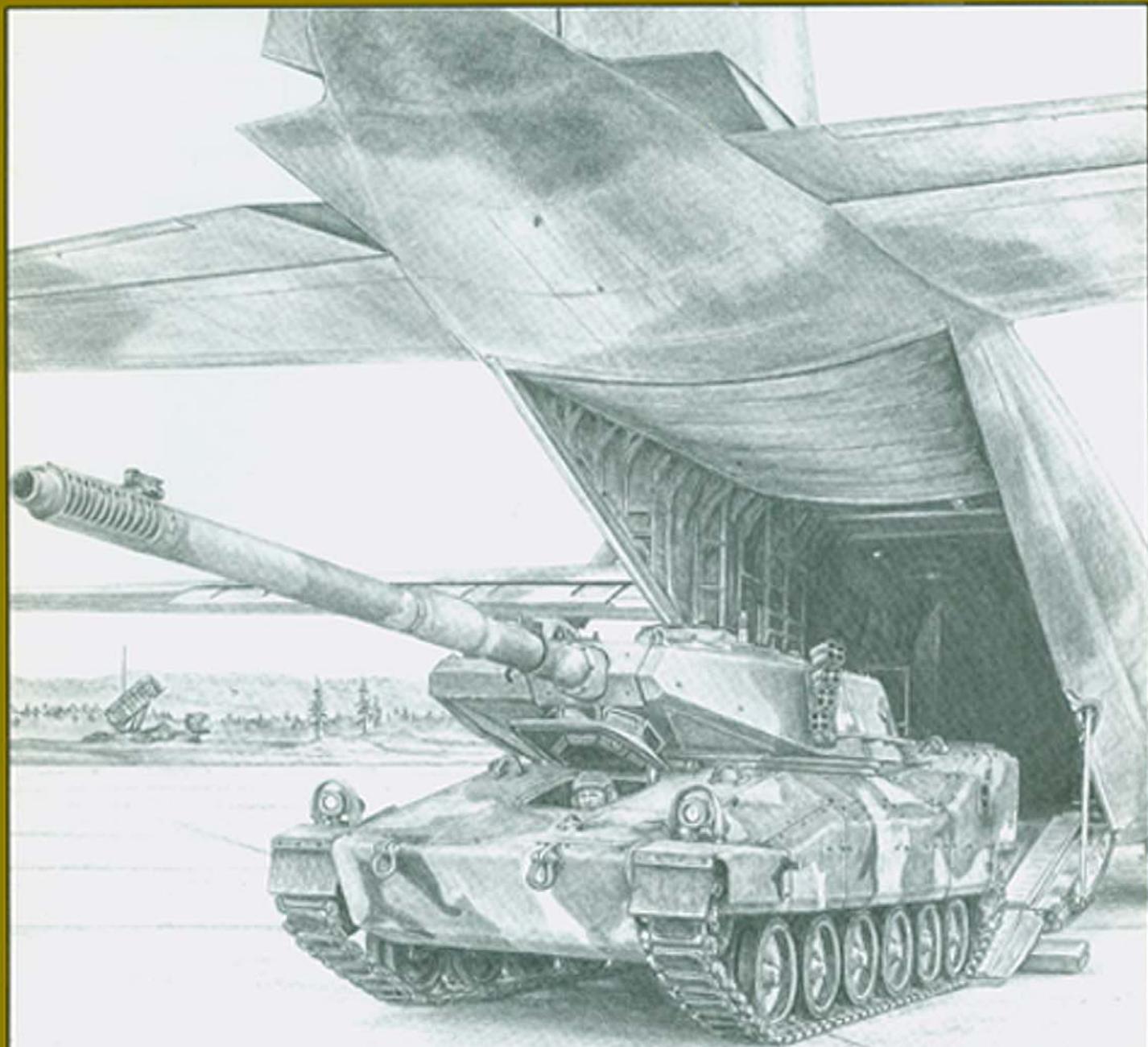


ARMOR



THE ARMORED GUN SYSTEM

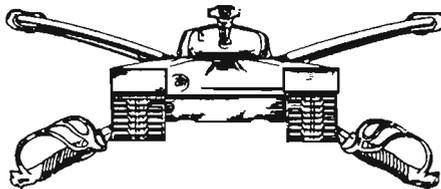
Deployable Firepower for Light Forces



First With The Most

Those of us who serve in the Armor Force know that no matter how far we may roam, or where we may find ourselves on duty, Fort Knox has a way of calling us back to these rolling hills. Whether we return as a seasoned master gunner, a new captain whose sewn-on rank hasn't yet faded, or as a soon-to-be battalion/squadron commander, we can't help but feel like we've come home as we drive along 31W and pass the Patton Museum. The Home of Armor has beckoned me to return as the 37th editor of *ARMOR*, and I look forward to working with you, the readers and contributors, to make it the best professional journal in the Armed Forces.

I began my career as a private in Disney Barracks in the mid-seventies, and, having served in maneuver units as everything from a scout to an S3, I believe I can bring a unique perspective to the literature of our profession. I come to this job with an open mind and a thirst for tightly written, insightful, and for-



ward-looking articles that stimulate discussion among warriors. My focus for the magazine will be simple: with historical articles, we will appreciate the past and savor the lessons from it — with articles about current training and leadership issues, we will monitor the pulse of the force — with articles projecting the future role of armor in a fast-changing world and a leaner force structure, we will be tactically preemptive and visionary.

To my predecessor, LTC Cooney, I wish the best of luck in his new assignment, and I thank him for leaving us with a well-respected journal. In his final issue, he offers us solid treatments of the cavalry squadron in the Persian Gulf and at the National Training Center, a look at British armor in *DESERT STORM*, an insightful account of a successful World War II tank commander, impressions of the Joint Readiness Training Center, and a thought-provoking discussion about commander's intent.

Good reading.

— J.D. Brewer

By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

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Milton H. Hamilton
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ARMOR

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LETTERS

Remembering Metz

Dear Sir:

I very much enjoyed reading the March/April issue of *ARMOR*. The articles are very informative about current armor happenings and help us "old-timers" keep abreast. I especially enjoyed the articles about the 7th and 8th ADs. I was a member of the 7th from the time that it was cadred from the 3rd AD until July 1945,

when I was transferred to the 1st AD for occupation duties.

On page 44 in the second paragraph, it states "It attacked to force a crossing of the Moselle... which had to be subsequently withdrawn." Not so!

The entire XXth Corps of the 3rd Army was across and attacking the fortifications at Metz. Military legend has it that the area had never been taken by storm since the Romans first fortified the area. It took the Third Army over two months of hard fight-

ing and a double envelopment to reduce the area.

During the battle, the tank/infantry teams would clear an area and then advance, only to receive enemy fire from the rear. How was this possible?

It was ultimately discovered that there were tunnels in the area and trap-door exits at various locations. These were well concealed. It took a long time to locate them, pry them open, pour in five gallons of gas and a grenade. This discouraged use of that one by the Germans!

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(The Armor Hotline is a 24-hour service to provide assistance with questions concerning doctrine, training, organizations, and equipment of the Armor Force.)

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The mobility of an armored division could not be used. The area had been the German Artillery School, and every terrain feature was zeroed in. The infantry losses were very high. The saddest sight that I saw in the war was when our 48 AIB withdrew. The half-tracks, which should have held 13 men, had six or seven men, some only two or three men. One track had only one man sitting there.

The 7th was sent to Holland as part of the 2nd British Army under General Dempsey as part of Montgomery's ill-fated drive to cross the lower Rhine. We defended the right flank against an intense German armored attack, and the Division was cited by the Dutch government for its efforts.

Keep the Guidons Flying!

ROBERT D. GRUEN
S4, CCA, 7th AD
COL, Armor, AUS, Ret.
Indianapolis, Ind.

Correction on MBD Turn In

Dear Sir:

It has come to our attention that an article in the September-October 1991 issue of *ARMOR* (The Muzzle Boresight Device, Where Have We Gone?), contained some erroneous information.

On page 40 of the issue, a note states, "Devices with serial numbers below 9000 should be turned in to be replaced with a modified device." This statement is in error.

The MBDs are to be modified, but not in sufficient quantity to provide a complete field exchange of present assets. A contract is pending to have the manufacturer modify existing supply stock (approximately 3,000 units) to provide an accuracy upgrade to (+/- 0.1 mil). The modified units will have an "M" stamped after the serial number to distinguish them from the present configuration.

The National Maintenance Point is not advocating an across-the-board exchange. We do not physically have enough assets to accomplish this or a large enough budget allotment to upgrade every MBD in the system. When the user's MBD requires replacement per normal condemnation procedures, and the current stock is modified, the user will most likely receive a modified boresight.

We hope this memorandum will help provide the current information on the MBD situation.

Should you have any questions or desire more information, please do not hesitate to contact us. The point of contact is Mr. Nick DeBolt, AMSMC-MAW-VK, DSN 793-1696.

R.D. HUSSON
Director of Maintenance
U.S. Army Armament, Munitions
and Chemical Command
Rock Island, Ill.

Additional SIMNET Facts

Dear Sir:

I just finished reading an article in the March-April 1992 issue of *ARMOR* titled, "Training With Technology: Armor 2000 and Beyond." In this article, Ms. Lou Edmondson described the present day and future training aids of armor.

The area which most caught my eye was on pages 18-19, subheaded "Virtual Reality: A Simulating Experience." In this section of her article, Ms. Edmondson describes the technology that will train the armor soldier beyond the year 2000.

I work at the SIMNET Warfighting Complex, Camp McCain, Miss. This site and two mobile sites are the only SIMNET sites dedicated to National Guard armor and infantry units.

I will not spend the rest of my letter dismantling Ms. Edmondson's article. However, I would like to add some facts about SIMNET that I feel she has omitted due to a lack of information.

SIMNET was originally a DARPA research contract. In short, DARPA asked the U.S. private technology sector, can a low cost, interactive, simulation network be developed to simulate battlefield situations in a peacetime environment? After years of development and work, Bolt, Beranek, and Newman and Perceptronics, contracted by DARPA, built the SIMNET sites at Knox, Stewart, Benning, Rucker, Camp McCain, M1 Mobile Idaho, and M2 Mobile MS and LA for CONUS operations, and Graf, Fulda, Schweinfurt, and Friedburg for OCONUS operations. These sites, less developmental sites at Ft. Knox and Ft. Rucker, were handed over to PM-Trade to be run under a CLS contract for the government. Basically, DARPA had shown that simulation is a viable tactical trainer for larger units, and they are now ready to make the next step (CCTT - Close Combat Tactical Trainers). The Army, in a quick move, said SIMNET is here now, it's already in place, let's use it for training while CCTT is being developed.

A SIMNET simulator was developed as an 80-percent simulation device. There is no night vision, no machine gun, no gas particulate filter system, etc. These items and others are not in the SIMNET scope of simulation. Many of these will be incorporated into future simulation devices that will eventually replace SIMNET. But, let's look at this realistically — it will be some time before this takes place.

A SIMNET simulator costs a fraction of what the actual vehicle costs. A company/team-size warfighting complex costs less to build, and certainly less to maintain, than a company/team of Abrams and Bradleys along with the ammo and fuel needed for an FTX. You have the ability to plan your training from an elaborate task force exercise at Ft. Knox to a very simple crew drill at Camp McCain. Also, there is the ability to modify your training plans to best use the situation at hand.

The National Guard units that frequent our site often use a modified tank table format to prepare for Tank Table VIII ranges. Movement, defensive drills, and offensive drills are very common and very high stress for crews. You need only stand by a simulator during a contact mission to hear how realistic it is to the crews.

Ms. Edmondson shows some shortfalls of SIMNET in reaching what she terms "virtual reality" (i.e., dynamic databases and two dimension). These items could be simulated, but I believe the cost of such a complex system would quickly outweigh the small amount of training realism.

It has been my experience in the past that few user units entering the doors of the warfighting complex can reach the full training potential of the simulators that we have now. I believe that we are trying to bring in the cart before the horse in this aspect. We as commanders, first-line supervisors, and trainers need to develop more realistic in-depth training on the systems at our disposal now, making the training environment more interesting to the trainee who will in turn learn more and become a better asset to his crew and unit.

I am always open to new and better technology, but I am also a believer in using your resources to the best of your ability. I am afraid it will be a star date quite a ways into our future before a HOLODECK will be operational at Camp McCain. Until then, SIMNET is a very suitable trainer.

CLARK HARTNESS
Electronics Technician
SIMNET MCCAIN
Elliott, Miss.

COMMANDER'S MATCH



MG Paul E. Funk, 34th Chief of Armor

It is an honor for me to return to Fort Knox, as the 34th Chief of Armor, particularly at a time when the challenges appear clear, and the future seems bright.

Since I last left the Home of Armor in 1987, our Army has deployed overseas twice — Operation JUST CAUSE in 1989, and Operation DESERT SHIELD/STORM in 1990-1991, neither of which many foresaw in 1987.

I don't have to tell you that the world is more unstable now than at any time in the last 45 years, and we don't know when or where we'll be needed next. What we do know is that we must be ready next week, tomorrow, now. Our warfighting capabilities must be honed to a sharp edge, and our leaders and trainers must be alert to new opportunities to train and maintain despite reductions in resources.

The Army is shrinking and reorganizing. Such a process requires tough leadership at all unit levels, imaginative solutions to problems, com-

araderie, and faith in the value of individuals and unit cohesion. The Army is beginning a new era, of that there is no doubt. Yet, for us who practice mounted maneuver warfare, these times are merely a continuation of what we've been doing all along. What won the Gulf War on the ground was heavy force soldiers learning from our armored brethren of the past and doing what we've trained for over the last 15 years. Good equipment is important. I assure you we'll continue to work on those issues. But the people — soldiers, civil-

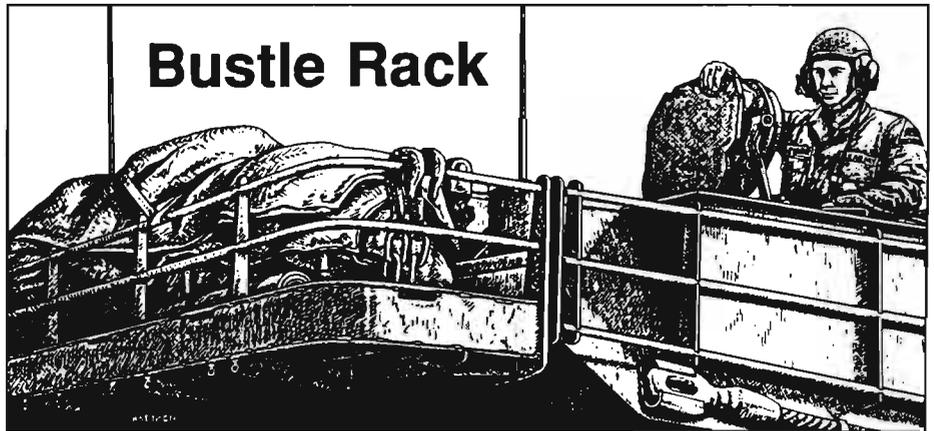
ians, and our marvelous families — are the rock on which we build. Our soldiers proved that they are highly trained, smart, and tough. You and I must keep them that way. With soldiers like these, how can we lose?

. As with everything we take the challenge to do, this Armor Force belongs to each one of us. Everyone has a personal stake in the outcome — what the team accomplishes. I want your ideas. The only stupid idea is one you keep to yourself.

It is a privilege for me to have this opportunity.

A native of Roundup, Montana, MG Paul E. Funk was commissioned from Montana State University ROTC in 1961. Among his key assignments were as XO and commander, Troop A, 1st Squadron (Airmobile), 9th Cavalry, 1st Cavalry Division (Airmobile), in Vietnam; commander, 5th Battalion, 33d Armor, 194th Armored Brigade; G-3 and chief of staff, 1st Cavalry Division; commander, 194th Armored Brigade; assistant commander at the Armor Center; ADC, 9th Infantry Division; and CG, National Training Center, Ft. Irwin. MG Funk commanded the 3d Armored Division in VII Corps, USAREUR, and in SWA; and most recently served as vice director, J3, the Joint Staff. Among his awards and decorations are the Distinguished Service Medal, Distinguished Flying Cross, Legion of Merit (w/OLC), and Bronze Star (w/OLC).

Tobyhanna Army Depot Working To End Fratricide



Tobyhanna Army Depot personnel have designed a device that could save soldiers' lives by identifying friendly vehicles in the confusion of a battlefield.

As a result of Operation DESERT STORM (ODS), it is now common knowledge that the problem of friendly fire, or fratricide, has come about as a result of current targeting and weapon systems technology. Such technology allows soldiers to detect and engage potential targets at ranges farther than it is possible to tell friend from foe.

Thirty-five Americans were reported killed by fratricide during ODS, and another 72 were wounded.

The potential solutions to fratricide involve research and development in four separate categories. These include quick-fix solutions that can be developed, produced, and fielded to the soldier in less than 18 months.

Next are near-term projects that can reasonably be expected to be fielded within approximately three years. Mid-term solutions are targeted for fielding within seven years, and long-term solutions more than seven years.

One of the first quick-fix solutions to have demonstrated considerable potential to reduce fratricide on tracked and combat vehicles is a Thermal Identification Device (TID) being developed by Tobyhanna Army Depot.

According to Jay Ceriani, a depot electronics engineer, the device works by rotating a hot plate made of four elements painted flat black and heated to 150 degrees F., and a cold plate of plastic or fiberglass impregnated or bonded with thermal reflecting material. This material, plus the flat black elements, are made to prevent reflected sunlight from giving away the position of the vehicle.

The rotating plates are hinged. When they are not rotating, they hang by the sides of the mast to lower the chance of sunlight reflection. When the plates are

spinning, they are raised by centrifugal force to their operating position.

Three laser detectors will also be added to the mast section of each TID. The masts will be different heights depending on what vehicle they are used on. The masts will be collapsible at the base.

"The TID is designed to be seen through thermal equipment," John Gresham, Deputy Project Manager for Night Vision and Electro Optics at Fort Belvoir, Va., said, "making it possible to identify a friendly vehicle day and night through fog, dust, smoke, rain or any other obscuring."

When viewed through thermal equipment, the spinning plates resemble a strobe, thus identifying a potential target vehicle as friendly.

At this time, the TID is destined for the M1 tank, the Bradley Fighting Vehicle, and the Sheridan, but may have potential use on all tactical vehicles as well.

Work is also being done on a back-up system in case the TID is damaged or even shot off.

"While we presently don't have a back-up system," Joe Salamido, a depot electronics engineer, said, "work is being done to develop protective redundancies along with some kind of radio signaling device to activate the TID."

"Tobyhanna will make it as rugged as possible so the vehicle can go through tree branches and bushes," Gresham said. "But if it's shot off, then it's taken out. What it takes to shoot it off depends on how rugged the Tobyhanna design is."

One protective redundancy already included are the four heater elements. They work independently of each other so if one is damaged, the other three can still operate.

Tobyhanna was chosen for this project over other sources because of its engineering resources, its ability to build from scratch both the electronic and metal parts, and because of its customer orientation and quick turnaround.

A permanent solution to fratricide is being worked on by Army Materiel Command's Laboratory Command in conjunction with the Defense Advanced Research Projects Agency and other Department of Defense (DoD) agencies.

"They are looking at literally dozens of potential solutions to address fratricide," Gresham said.

Tobyhanna is the Army's largest facility for the repair, overhaul, and fabrication of communications-electronics systems and components. Depot personnel are responsible for hundreds of these systems, ranging from tactical field radios to the ground terminals for the entire DoD communications network. Approximately 4,000 people work at the installation, which is located in the Pocono Mountains of northeastern Pennsylvania.

Officer Seeks Anecdotes on Combat Impact of Refugees

LTC Douglas L. Erwin, professor of political science at the Air Force Academy, is gathering information on the impact of refugees in combat situations during WWII and the Korean War. He is specifically interested in how and whether the presence of refugees in a combat zone affected U.S. operations or plans, slowed the progress of troops, prevented maneuver, or forced other compensations. He is not interested in the effect of refugees after they have passed U.S. lines, but only in their effect on combat.

He's seeking notes and details, not polished written accounts, and would welcome replies from soldiers at all levels, from infantrymen and tank commanders to higher-ranking planners and combat leaders. He plans to publish significant case histories as a guide to future operations.

He can be reached by mail at the Department of Political Science, USAFA, Colorado 80840, or at 719-472-2388 or 2270.

Tanks in the Division Cavalry Squadron

The commander of a division cavalry squadron argues the necessity of tanks, based on experiences during the Gulf War



Offloaded M1A1s await issue at the port of Jubail, Saudi Arabia.

by Lieutenant Colonel Robert Wilson

First Squadron, 4th U.S. Cavalry (Quarterhorse), 1st Infantry Division (Mech) was alerted to deploy to SWA on November 8, 1990. The squadron's combat elements consisted of Bravo Troop (19 Bradleys, three mortars) and Charlie and Delta Troop (six OH-58s, four AH-1s each). On 9 November, the formation of the second ground troop (Alpha Troop) was approved. On 22 November, we learned that the squadron would receive 40 M3A2 Bradleys and nine M1A1 tanks upon our arrival in SWA. Integrating the tanks and the second ground troop into the squadron's organization were key to our success in combat. Getting them was not easy, and keeping the tanks after the war was not possible. The following is a brief account of how we built the organization and its effectiveness in combat.

Background

In the fall of 1990, MG Thomas G. Rhame, commander, 1st Infantry Division (Mech), wrestled with the problem of where 1st Squadron, 4th Cavalry would get its second ground troop. Would it come from the draw-down of either the 1st Infantry Division (Forward) or 2d Armored Divi-

sion (Fort Hood), or would he requisition it? On November 8, 1990, when the division was alerted for deployment to SWA, he made his decision; he would requisition it. The plan was to pick up as much equipment as possible in CONUS and draw the remainder of the equipment in Saudi Arabia. Alpha Troop received three M106 mortars and one M577 at Fort Riley, Kansas, on 21 November.

On 22 November, I received a telephone call from the G3, Lieutenant Colonel Terry Bullington: "Bob, the division is going to draw 249 M1A1 tanks in SWA. This is nine more than we were expecting, and I am wondering if nine tanks might be directed to the squadron. Does this track with anything Fort Knox has been working on?" I informed him that, at the direction of commander, FORSCOM, Fort Knox had been working on a couple of options to test tanks in the division cavalry; one of those options included nine tanks per cavalry troop. The test was to occur in USAREUR and FORSCOM. I told Terry that I would get the specifics from Fort Knox and ask them to express mail the information to him.

We called the Documentation Branch at the Directorate of Combat

Developments, Fort Knox, and asked for assistance. It mailed the test MTOE to the squadron and the division. After review of the MTOE, the division informed force development, FORSCOM, of its requirement for 249 tanks. This included division floats and nine tanks for the cavalry squadron. We planned to organize the tanks into three 3-tank sections and integrated them into three of the squadron's scout platoons. There were no excess tankers in the division, so we requisitioned 36 19Ks. Because of the short predeployment training period, we elected to assign sergeants first class instead of second lieutenants as tank section leaders. I called Colonel J.W. Thurman, Director of the Command and Staff Department at Fort Knox, and asked him for training assistance. Could he send a cadre to Fort Riley within the next three weeks to teach an accelerated Scout Platoon Leaders Course to a newly organized ground cavalry troop and tankers? He was very receptive and, thanks to a break in the SPLC schedule during the Christmas holidays, the training occurred in December. We manifested Alpha Troop and the tankers on the last airplane in order to take advantage of this golden training op-

portunity. The training was superb, and instilled confidence in both the scouts and the tankers.

The Preparation

The squadron deployed to SWA in two groups; HHT and B Troop on 30 December, and A, C, D, and E Troops on 10 January. On 5 January, at the port of Dammam, Bravo Troop received 20 M3A2 Bradleys (one for the troop XO) and six M1A1 tanks. Since Bravo Troop was the more mature troop, with an experienced commander (Captain Mike Bills) and at approximately full strength, we assigned it six of the nine M1A1 tanks. Three each were integrated into two scout platoons (see Figures 1 and 2).

Alpha Troop, commanded by Captain Ken Pope, deployed on 10 January with 97 of 140 authorized personnel. Thirty-six additional personnel (19D, 19K, 11M) joined the troop at the port of Dammam. On 13 January, Alpha Troop received 20 M3A2 Bradleys and three M1A1 tanks. The organizational charts show how Alpha Troop organized for combat. Due to the lack of NCOs, four Bradleys were kept in the HQ recon/security platoon, located in the squadron combat trains. Several Alpha Troop scouts were not qualified on the Bradley, and many of the tankers had not been trained on the M1A1 tank. Colonel Dave Bird, Chief, Armor Systems Modernization, ARCENT, and Lieutenant Colonel Dale Ross, Force Development, HQDA, DCSOPS, bent over backward in the fielding and training of our soldiers on their new equipment. Commanders of 3-37 AR and 4-37 AR cross leveled a few of their more experienced tank gunners for some of our privates. Colonel James L. Mowery, commander, 4th Brigade; BG J.R. Rutherford, ADC(S); and BG William G. Carter III, ADC(M) were instrumental in acquiring critical equipment to fill shortages. On 14 January, we deployed Bravo Troop, and on 21 January, we deployed Alpha Troop to tactical assembly area Roosevelt.

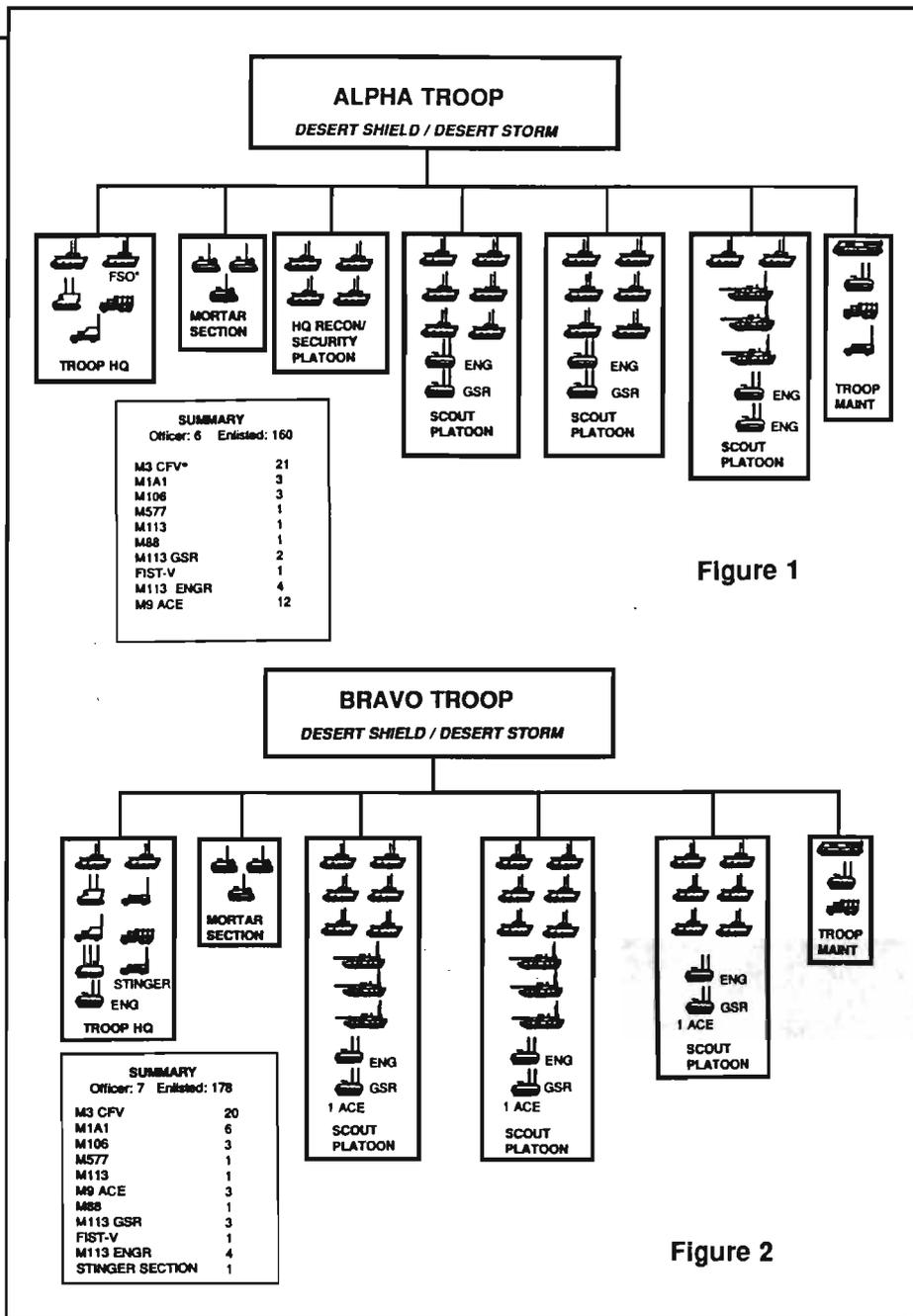


Figure 1

Figure 2

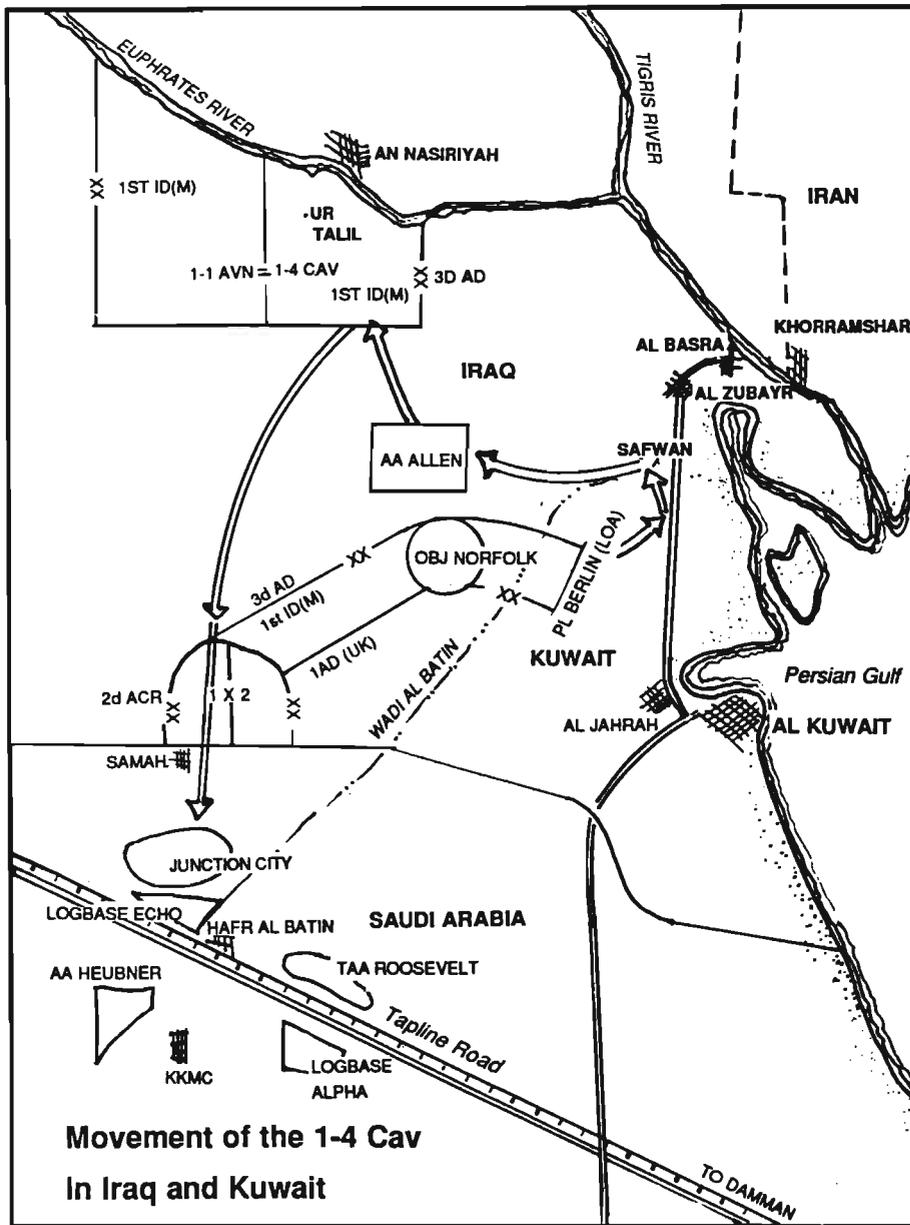
Soon after our arrival, we had the opportunity to fire all of our weapon systems at Jayhawk range. On 24 January, Alpha Troop received the last of its critical equipment (M60 MGs, GVS-5s, CVCs, flak vests).

MG Rhame had told me from the very beginning that he would not commit Alpha Troop to combat until I informed him that it was trained and ready to survive the rigors of war. We both agreed that soldiers lives would not be risked because of haste. The division had made contingency plans

to employ Alpha Troop in the division rear. Would there be time?

Security of Logbase Echo

VII Corps and 1st Infantry Division were prepositioning CSS assets to forward assembly area (Junction City), vicinity of Logbase ECHO, some 127 kilometers to the northwest of TAA Roosevelt. MG Rhame ordered the cavalry squadron commander to provide the logbase security for the VII Corps and division assets. Bravo



**Movement of the 1-4 Cav
In Iraq and Kuwait**

Troop, with attached GSR and ADA, deployed to Junction City on 24 January and assumed a stationary screen. On 25 January, we deployed the air troops and placed the squadron(-) under the command of the squadron S3, Major John Burdan. On 27 January, the squadron's remaining element, Alpha Troop, arrived at FAA Junction City. Due to the distance from division, FM communications were sporadic. Topographical maps were incomplete, with only selected map sheets available for planning. We added blank sheets of paper to our operations maps and drew NS-EW grid lines for reference. This was adequate, considering the lack of terrain features in the area. The CG filled Alpha Troop's 19D shortages by sending the

squadron 25 infantrymen (11M). On 28 January, the squadron's screen was extended east to the 1st Cavalry Division's boundary. The 45 kilometers sector required that the eastern 15 kilometers be covered by air cavalry. Bravo Troop was tasked to link up twice daily (usually by air) with 1-7 Cavalry, 1st Cavalry Division's westernmost element.

In the early morning of 1 February, 52 Saudi border guards entered our sector from the north. They had been attacked the night prior, in the town of Markaz Samah Al Jadid, by an Iraqi ground force. After processing them through intelligence channels, we escorted them out of our sector.

At 0630 hours, a Bravo Troop GSR detected four enemy dismounts mov-

ing toward its observation post. A nearby ground scout section, overwatched by tanks, moved forward and visually acquired the enemy patrol. After firing a burst of coax on each side of the patrol, the Iraqis displayed a white flag and surrendered. A search of the immediate area found hand grenades buried in the sand.

On 2 February, an air troop scout weapons team destroyed an Iraqi engineer vehicle, a radar tower, and two buildings just north of the berm.

Combat Command Carter

The CG increased the size of the security force on 3 February by moving 3-37 AR and 1-5 FA to AA Junction City. He placed these assets and the "Quarterhorse" under the command of BG William G. Carter III, ADC(M) and designated the forward combat element "Combat Command Carter." On 4 February, a Delta Troop scout weapons team (SWT) destroyed an AML reconnaissance vehicle north of the berm with a TOW missile.

After receiving numerous reports of enemy activity in the town of Markaz Samah Al Jadid, the squadron planned a raid on the town. On 6 February, a heavy SWT (two OH-58s and two AH-1s) reconnoitered the town by fire. After firing 20-mm cannon and 2.75-in. rockets into the town, an Iraqi soldier rushed out of a building displaying a white flag. I directed a Bravo Troop Bradley section to move to the building, secure the prisoner, and conduct a thorough search of the facility. Bravo Troop tanks remained in overwatch as the Bradley section moved forward. The scout section evacuated the prisoner and several pieces of communications equipment to the squadron rear. During the period 8-10 February, RPVs overflew our positions. Hypothesizing that recently observed building antennas were controlling the RPVs, BG Carter authorized the AH-1 Cobras and AH-64 Apaches to take them out. All known antennas along the border were destroyed. On 11 February,



More than 2,000 prisoners of war taken near the Kuwait City-Basra highway.

Bravo Troop captured an additional seven EPWs.

On 13 February, the "Quarterhorse" became OPCON to the 3d Brigade, 2AD forward (TF IRON). From 27 January to 13 February, Alpha Troop matured into a magnificent armored cavalry troop. On 14 February, I informed the brigade commander and the division commander that Alpha Troop was ready for combat.

Task Force Iron

On 15 February, the squadron, as part of TF Iron, cut ten 20-meter holes in the border berm and pushed north several kilometers into Iraq. We used the Cobras and Bradleys in overwatch, while the tanks punched through the gaps created by the ACEs. Contact was relatively light; the squadron destroyed a communications outpost and a sand fort, and captured the first Iraqi flag. These cuts in the border berm, along with others cut by 1-41 (Mech) Infantry, would provide the lanes for the division's attack on the 24th. The tankers embraced cavalry from the very beginning. They had confidence in themselves, their equipment, and their leaders. The tanks enabled the squadron to increase its reconnaissance momentum, operate with more independence, and provide a greater degree of security for the division.

The Breach

G-day, February 24, 1990. The division's mission was to attack as VII Corps main effort to penetrate Iraqi defensive positions, defeat the enemy first tactical echelon, and con-

duct the forward passage of VII (US) Corps' forces; on order, continue the attack in zone to destroy the RGFC. The "Quarterhorse" was OPCON to 1st Brigade, commanded by Colonel Lon E. Maggart, for the initial phase of the operation. Our mission was to follow 1-34 AR through the breach of the enemy's trench lines and secure Objective 15K. The squadron, thereby, would protect the division's northern flank from a counterattack. Intelligence had reported an enemy tank company in the vicinity of our objective. We again led with our tanks, destroying three antitank guns, two AMLs, four trucks, and numerous bunkers, and captured 145 prisoners of war. The tanks were indispensable in accomplishing this mission. On 25 February, we extended our screen line northwest, and the division began passing the 1st UK Division.

On the 26th, the CG ordered the squadron east to conduct a zone reconnaissance and establish contact with the 2d ACR. Unfortunately, adverse weather precluded our use of the air troops. We led with Bradleys, tanks providing overwatch, and destroyed one T-62 and one ZSU 23-4. After we made contact with the 2d ACR, the CG instructed us to coordinate for the division's night passage of lines.

Securing the Division's Flank

Four hours after the passage had begun, (270130 Feb) the squadron, under division control, moved to screen the division's northern flank along the 1st Infantry Division/3d Armored Division boundary.

In the process of inspecting the screen line, the command group encountered three tanks and dismounted infantry. We could observe the dismounted infantryman and the tanks through our thermals. They could hear us, but could not see us. After getting assistance from a Bravo Troop tank, we maneuvered to their right flank and destroyed all three tanks. Their dismounted infantry went to ground. During a sweep of the area, Bravo Troop acquired and destroyed an additional five tanks. All enemy tank engagements were at 150-500 meters. We apparently had discovered an enemy pocket between the two divisions. The ground troops attacked 10 kilometers from west to east in order to clear the area of any remaining enemy. We attacked with two ground troops abreast, leading with tanks, destroying 11 tanks, three artillery pieces, and a platoon of dismounted infantry. Additionally, we took hundreds of EPWs. The enemy position turned out to be an Iraqi log base, secured by a tank company (+), a mech infantry company, and an artillery battery. The Bradley's 25-mm cannon penetrated T-55 tanks and portions of T-72s. The TOW penetrated whatever it touched, often blowing off tank turrets. The M1A1 tank's 120-mm gun destroyed T-72 tanks in rapid succession.

Blocking the RGFC Retreat

At 0930, 27 February, the division resumed its movement NE towards Objective Norfolk. The ground troops moved with the Bradleys, providing the flank orientation and the tanks in depth, acting as a reaction force. The



An Iraqi tank maneuvers under the sights of a 1-4 CAV Bradley at Safwan "stand-off".

air troops provided aerial reconnaissance forward and to the flank of the ground troops. The squadron destroyed 26 tanks and 25 PCs (many which were abandoned) and captured 193 prisoners during the movement. The division secured Objective Norfolk at 1230 hours.

The CG ordered the attack to resume at 1430. The division commander's intent was to prevent the Iraqi Army's escape from Kuwait to Iraq. He would accomplish this by assigning squadron and brigade objectives astride the Kuwait City/Basra highway. The squadron's mission remained unchanged — screen the division's northern flank. The squadron's objective was astride the Kuwait City/Basra highway in the extreme north, 12 kilometers from the Iraqi border. As we approached the highway (1630 hours), we observed several armored vehicles moving north along the highway toward the Iraqi border. Alpha Troop destroyed the lead T-55 tank and BMP, temporarily blocking the road. We attempted to send a situation report to the division commander, but could not reach him nor the DTAC.

We called the nearest brigade (2d Brigade) but again could not establish communications. Knowing the division commander's intent, I ordered the squadron to attack. Alpha Troop was ordered to block the road, establish a screen three kilometers to the east of the highway, and destroy enemy movement north. I gave Bravo Troop an identical mission, but to the west of the road. Alpha and Bravo Troops destroyed several Iraqi armored vehicles as they attempted to

move north. The burning oil fields darkened the sky, silhouetting the exploding vehicles. Prisoners were moving across country in mass. We had taken more than 450 EPWs by 1830. Because of darkness, and fearing a counterattack from either direction, I ordered the ground troops to collapse their screen lines and set up defensive positions with all-around security. What was initially armed reconnaissance and a screen turned into a hasty attack and a night defense. The squadron's tanks made this possible. I set my command post on the road next to the EPW site and established contact with 2d Brigade. We learned some very discouraging news from Colonel Moreno, commander, 2d Brigade — the attack had halted 30 kilometers east of PL Berlin — and there were no division combat elements within 25 kilometers of our position. I explained our situation and asked for assistance. Could 2d Brigade send us a tank company, a mech infantry company, and some artillery support? Colonel Moreno said he would do everything humanly possible, but needed the CG's approval. Within minutes, he called back and informed us that no movement was authorized in zone. By that time, we had taken more than 1,000 prisoners and stockpiled more than 700 weapons. The mass of prisoners was siphoning off our combat strength, so we instructed the squadron combat trains, with aid station, to move to the EPW collection point and take over the guarding and treatment of the prisoners. With the assistance of Kuwaiti doctors, we treated more than 350 casualties. Twenty-five pris-

oners were seriously wounded, 19 of which required air evacuation the next morning. The squadron chaplain and UMT also operated out of the EPW collection point. Secondary explosions and enemy activity kept us alert all night. By morning, the squadron had taken 2,098 prisoners and stockpiled more than 1,400 weapons. We did not have adequate food, water, or blankets to care for the prisoners, and had a near riot when someone threw a handful of MREs into the crowd. Only the firing of machine guns over the heads of the prisoners quieted the situation. The division resumed its movement east in the early hours of 28 February and secured its objectives along the Kuwait City/ Basra highway. The cease fire went into effect at 0723 hours. Additional prisoners were directed toward the squadron from an Apache team working in the division area. Second Brigade sent us an infantry company to assist in guarding the EPWs. ACEs from the 1st Engineer Battalion arrived to build a berm around the prisoners in order to ease our security requirements. The prisoners raised quite a ruckus when they saw the ACEs. They actually believed that we were going to bury them. We spent the remainder of the day clearing the highway of debris and burying enemy KIAs. The tanks were indispensable in this operation, not only for their killing power but as a deterrent to a would-be attacker against an isolated force.

Securing Safwan

On 1 March at 0240 hours, I received an urgent query from the CG: "How long until you can move your squadron north 15 kilometers into Iraq and secure Safwan airfield?" I told him we could move one ground troop in 20 minutes and the squadron in 45 minutes. He told me to prepare to move ASAP and call him PCM. After transferring to PCM communications, I learned that Safwan airfield was the selected site for the coalition peace talks and it was thought to have been

in U.S. hands prior to the cease fire. The CG told me that the enemy situation was unclear, and placed an Apache company OPCON to the squadron. He instructed us to move as a squadron and secure the airfield, if possible, without breaking the cease fire agreement. I issued an oral FRAGO, mounted up, and prepared the squadron for movement. We were then informed to delay our LD until 0615 hours. We elected to bypass the town of Safwan and the border check point to the west in order to avoid attention. We moved directly to the airfield. The squadron moved with an air screen forward followed by two ground troops abreast with tanks. The Apache company moved to a location in the vicinity of the squadron TOC and remained on standby. Enroute to the airfield, we passed through an enormous number of vacated enemy positions. The aeroscouts then reported many tanks, MTLBs, AMXs, and ZSU-23-4s in prepared positions north of the airstrip. The command group moved to the location of several Iraqi armored vehicles and personnel, dismounted, and confronted a group of Iraqis. It was obvious from their pressed uniforms, discipline, and equipment that they were a Republican Guards unit. They asked "What are you doing in Iraq?" We informed them that 1st Infantry Division was moving into the area, that this would be the peace negotiation site, and that they would have to move five miles north by noon today or that the 1st Infantry Division would attack. The Iraqi colonel became upset and told us that he would talk to his general. He then repositioned four T-72 tanks within 50 meters of our position. We repositioned to the rear about 300 meters to ease the tension. The ground troop commanders also confronted Iraqi commanders and received similar responses. I instructed the ground troop commanders to reposition their tanks forward and show more combat power. We also had the Cobras overfly the Iraqi positions. I received an FM call from the ADC(M) to meet

him on the runway for a conference. We learned that the CG was moving 2d Brigade to our east to secure the town and that we should continue to press the Iraqis to evacuate the area. We also learned that the peace talks may be delayed until 3 March. The commander, 4th Brigade landed his helicopter, confronted the Iraqi colonel again, and told him that if they did not leave the area they would be destroyed by nightfall. At 1100 hours, the Iraqi armored brigade, Hammurabi Division, Republican Guards, began moving out of the area. We counted more than 200 armored vehicles moving north along the road to Basra. The squadron became OPCON to 2d Brigade and remained at Safwan to assist in securing and preparing the area for the coalition peace talks. Without tanks in the squadron, the division commander may not have felt comfortable sending the division cavalry on such an important mission with so little enemy intelligence. The squadron tanks gave us greater confidence in our ability to accomplish the mission and deal with the uncertainties of war.

Relief of the 2ACR

On 19 March, as part of 4th Brigade, we moved 100 kilometers west to a division assembly area (AA Allen). On 6 April, the 4th Brigade moved 90 kilometers NW to relieve the 2d ACR along the Euphrates River. The rest of the division remained in the south. We manned three checkpoints along the demarcation line and processed several thousand refugees and EPWs. Additionally, we provided medical treatment to several hundred Iraqi men, women, and children. The tanks were placed at each checkpoint and were absolutely essential to this operation.

On April 15, 1991, we started our movement south (220 kilometers) to rear assembly area Huebner, to prepare for redeployment. We were directed to turn in our tanks at Huebner

and our M3A2 Bradleys at the port of Damman.

Conclusion

The second ground troop and tanks were critical to the squadron's success during Operation DESERT STORM. Activating the second ground troop shortly before the war was difficult, but absolutely essential in providing the division commander with a credible reconnaissance and security capability. The air/ground cavalry mix was very effective, and enabled the squadron to move rapidly and cover a large area of operations. The squadron's tanks were used in all cavalry missions. Having them organic to the squadron and integrated into the scout platoons was clearly an advantage. Operating as a cavalry team, they easily responded to "actions on contact." Additionally, having the tanks in the squadron gave the division commander more options and greater flexibility in employing his division cavalry.

Several Army studies recommend that tanks should be organic to the division cavalry squadron. Many division commanders routinely attach or OPCON one or more tank companies to their cavalry. Should we not organize our squadrons in peacetime like we will employ them in war time? I think the answer is YES!

Lieutenant Colonel Bob Wilson has served in a variety of command and staff assignments in 2d Armored Division, 25th Infantry Division, and 1st Armored Division. He was Chief, Cavalry Branch, Fort Knox, Kentucky and, during DESERT STORM, was Commander of 1st Squadron, 4th U.S. Cavalry, 1st Infantry Division (Mech), Fort Riley, Kansas. He is currently the G3, 1st Infantry Division (Mech).



British Challengers proved themselves — one crew claimed a 5100-meter hit on an Iraqi tank.

British Armor in Desert Storm

by Lieutenant Colonel David Eshel, IDF, Retired

As more information becomes available on the performance of DESERT STORM participants, it is interesting to focus on the part played by British tankers who fought with VII Corps in the 100-hour ground war. The following account describes the actions of the 1st British Armored Division — and especially 4th Armored Brigade — in what the British call DESERT SABRE.

The initial British contribution to the DESERT SHIELD deployment was 7th Armored Brigade, commanded by Brigadier Patrick Cordingly. Arriving in Saudi Arabia during October 1990, the modern “Desert Rats” continued the traditions of their forebears, who earned their nickname battling the Axis in North Africa during WWII. The brigade deployed two armored regiments (tank battalions) — the Queens Royal Irish Hussars and the Royal Scots Guards, each equipped with 57 Challenger 1 main battle tanks. The third formation in the brigade was an armored infantry battalion, 1st Battalion the Staffordshire

Regiment, with 45 Warrior IFVs. The Warriors had only recently been fielded.

The brigade traveled directly from its home base in Soltau/Fallingbommel, in Northern Germany, while heavy equipment was shipped by sea. To enhance its combat capability, the brigade received a squadron (company) of Scimitar light armored reconnaissance vehicles from the Queen’s Dragoon Guards, an armored engineer regiment, and the 40th Field Regiment Royal Artillery, with 24 M109 self-propelled 155-mm howitzers.

Seventh Armored Brigade was the first formation equipped with 120-mm tank guns to arrive in Saudi Arabia. American armor deployed up until that point included only 105-mm-gun-equipped M1 or M60 tanks. After arrival, the 7th came under the command of the U.S. Marines to bolster their armored firepower against possible encounters with the Iraqi T-72 tanks that faced the coalition forces along the Kuwaiti border.

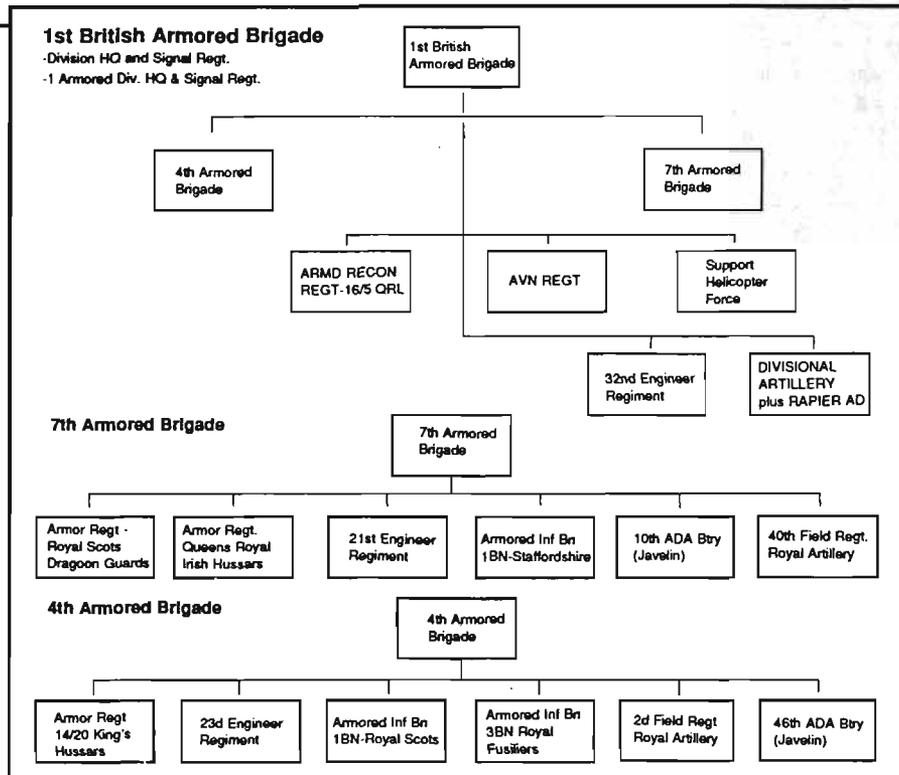
As the ground offensive plan for DESERT STORM started shaping up, it became clear that the coalition would need more heavy forces, including sufficient logistical support for the fighting teeth. The result was a substantial increase in armored forces. Heavier 120-mm M1A1s arrived from Germany with the U.S. VII Corps. From British forces in Germany came the 4th British Armored Brigade and the headquarters of 1st British Armored Division, with its divisional troops.

Fourth Armored Brigade, commanded by Brigadier Christopher Hammerbeck, included one armored regiment, the 14/20 King’s Hussars, augmented with one squadron from the Life Guards, with 59 Challenger 1 MBTs, and two armored infantry battalions, 1st Battalion Royal Scots and 3rd Battalion the Regiment of Fusiliers, the latter supplemented by a company from the Grenadier Guards. In support was a field regiment of the Royal Artillery and a combat engineer regiment. In contrast to 7th Armored

Brigade, Hammerbeck's brigade was a totally ad-hoc formation. Only the headquarters, the armored regiment, and one artillery battery originally belonged to the brigade in Germany. The two armored infantry battalions were newcomers, chosen because they were equipped with Warrior IFVs. While still in Germany, the brigade went into a hasty training schedule aimed at bringing the various battalions up to combat shape. After deployment to the Gulf, it underwent further training, especially live firing on open desert ranges.

By January 30th, the brigade became operational, ready for action. By that time, the two armored brigades had already come under the command of Major General Rupert Smith, commanding general of 1st (UK) Armored Division, which itself was becoming part of U.S. VII Corps. There is no need here to go into the planning stages of the VII Corps battle plan, which has been adequately covered elsewhere, but we shall concentrate on the part played by 1st (UK) Armored Division and emphasize the battle fought by 4th British Armored Brigade, about which we have more precise details.

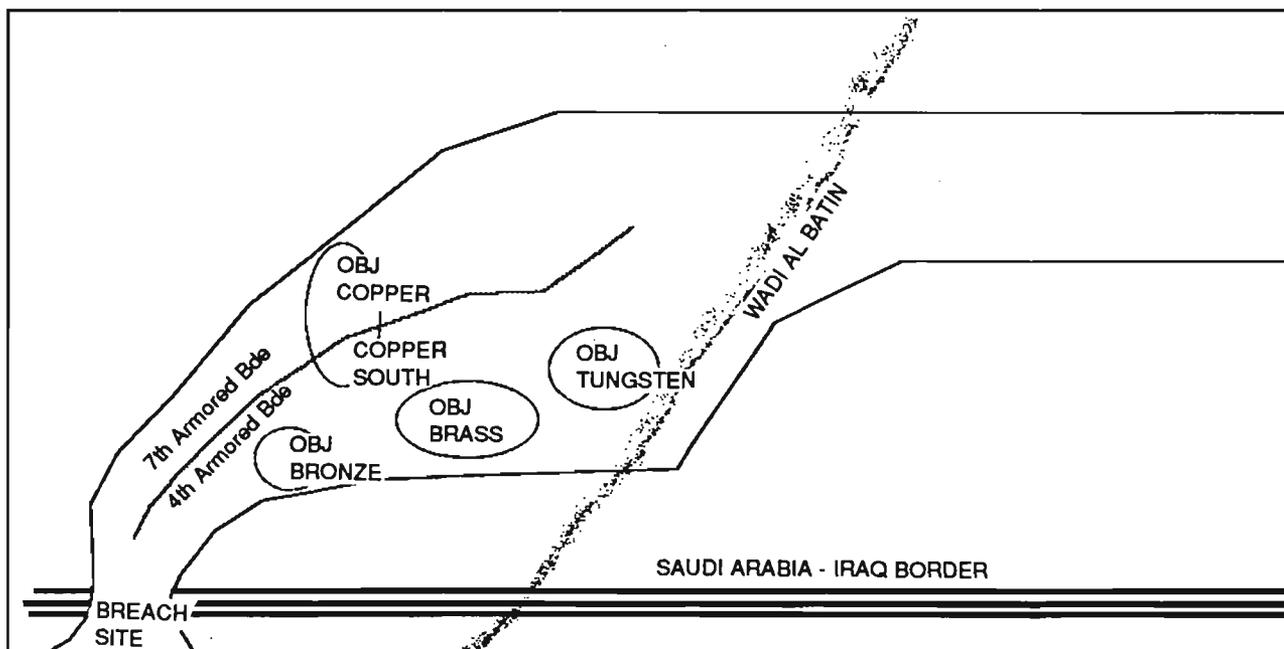
Brigadier Hammerbeck organized his brigade into three mixed battle groups, which — due to its being a



mechanized force — seemed to him more suitable for a running desert battle. The battle group is the normal combat organization in which the armored division fights. The composition of the battle group itself leaves the commander much flexibility. In theory, it would be a balanced mix of armor and infantry, with support. But the actual mix could vary to suit mission requirements. In fact, during the

ground campaign, 4th Armored Brigade changed its battle group mix several times as the fluid battle situation demanded.

From the start, 4th Armored Brigade was organized into three battle groups, one based on the armored regiment, with a company of Warrior IFVs supplementing the infantry element; the other two were infantry-



squadron in close support. The brigade received Scorpion and Scimitar elements from the divisional reconnaissance regiment, the 16/5th Queens Royal Lancers, to serve as reconnaissance screen, a must in desert warfare.

Fourth Armored Brigade crossed the line of departure around 1930 on G Day, the main brigade axis led by the 14/20 Hussars battle group commanded by Lieutenant Colonel Michael Vickery. The 1st Royal Scots battle group advanced along a parallel route, with the third infantry-heavy battle group in brigade reserve. Brigadier Hammerbeck was traveling in a Challenger with his tactical command group of Warrior command vehicles. He could monitor the three command radio nets of the battle groups. His immediate objective was the destruction of an Iraqi armored reserve brigade. It was believed to be about 45 kilometers east of the point where the brigade swept through the breach in the Iraqi forward defense system. The night was pitch dark, with pouring rain, and shortly after crossing the start line, the British vehicles ran into the tail of a massive convoy of trucks. They were moving behind elements of the U.S. 1st Infantry Division that had originally made the breach. After a delay of about one hour, while commanders sorted things out, the brigade

was moving again toward its Objective BRONZE, the southern complex of an Iraqi divisional defensive system. The northern end of this complex, code-named COPPER, was the objective of a two-battalion attack by 7th Armored Brigade. First contact on BRONZE was made G+1 at 2030 hours.

During the advance, columns of vehicles were delayed by unexploded munitions in the lanes, mainly from MLRS and CBU cluster munitions that did not have delay fuses. The passage through the U.S. 1st Infantry Division lines was done with perfect precision, traffic control handled mutually by American and British military police. Objective BRONZE was taken rather quickly with little opposition from the Iraqis, who were surprised by the rapid attack. Attention shifted to the 7th Armored Brigade's attack on COPPER, which was the larger compound. After midnight, Brigadier Hammerbeck shifted his tank-heavy battle group to the north to assault the southern part of COPPER, which was already under attack by the two 7th Armored Brigade battle groups mopping up the northern half. As the tank attack went in, opposition stiffened considerably, and the Challengers used their thermal imaging optics to knock out Iraqi tanks hiding

behind sand berms. A running fight developed, with several Iraqi tanks blowing up in flames. At the height of the battle, Hammerbeck decided to bring in the Royal Scots battle group, which went in to clear the enemy trenches, dismounting from their Warriors as they came upon the Objective COPPER SOUTH.

The weather played havoc with the thermal imaging equipment of the Challengers (TOGS). As the leading tanks set off into the dark, the rain descended like treacle, the dust thick with soot from the Iraqi oil fires in Kuwait to the east. Tank gun engagement ranges came down to 500 meters and less. After three weeks of enduring intensive air attack by systems employing thermal weapons, the Iraqis had quickly discovered that a "cold" tank could survive. Iraqi tank crews became quite adept at hiding their tanks from thermals, even removing batteries to prevent heat signatures.

As the two battle groups fought on COPPER SOUTH, it soon became clear to the brigadier that he had encountered a much stronger enemy position than had been anticipated. Initial briefings had indicated COPPER SOUTH to contain a maximum company-sized force of tanks and infantry. Actually it turned out to be a full-



British Warrior infantry fighting vehicles maneuver on an objective after penetrating the Iraqi defensive belt.



sized armor-heavy battle group with over 25 tanks!

The Challengers main armament — a rifled 120-mm cannon — proved highly lethal, and its effect on Iraqi tanks was devastating. Secondary explosions often blew turrets off hulls, while after-battle inspections showed catastrophic results, with interiors turned white from intense heat.

On G+2 at 0945, the attack on Objective BRASS began. The two battle groups arrived on the start line and deployed into battle formation. BRASS was a large position which contained the major portion of the Iraqi 52nd Armored Brigade. In the west, it consisted of an infantry-heavy battle group, a company of about a dozen tanks, and two companies of MTLB carriers in berms. All were deeply entrenched in fortified positions. In the center was a heavy armored battle group with some 30 tanks and lots of carriers with artillery support. More artillery was deployed farther to the east, but within range.

Hammerbeck ordered the Royal Scots battle group to attack BRASS 1, and as they stormed forward in their Warriors, they were met by heavy enemy artillery fire. The battle group drove under its own burst barrage and made it, without loss, to the outer defenses, where the bombardment stopped. Then A Company dismounted and started clearing the forward trenches, using grenades and CLAW close assault weapons. Very quickly the enemy troops started to come out of their bunkers to surren-

der. Meanwhile, tanks of the 14/20 Hussars were attacking BRASS 2, which involved a very long approach march. Joined by the brigadier's tactical command group, the tanks attacked, firing from long ranges, knocking out hidden Iraqi tanks behind berms. Within the hour, before midday, the position was secure.

By 1500, BRASS 3 had also been cleared by the Fusilier battle group after two hours of fighting in the trenches. Also at about that time, U.S. Air Force A-10 tank-busters mistakenly identified a column of Warriors as enemy vehicles and blew up two of them, killing nine soldiers inside the vehicles and wounding seven others.

Soon, orders came over the radio for the next stage, an attack on Objective TUNGSTEN. This required a quick orders group. TUNGSTEN was to be taken by night attack after a difficult approach march that had to cross the Tapline Road, including crossing of a large overground pipeline some two meters high. To overcome this obstacle, engineers were attached to each battle group to construct passages. The battle for TUNGSTEN was a set piece attack, aimed at what was thought to be a brigade-plus enemy force in well constructed fortifications. A massive artillery bombardment plan included two brigades of artillery, the 142nd Artillery from the U.S. National Guard, with MLRS, as well as most of 1st UK AD divisional artillery, with two batteries of MLRS and several of SP guns. This added up to a lot of firepower, perhaps the largest number of guns on a single objective during the campaign.

The brigadier's TAC command group motored forward, setting up near the scouts to watch the spectacle. It was an impressive display of fireworks. For 45 minutes, the rain of steel kept coming down with a running roar, exploding into a carpet of

fire across the full depth of the Iraqi position. As soon as the bombardment ceased, the Royal Scots and Fusiliers battle groups found a crossing point over the pipeline and stormed into the enemy position, knocking out everything in sight that still stood. Stunned survivors soon came out of their underground holes and surrendered. For the attack on TUNGSTEN, Hammerbeck had changed his dispositions, creating two "square" battle groups, each with two squadrons of Challengers and two with Warrior IFVs. Having already seen heavy fighting, the 14/20 Hussars battle group was left in reserve, with one squadron of tanks and one company of armored infantry. Throughout the night, the two battle groups worked their way across a series of Iraqi positions, with Challengers giving close support with direct fire from main armament and coaxial machine guns on call by the infantry commanders advancing inside the Iraqi defense complex. By dawn it was all over. Thousands of Iraqis were coming forward to surrender, including two brigade commanders and a major general who commanded a division. At TUNGSTEN, the 4th Armored Brigade had defeated remnants of the Iraqi 12th Armored Division and reserves from the 25th Infantry Division.

After a short rest and replenishment, new orders called for the advance to continue to the north and reach the Kuwait-Basra highway to seal off any southward movement by Republican Guard armor, which was already hard-pressed by the maneuver of VII Corps and XVIII Airborne Corps.

The brigade had prevailed through a remarkable campaign. It advanced 350 kilometers in 97 hours, fought several major battles, and destroyed more than 60 enemy tanks, many guns, APCs, and other vehicles. Some 8,000 prisoners were taken. Out of the 59 Challengers, 53 reached the end of the battle intact. Over such distances, this was a remarkable technical achievement by crews and maintenance men.

Throughout the division, Challenger had more than proven its battle worth. There had been initial fears making the rounds in the British Army as to its combat value, mainly due to its dismal failure in the 1987 Canadian Army Trophy gunnery competition in Germany. However, the British did not take chances. As they arrived in the Gulf, vehicles were modified by special maintenance crews flown out to Jubail by Vickers, the tank manufacturer. They set about improving the tanks for their oncoming combat assignments under desert conditions that were much different than those expected in NATO. Special cooling fans and air filters were fitted, and TOGS systems (the Challengers' thermal sights) were adjusted. Add-on armor suites were mounted to enhance survivability against shaped-charge rounds and hand-held antitank weapons. The results speak for themselves. During DESERT SABRE, there were 24 powerpack changes in the field, and out of a total of 176 tanks which had crossed the start line on G Day, only two had dropped out by day two, due to accidents.

Though Challengers did not suffer any hits from enemy guns or antitank weapons during the fighting, a Warrior survived being mistakenly hit by a British HESH round, which fortunately struck the add-on ceramic armor and did not penetrate. Oddly, the add-on armor actually improved the cross-country ability of armored vehicles: the additional thickness along the outer skirts reduced the vortices around the vehicle when moving over desert sands.

The ammunition most widely used by Challenger gunners was the L31 HESH, which might surprise some advocates of the smoothbore 120-mm tank gun. (A HESH, or High Explosive Squash Head round, explodes on contact like a HEAT round. But where a HEAT round's shaped charge sends a metal jet through the armor, a HESH warhead's payload of plastic explosive detonates in contact with

How a HESH Round Attacks Armor

A HESH round is a full-caliber, thin-walled shell that contains plastic explosive. On impact, the shell crushes and the explosive spreads across the armor before it is ignited by the base fuze.

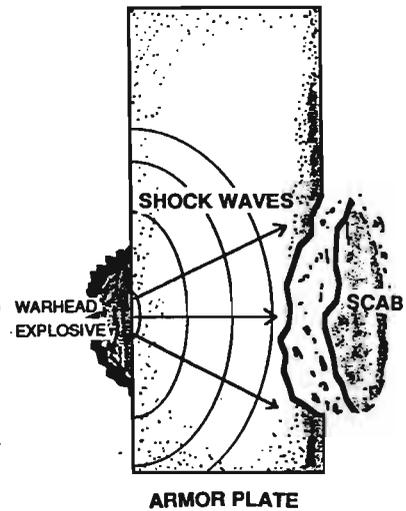
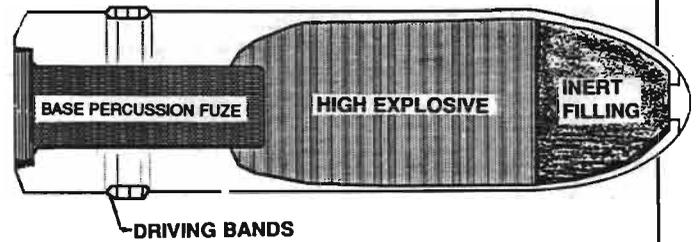
Like the HEAT round, it is a chemical energy, rather than a kinetic energy, round. It was once common in the U.S. inventory as the HEP (High Explosive Plastic) round for tank guns.

The Kill Mechanism

The round impacts, depositing about seven pounds of plastic explosive in direct contact with the tank armor. The delayed fuze at the base then detonates the explosive, causing compressive shock waves to radiate forward.

As these waves reach the back side of the armor plate, they reflect back as tension waves, reinforcing the shock wave to the point where it exceeds the strength of the armor. The inside surface of the armor plate then begins to break up and a "scab" of the armor detaches inside the tank. This scab, larger than the diameter of the HESH shell, rapidly accelerates to speeds approaching 300 mph. Note that HESH makes it possible to destroy a tank's armor without penetrating.

HESH rounds are also useful against concrete, as "bunker busters," but can be defeated by even a thin layer of spaced armor. Another limitation is a long time of flight to the target.



the armor and destroys it by shock effect. - Ed.) Many strongly believed that the rifled British 120-mm tank guns were outdated and that HESH rounds were obsolete against modern armor. But the British gunners had actually fired more HESH rounds than any other ammo during the 100-hour engagements. It was used to destroy enemy APCs, bunkers, and fixed positions. Even older type tanks were knocked out by HESH rounds. With engagements fought at night through thermal imaging gunsights, a hit with HESH showed up clearly as massive thermal flashes, much more brilliant than those produced by any other anti-tank rounds.

The Challenger proved its worth in combat. Brigadier Cordingly, the commander of the Desert Rats, paid tribute to its effectiveness by stating that "Challenger is a tank built for combat and not competitions."

One example of a gunner's skills illustrates this. A Challenger of the Royal Scots Dragoon Guards actually destroyed an Iraqi tank with a first-round hit at a range of 5100 meters, a remarkable achievement even on a peacetime gunnery range.

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Soldiers in the Storm

Making the Best of a Bad Situation

by Captain Joel C. Dotterer

Over the past year or so, many great warriors wrote articles about how their unit fought heroically, or how they skinned a particular type of tactical “cat” while operating in Southwest Asia. These articles are quite enlightening and portray the Armor Force to be a potent thunderbolt on the battlefield. This, however, is not that type of article.

My intent is to show another side of the desert conflict. There will be no chest thumping about how I thought my unit fought, how my unit actually fought, or how I describe my unit’s fight after a drink or two at the club. This is simply one trooper’s view of how the American fighting man made do as best as he could with the resources he had at hand while he waited, and waited, and waited.

If you choose to read this article, you will see descriptions of several “inventions” that I witnessed while serving for five months in SWA. Remember while you read, that these

items were created out of need, or the desire to make life a little easier in the desert. The inventor often had only simple tools and a vivid imagination to accomplish his task.

The Chair

I doubt that you could find someone who crossed into Iraq who doesn’t wax a little emotional when talking about this simple device. By no means a new product, the chair, nonetheless, merits the number one ranking in this list for its contributions to the fighting man’s dignity in the often undignified pursuit of personal hygiene.

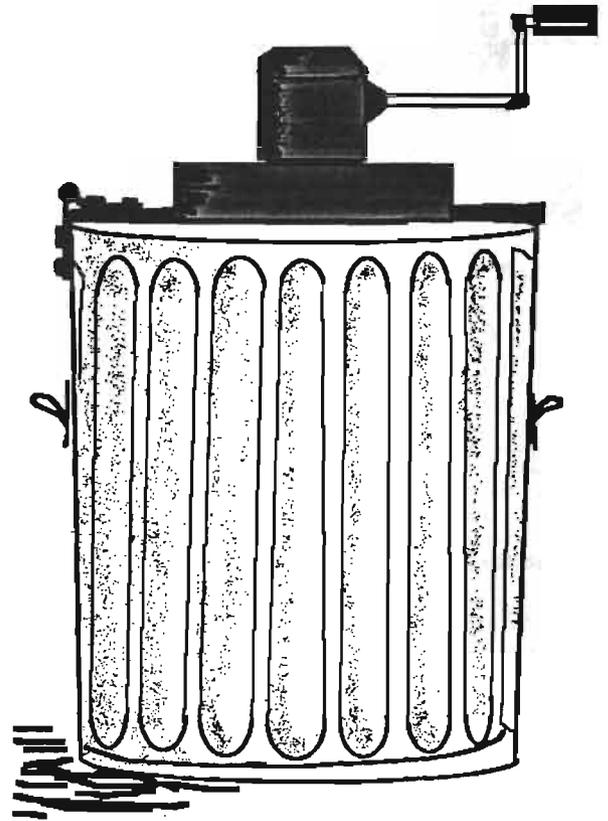
By simply taking a folding chair and bartering for some cutting torch time, you could have your own private throne — a ticket to solitude when you need it most. Most units I knew had at least one chair per platoon. I even heard tales of troops taking Hummers out of the perimeter to get to a particular vantage point to better

enjoy the moment. However, many a private moment was destroyed by the ever curious Bedouin and his camels.

The Washing Machine

From buckets to Bedouin pans to burials at sand, our soldiers fought to find a better way to do the dread job of laundry. I saw many techniques, but the best, created by a mechanic from scrap parts, was a genuine washing machine. Simple, portable, and capable of washing one week’s worth of a trooper’s laundry in one fell swoop.

The machine consisted of a standard 32-gallon trash can. From there, it got a little complex. To start, he used a broken right angle drive to which he brazed a crank handle and a paddle assembly composed of camouflage net paddles. He mounted this on a plywood lid, then attached it to the trash can with some old hinges. Presto! Maytag couldn’t have done any better if it tried. Now all you needed was



some water and a strong arm for cranking. As I recall, this machine received maintenance priority par with the tanks until we crossed the berm.

The Shower

At first, we had these wondrous affairs, a wooden shelter with a water tank on top and three shower heads below. Guaranteed to get you wet, mildly hypothermic, and covered with sand by the end of your shower. No wonder it was so hard to get the troops to go in there! Some improvised by sealing the showers in plastic to keep out the wind, and by putting immersion heaters in the water tanks to get the temperature above the glacial level, but it was all to no avail. No sooner did we figure out how to do it right when we were ordered to move west — never to see our luxury showers again.

It was back to the bucket brigade — the infamous “whore bath,” squatting over a bucket while your peers jeered at you. Kind of took the sport out of cleaning those hard to reach areas. Again, it was a mechanic to the rescue. One day I noticed a neat pile of tools outside the tool truck and the sounds of drilling and sawing coming from within. When I investigated, I saw what appeared to be a shower stall inside the tool truck. After a brief conversation covering the use of Army equipment, the mission, and the status of things in general, I came away with the feeling that I had just lost a battle, and the hope that he actually could make it work.

The shower consisted of a five-gallon water can modified by adding a hose and shower head to the bottom, and a tire pressure stem to the top. After filling the can with hot water, you simply pressurized the can courtesy of a small compressor in the truck, then regulated the flow of water with a switch on the shower head. The stall was modest and tight, but for the effort of heating five gallons of water, you could enjoy a luxurious hot shower out of the wind with a private

place to get dressed. This device did more for the troops’ morale than any number of sundry packs could hope to do.

The Generic Map

Not all of the devices I saw created revolved around washing, cleaning, or heeding nature’s call. This item, created by my commander, served our company well every time we left the perimeter — be it on a parts run or actual combat operations.

It consisted, quite simply, of featureless 1:50,000 scale maps that were covered with acetate and fit into a cardboard “book.” We gathered the blank maps from the hundreds that we received in our initial issue. All you had to do was gather map information such as grid numbers from an actual map, then transfer it to the generic map. Because the majority of the terrain that we operated on was essentially flat with few recognizable features, this generic map system allowed us to navigate rapidly without having to switch map sheets every few hours. Once you applied your graphic control measures, you could easily calculate distances and azimuths for navigation.

This simple yet effective system, used by vehicle commanders at all levels, allowed the company to have standardized graphics and overlays, thus simplifying command and control in the desert.

Power Supply

One of my bigger headaches as company XO was the procurement of batteries. Oftentimes I would scour the desertside looking for small VINCINSON batteries or the trusty old BA-30 in order to keep our equipment running. Luckily, a closet electrician came forth in the company.

This magician, armed only with a soldering gun, a multimeter, and some broken transistor radios proceeded to make long-life power supplies for our equipment by wiring PRC-77 batteries

(of which we had plenty) to equipment such as our LORANs. This freed up batteries for use in PVS-7s and other equipment. It also prevented the troops from taking their precious store-bought batteries out of their radios to power night vision devices resulting in a great increase in morale. Our electrician also fabricated a vehicular power supply for our GPSs (we received the CENTCOM approved wiring harnesses just before redeployment) which dramatically increased our navigational abilities.

During the course of a five-month tour in SWA, I saw many unique solutions to everyday problems originated by soldiers at all levels, from commander to private. I think it reflects well on the inherent strength of our troops to overcome adversity no matter how bleak the outcome looks.

Throughout this brief article, I described some, but by no means all, of the inventions created by soldiers that I served with. While I didn’t intend this to be a “Mr. Science” article giving you step-by-step directions, I do hope that it has brought back some memories of young “Thomas Edisons” that you may have known, or at least given you a little insight into the initiative that American soldiers will take when given the opportunity.

Captain Joel C. Dotterer received his RA commission as a Distinguished Military Graduate of the University of Alaska at Fairbanks. A graduate of AOBC, SPLC, IMPOC, and AOAC, he has served as a tank, scout, and support platoon leader, and company XO with 3d Squadron, 2d ACR, Amberg, Germany. He is currently assigned to 3d Brigade, 1st Cavalry Division, Fort Hood, Texas.

Minefield Breaching: Doing the Job Right

by Major Drew A. Bennett, USMC

Mines are a cheap and effective way for the enemy to create obstacles. Modern antitank and antivehicle mines are highly sophisticated and include blast resistant, pressure sensitive mines, magnetic mines that are detonated by changes in the magnetic field, and double-impulse mines which must be triggered or hit twice before they detonate. Minefields are used in conjunction with other obstacles and are covered by enemy fire, making them inherently dangerous. The Belvoir Research, Development and Engineering Center reported that about half of the combat deaths during Operation DESERT STORM were caused by mines.¹ Therefore, it is imperative that armor units can breach enemy minefields quickly and with minimum casualties.

Current minefield breaching efforts for armored forces use the equipment and skills of both engineer and armor units but has its limitations. The equipment is designed for the initial tracked vehicles only, and it doesn't defeat many of the types of mines encountered. Today's minefield breaching equipment takes too much time to clear a lane, and the cleared lane is limited to where a tank's tracks will follow, leaving a gap down the middle. The gap must be cleared before follow-on tracked vehicles begin to compress the lane and bottom out on the gap, and before wheeled vehicles with a dissimilar wheel base can proceed. Facilitating the movement of dissimilar vehicles becomes critical when operating in the joint or combined environment. The solution to this problem is to use minefield

breaching equipment designed to clear all types of mines from the entire width of a tank, thus eliminating the gap and allowing the movement of initial tracked vehicles, follow-on tracked vehicles, and wheeled vehicles used by the Army as well as other services and allies. This article examines the problems with current minefield breaching equipment, explores potential solutions, and offers a recommendation for the future.

Problems

The first step in breaching a minefield is to use the Mine Clearing Line Charge (MICLIC) found in engineer units. The line charge is towed in a trailer behind a tank or Combat Engineer Vehicle (CEV). A rocket is fired, which pulls a line of explosives across the minefield. The explosion creates an overpressure which clears a lane approximately 14 meters wide and 100 meters long.

There are numerous deficiencies in the MICLIC. First, the system uses WWII technology and has a significant failure rate.² Second, even if the system works as advertised, and if the driver accurately estimates the 62-meter standoff distance needed from the launcher to detonation point, it clears a lane that is only 100 meters long. Minefields of greater depth require multiple MICLICs. Another disadvantage is that the rocket carrying the line charge does not always fly



An M1A1 passes through the berm into Iraq.

perfectly straight. This can result in a line that is snaked or has numerous turns. This reduces the length of the cleared lane and complicates proofing efforts. An additional problem caused by the speed and direction of the blast is the creation of a "skip zone" where mines are not affected by the overpressure. Mines that are in the skip zone, located .75 to 1.5 meters either side of the charge, may not be detonated. Finally and most important, the



MICLIC LINE CHARGE



At left, a Caterpillar D-7 with an armored cab and full-width mine rake attachment. Above, the mine rake attachment for the Combat Engineer Vehicle. Mine rakes are most effective in loose sand.

MICLIC is designed for use against surface-laid, single-impulse, pressure-sensitive mines. The line charge does not detonate magnetic, nonpressure-sensitive, or double-impulse mines. If these mines are buried properly, or placed with any type of anchoring device, many will not be blown out of the lane.

Because of the numerous deficiencies in the MICLIC, after a path is blown through the minefield, it is necessary to "proof" it by clearing blast-resistant, magnetic, or double-impulse mines not detonated by the overpressure or thrown out of the lane by the blast. Two types of minefield-proofing equipment are used today: a track-width mine plow (TWMP) and a track-width mine roller (TWMR). Both pieces of equipment are maintained and used by armor units. The mine plow and the mine roller are produced as separate kits; either kit can be mounted on the front of an M1A1 tank. The mine plow scoops up the mines in front of the tank and pushes them off to the side. The TWMP leaves a gap that is 64 inches wide. Within this gap, the guide rails or "float assembly" for the plow will clear most single-impulse mines, leaving a gap of only 26 inches. The mine roller detonates the single-impulse mines in front of the tank. The TWMR leaves a gap that is 72 inches wide. Either system can employ a magnetic signature device to defeat magnetic mines.³

The TWMP and TWMR have several shortcomings. Double-impulse mines are not cleared by a mine roller. Antipersonnel mines, which are smaller than antitank mines, may slip between the teeth of a mine plow. Antipersonnel mines, particularly the bouncing variety, can be dangerous to unarmored, wheeled vehicles. Another problem is caused by repeated crossings of heavy vehicles through the same lane, particularly when breaching over sand or mud. As additional vehicles, weighing close to 70 tons, move through the lane, they dig out and compress the trail until the vehicles "bottom out" and the bellies of the vehicles sink down far enough to hit the gap. Additionally, the TWMP and the TWMR are designed to facilitate the passage of tracked vehicles with a similar width. The remaining gap must be cleared in a slow and complicated process for vehicles with a dissimilar width, which include many wheeled vehicles.

Clearing the gap is slow and tricky. The least preferred method, due to the time and danger involved, is to clear the gap manually, using hand-held mine detectors. The increased use of plastic mines makes detection much more difficult. The soldiers must stop, set an explosive charge on each mine, withdraw to a safe position, then blow the mine "in place."

The preferred method is not much better. This method removes the gap mechanically. A proofing vehicle off-

sets to the right side of the original lane and, depending on the method used, either plows up or rolls over the gap. The offset lane must exactly match the original lane. Smoke and dust on the battlefield make this procedure extremely slow and difficult.

Another factor is the plowed-up dirt, called the spoil, produced by the mine plow. A TWMR cannot widen a lane that has been initially plowed, because it will run into the spoil, which is loaded with plowed-up mines. When using both types of equipment, a TWMP should follow a TWMR.

If only one vehicle is proofing, three trips must be made. The first trip is from the friendly side to the enemy side to make the original proof. The second trip is from the enemy side back to the friendly side to widen the lane. The third trip is from the friendly side back to the enemy side to continue the assault. In order to limit the number of trips, reduce the time necessary to breach, and keep combat power moving toward the enemy, at least two proofing vehicles are needed per lane. However, if a TWMR is used, double-impulse mines will not be defeated; and if a TWMP is used, antipersonnel mines will not be defeated.

Potential Solutions

In place of the TWMP and TWMR, vehicle-width equipment should be used. There are several examples of

this concept in use today. The Israelis use a "full-width" mine plow mounted on either a D-8 or D-9H bulldozer chassis.^{4,5} The Israeli plow clears a path that is five meters wide, but it cannot keep up with the more mobile armor units.

The U.S. Army has just adopted a Combat Engineer Vehicle Mine Clearing Rake.⁶ The rake is mounted on a tank chassis and clears a path that is 125 percent of the tank width. This vehicle was used during the Persian Gulf War. Because it is a rake instead of a plow, it is limited to sand and loose soil.

Finally, the Marines used a field expedient vehicle-width mine roller as they breached the two Iraqi minefields during the ground assault into Kuwait. This mine roller, nicknamed a "roller dude," was built by a detachment from the Navy Construction Battalion. Simple in design, it was a section of steel pipe, about four feet in diameter, extending across the width of the tank. The pipe was filled with cement, equipped with a movable axle, and mounted on the front of the M60 tank.

Vehicle-width clearing devices are heavier than track-width devices. This extra weight can slow a tank, increase its fuel consumption, and strain its engine. In order to address this problem, the Army is evaluating a Combat Mobility Vehicle (CMV) designed specifically for engineers. This vehicle would have a full-width mine plow and a deck-mounted powered arm for digging, lifting, and obstacle reduction of ditches and berms.

There are four immediate problems with this concept. First, depending on the chassis of this vehicle, the CMV may not have the mobility to keep up with modern armor units. Second, this vehicle will be much more expensive than a kit that attaches to a tank. Third, if approved, the fielding of the CMV will not take place until well into the next decade. Finally, this vehicle is designed for engineers and will not be organic to battalion-size armor units. It is best suited for ex-

panding, not making, the initial breach.

Recommendation

An interim approach and complementary measure to the CMV program would be to develop vehicle-width clearing devices to be employed as kits and mounted on the M1A1 tank. Using current technology, computer assisted design, and stronger yet lighter metals, the U.S. should be able to develop vehicle-width mine plows and vehicle-width mine rollers that can withstand multiple blasts and still clear a lane without significantly degrading a tank's performance. The vehicle-width mine plow or roller can be incorporated into the CMV program, fielding the kit long before the CMV itself is ready for production.

The benefits of a vehicle-width device far outweigh the cost of replacing the track-width devices currently used. Vehicle-width breaching devices clear a lane in one pass without leaving a gap. This procedure allows jeeps, trucks, and other vehicles of dissimilar width to proceed immediately. A full-width mine plow, followed by a solid, lightweight, full-width mine roller, will clear the lane of all antitank and antipersonnel mines, allowing tracked vehicles, wheeled vehicles, and dismounted troops to move through.

It is conceivable that both of these devices, designed as kits, could be mounted on one tank with the mine plow in front and the lightweight mine roller trailing behind the tank. When vehicle-width clearing devices are used, the flow of combat power is not impeded, and the minefield does not become a choke point, creating a lucrative target for the enemy.

To effectively counter the growing proliferation and increasing lethality of mines, the U.S. Army needs to develop vehicle-width clearing devices to replace the TWMP and TWMR.

Notes

¹Desert Storm Countermine Equipment, brochure released by Belvoir Research, Development and Engineering Center, Fort Belvoir, Va., p. ii.

²Vernon Lowrey, "Initial Observations by Engineers in the Gulf War," *Engineer*, Oct 91, 45-46.

³Colonel James A. Marapoti, "The Breaching of Simple and Complex Obstacles," *Marine Corps Gazette*, Jan 91, 17.

⁴Major Michael C. Howard, USMCR, "Combat Engineer Lessons From the Israelis," *Marine Corps Gazette*, Jan 91, 24.

⁵Christopher F. Foss and Terry J. Gander (Editors), *Jane's Military Vehicle and Ground Support Equipment: 1986-1987*, Jane's Publishing Company Limited, London, p. 285.

⁶Staff, "Engineer Update," *Engineer*, Apr 91, 62.

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FM 90-13-1, *Combined Arms Breaching Operations*.

Major Drew A. Bennett, an active duty Infantry officer, wrote this article based on his experience as the S3 operations officer for a U.S. Marine Armor/Mech battalion, which breached two minefields in Kuwait during Operation DESERT STORM. His unit, 1st Battalion, 7th Marines, arrived in Saudi Arabia on 14 August 1990, and spent the next six months studying, practicing, and rehearsing armor/mech breaching operations as part of Task Force Ripper. A graduate of the Marine Corps Command and Staff College, he holds a BA Degree in history from Tulane University, an MS Degree in Human Relations from Golden Gate University, and a Ph.D. in Adult and Extension Education from Texas A&M University. He is currently attending the Marine Corps School of Advanced Warfighting (SAW).



Tanks and Urban Combat

by Lieutenant Colonel William R. Betson

Military operations on urban terrain (MOUT) are among the most complex, demanding, and bloody forms of war. Experience at Aachen, Manila, Seoul, Hue, and Panama City notwithstanding, it is also an area to which we in the United States Army devote little real effort. If the Army in general has given short shrift to the MOUT problem over the years, we in Armor have ignored it almost completely. Virtually no tank units practice techniques of city fighting. We simply declare our desire to avoid built-up areas, and thereby wish the problem away.

Thus, one should not be surprised to discover that what MOUT doctrine we have is weak, and seems written for an army equipped and manned like the one that we had in 1945. Further, doctrine for tank employment is virtually nonexistent. The limited cov-

erage that MOUT receives in FMs 71-1, 71-2, and 71-123 are no practical help to the lieutenant, captain, or even the lieutenant colonel. Infantry manuals are not much better, and FM 90-10, the MOUT manual, was last updated in 1978 — before the impacts of precision weapons and modern armor were fully understood. To try to apply our current “doctrine” today (if we can even apply such a grandiose title to what we now have) we would need World War II-style heavy infantry (not mech) units. Even so, these foot soldier-rich units would suffer casualties that we could not accept today. Our current units would have difficulty applying these tactics. Heavy units are too infantry poor, and light units do not have the firepower.

So what do we do? Clearly, we do want to avoid city fighting when we can. But what if we cannot? We could

not in Panama. I firmly believe that we would not have been able to in urbanized West Germany. Too often, a major objective (such as a capital or seat of government) will be in a city. Also cities or villages often lay astride lines of communication or block choke points in difficult terrain. Bypassed cities may also serve as places from which strong enemy units may foray against our rear. It, then, is also clear that we must be ready to fight in built-up areas, and we need doctrine to do so.

Such doctrine must take into account the demands of the likely conflicts that we could fight. It must keep damage and casualties, both our own and civilian, to a minimum. Massive, indiscriminate use of firepower is out. We must also assume that we will have a comparatively small amount of infantry (the small city of Stalingrad

consumed more infantry divisions than we now have in the Army). Thus, our doctrine must have two characteristics: it must not be manpower intensive, and it must maximize our firepower and technological advantages without laying waste to the area in which we are fighting.

The answer to this dilemma is to be found, I believe, in the M1A1 tank.

As a member of the Berlin Brigade, I have watched some of our best trained, city-fighting infantrymen in action. When applying our current doctrine, well rehearsed soldiers run across streets, supported by overwatching machine guns, and throw grenades into windows before they rush in to execute practiced room-clearing techniques. It is a squad and platoon leader's fight. Little opportunity exists for effective artillery and mortar support. Tanks, traditionally, are left to "isolate the objective" and cover armor counterattack avenues of approach. Sometimes, but only rarely, do they support by fire. We should not be surprised that tanks are forgotten or little used. Berlin's light infantry company commanders were lieutenants at Campbell, Ord, or Bragg where there are no tanks at all, and many of these infantrymen have never worked with tanks.

During force on force maneuvers, the result of these efforts are predictable by anyone who has read history. Infantry attacks either bog down in bloody fighting or succeed only at great cost. A defending company, equipped only with rifles and machine guns, stops a battalion in its tracks. Belatedly, tanks are called forward, but cooperate poorly with the infantry and are destroyed.

In Berlin, however, a unique situation exists where we are able to attempt to find answers to this problem. Light infantry and heavy armor are in the same unit and can practice together. Recently the 6-40 Armor and the 5-502 Infantry conducted an exercise designed to determine if a way

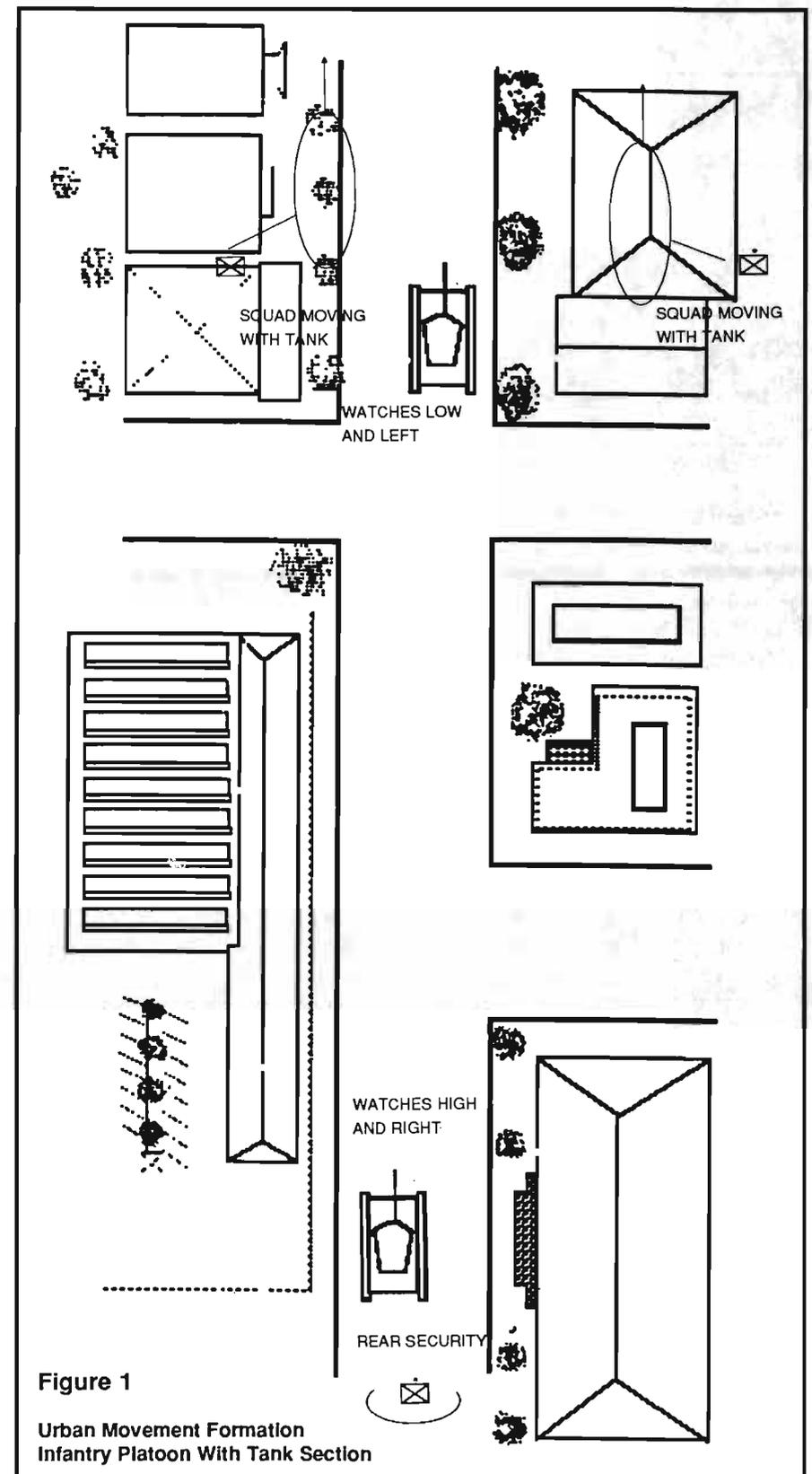


Figure 1

Urban Movement Formation
Infantry Platoon With Tank Section

could be found to fight offensively in the city and produce the results we require — low casualties and discriminate use of firepower.

The exercise involved two M1A1 (heavy armor) tank companies, one

light infantry company, and one platoon from the British 1st Battalion, The Royal Welsh Fusiliers. Lasting four days, the operation consisted of multiple offensive STX lanes in which platoon- and company-sized combined



Tanks and infantry on the attack in "Doughboy City"

arms teams attacked defending forces of various sizes. On the first day, tank and infantry units developed and rehearsed techniques and learned each other's capabilities. For the second and third days, infantry platoons and tank sections repeatedly attacked different enemy forces of squad-platoon size. The problem culminated with a day of company attacks against an enemy of reinforced platoon size. The defending enemy had no tanks, but had AT weapons, and laid mines and wire. Each attacking element assaulted a different portion of Berlin's "Doughboy City" combat-in-cities facility during each iteration.

A large controller package, supplied by 6-40 Armor's TOW company, ran the battles and assessed some of the casualties. They carefully adjudicated the effects of 120-mm fire on buildings and caused tanks to be "damaged" by RPG fire when necessary. Much controller judgment was required, as normal CTC MILES rules do not account for the fact that .50 caliber bullets go through walls, and main gun fire kills people inside of buildings. I should note that all of the controllers were infantry officers or NCOs, so there was no "tank favoritism." Casualty evacuation and obstacles were also played and strictly enforced IAW CMTC rules. Further, "civilians" were included in the scenarios, and the U.S. forces had to avoid shooting them and evacuate civilian casualties.

Twenty-eight separate battles were fought, and careful AARs were held

that enabled us to arrive at some clear conclusions concerning tanks in cities and good techniques for infantry-armor cooperation.

Conclusions

- The advent of modern armor has changed the city fighting equation. Tanks are decisive if properly used. When employed correctly they are nearly invulnerable to hand-held AT weapons, and large, missile-type AT weapons are difficult to employ in urban terrain. When working together with infantry, the M1A1/foot soldier combination was unstoppable. Our results demonstrated that when tanks and infantry failed to cooperate, the attacking force normally suffered 10-25 casualties and lost at least one tank while attacking a 5-10 man enemy force. If the tanks and infantry stayed and worked together, they could destroy that same 5-10 man enemy force while suffering only 0-2 friendly losses with no tanks destroyed. On two occasions, a 25-man rifle platoon reinforced by two tanks destroyed a defending 20-man enemy platoon while suffering fewer than three casualties.

- If the infantry got out ahead of the tanks, their attacks usually failed at high cost. Conversely, if tanks got out ahead of infantry, they were quickly damaged and often destroyed by fire from flanks and rear. See Figure 1 for an effective platoon formation.

- When properly directed, 120-mm and .50 caliber fire quickly eliminated enemy forces that resisted from buildings. The OPFOR soon learned that, even when equipped with RPGs and medium AT missiles, attempting to hold a building when tanks and infantry worked together was suicidal. They quickly adopted delaying or hide/stay behind tactics to have any hope of success. Also, we assessed that while overwhelming the enemy,

collateral damage from precisely aimed tank fire was relatively low. Care must be taken, however, to ensure that accompanying infantry take cover when tanks fire their main gun. Some pre-firing signal can be effective.

- The tank section and infantry platoon combination was the most effective. Larger tank formations could not function as a unit, and individual tanks were vulnerable after receiving minor damage. Also the trail tank could look and fire at upper stories while the lead concentrated at street level.

- The infantry platoon leader must be in charge, but the tank section leader (normally a platoon leader or sergeant) must be aggressive in selling his product and advising on the use of tanks. Tank leaders who waited to be told what to do usually failed. Often, a poor decision by a tank section leader had a more important impact on the battle outcome than a poor decision by the infantry lieutenant. Obviously, the infantryman must listen to the tank leader. In the earlier battles, the infantrymen often forgot about their tanks — after some experience, they never did in the later iterations.

- We need an external phone on our tanks. Placing the tanks on the infantry platoon frequency is a must, but not sufficient. An infantry squad member must be able to direct tank fire, and he does not have a radio. 40th Armor tankers lashed TA-312s to the side of M1A1s as a not-too-successful field expedient.

- Good techniques for infantry direction of tank fire must be worked out. Hand and arm signals must be practiced. Small arms tracer or M203 smoke work well to mark targets. All infantrymen, not just leaders, need to know the direction methods.

- Rear security is critical. The OPFOR soon discovered that stay-behind tactics were the most effective. Infantrymen should always be assigned to this role, no matter what the size of the unit accompanying the tanks (see Figure 1).

•Tanks should always keep tow cables fastened to their front slopes so that they quickly can recover other damaged tanks from behind while under fire. The infantry can help here. This is especially important in narrow streets where the enemy may often seek track, suspension, or engine/transmission hits to block the advance.

•Practiced obstacle reduction techniques are critical. The infantry should be trained in methods of clearing surface-laid mines quickly. (We use the "pop and drop" technique.) Tanks should have grappling hooks and ropes attached to their turrets. The TC or an infantryman can throw the hook and connect it to wire obstacles that the tank can then back up to clear away. Mine plow tanks would also be invaluable in MOUT fighting. Further, everyone, including tankers, must know how to breach minefields.

•An M1A1 fitted with a blade would be very useful to clear away rubble or barricades. CEVs are too vulnerable to hand-held antitank fire and are not very effective.

•Tank-generated smoke is extremely useful. City fighting tanks should receive DF-2 fuel. Care must obviously be taken if infantry and tanks operate in close proximity in smoke.

•During the advance, the cupola-mounted .50 caliber is useful for reconnaissance by fire. Because rounds often penetrate buildings, the weapon can suppress likely enemy positions. 120-mm rounds should only be used on identified enemy locations. The tank section can move by bounds so that the rear tanks can reload the .50 more safely. The .50's ability to elevate to near vertical elevation also helps.

•Tanks must stop and move intelligently. Stopping in the middle of an intersection invites fire from several directions and exposes the more vulnerable aspects of a tank. Tanks should try to keep one side close to a cleared building. Also, careful turning

of corners can keep flank exposure to a minimum.

•Tank crews must think 360 degrees. Sometimes, there is no way to avoid having the loader up and scanning to the rear with the M240. When he does, he should wear full body armor, to include kevlar helmet. Headphones under the kevlar can keep the loader tied to the intercom system. Stacking sandbags around the loader's hatch also gives some added protection.

•Thermal sights are very effective in the city. Tanks could detect the heat through the windows in a room with several OPFOR soldiers in it. TCs must take care, however, when using the GPS, and keep ballistic shields closed for all except brief periods. Most firing was done using the GAS.

•Resupply and casualty evacuation are particularly difficult in the city. The enemy will always try to infiltrate behind the advance and disrupt CSS. Casualty collection points must have a security element, and LOGPACs and even ambulances often must be escorted. Tanks or "hard top" HMWVVs can escort. CSS planning must be detailed, and CSS units prepared to fight at all times.

•Rehearsals are more important than ever.

•Finally, it was the modern armor of the M1A1 heavy tank that was decisive. The enemy was plentifully supplied with RPG-type weapons, and older tanks (such as the non-reactive M60) or lighter armored vehicles would have taken heavy losses. Every tank was hit at least once per iteration by RPG fire. The M1A1's ability to withstand such fire made it the devastating weapon that it was.

I make no claim that this list is exhaustive, or that all of our lessons have universal applications. We clearly need more experimentation. We should, for instance, take a serious look at how well Bradleys would fare in such an environment. Nevertheless, I believe that some results are clear. If we are ever again forced to

fight in a city, infantry task organized with heavy armor are the units we need to employ. Working together, they can make short work of any defensive position. Infantry alone, no matter how well-trained, is insufficient against determined resistance. Infantry with light armor will do better, but still take serious losses. Further, combined arms tactical success in the city will depend on excellent leadership at the platoon and squad level. Such excellence comes only from good doctrine, tactics, and techniques, and realistic, repetitive training. We clearly need to develop such doctrine and techniques, and this article is intended to make a modest contribution to that need. But even excellent doctrine will not work without practice, and we clearly need more of that.

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THE ARMORED GUN SYSTEM:

Sheridan Replacement Offers Better Firepower Plus Worldwide Mobility

by Captain John A. Nagl

The United States Army has selected FMC Corporation's Close Combat Vehicle Light, or CCVL, as the basis for the Army's new Armored Gun System. The AGS will replace the M551A1 Sheridan Armored Reconnaissance/Airborne Assault Vehicle as the primary armored vehicle providing light contingency forces with an armored direct-fire kinetic energy anti-tank capability.

The Close Combat Vehicle Light will be the basis for the AGS, but there will be changes in the system as testing and evaluation of the vehicle begin. Nevertheless, the basic outline of the AGS can be seen in the CCVL, and most of its capabilities will be similar to, or better than, those of the existing vehicle. This article will contrast the Armored Gun System with the M551 Sheridan, the weapon system it replaces, examine the tactical roles it was designed to meet, and report on many of the characteristics of the new system.

Role and Design Priorities

The Sheridan is currently the only armored fighting vehicle that is strategically deployable with contingency forces, yet retains the firepower and armor protection to engage in close combat with enemy armored vehicles. Officially designated the M551A1 Sheridan Armored Reconnaissance/Airborne Assault Vehicle, it is a Vietnam-era design with numerous disadvantages; its light aluminum armor does not provide its crew with sufficient protection to defeat modern anti-

tank weapons, and its 152-mm Shillelagh missile-firing main gun has a long time of flight and insufficient range. Taking advantage of newer technologies, the Armored Gun System will accomplish the missions the Sheridan has performed for nearly three decades more efficiently and with a greater degree of crew safety. The AGS, with its XM-35 105-mm main gun, is projected to have a range advantage of more than 1000 meters over the M551A1 Sheridan. Its compartmentalization of fuel and ammunition, and its improved armor technology, will increase crew survivability. In addition to superior mobility on the battlefield, it presents a smaller target than the Sheridan.

Several design dilemmas have challenged designers of armored vehicles since Leonardo da Vinci's day. The difficulties of combining the right proportions of firepower and armor protection, while retaining battlefield mobility, are amplified in a strategically deployable armored gun system because of weight considerations. In addition to a weapons system capable of acceptable firepower and sufficient armor protection, the system must remain operationally and tactically mobile, packaged within predetermined gross weight limits to ensure strategic mobility.

These realities demanded a very different set of design priorities for the Armored Gun System than those that led to the development of the M1 tank. The priorities used to design the AGS were, in order:



- Deployability:** The AGS had to be air-deployable from tactical aircraft.

- Lethality:** The system had to be able to destroy main battle tanks at extended ranges.

- Survivability:** The minimum requirement was armor protection for the crew against artillery, small arms, and light antitank weapons.

- Sustainability:** The AGS had to be able to fight for long periods of time with minimal external support.

While these priorities differ substantially from those used in the design of the M1 tank, the AGS mission is also substantially different. The AGS is not intended to engage in close battle with enemy main battle tanks. Its survivability comes as much from its low



At left, the CCVL prototype that will be the basis for the Army's new Armored Gun System. Because it uses existing components — HEMTT engine, Bradley transmission, LAV 105 primary sight, Challenger 2 fire control computer, etc. — less time will be spent in development

The Armored Gun System

While the Armored Gun System retains a conventional turret, it represents a major change in American armored vehicle design philosophy. The AGS will have a three-man crew, its loader replaced by an automatic loader with the ability to fire 12 rounds per minute from a 21-round magazine. The rest of the three-man crew sits in positions very similar to those occupied by the tank commander, gunner, and driver of the M1 tank. Much of the rest of the system will be built from components already in the NATO inventory, including a modified M977 HEMTT engine, a Bradley transmission and Bradley power control handles, and the Challenger 2 fire control computer. Using components already in the inventory cuts costs, improves reliability, and allows the Armored Gun System to be put into production more quickly.

profile, agility, and quickness as from its armor protection. The AGS is designed to be used as part of a combined arms team, protected by infantry, smoke, and terrain features when engaged in combat with superior forces. As such, it meets the infantry's pressing need for a direct fire kinetic energy tank-killing system, a capability the Sheridan cannot provide.

The Competitors

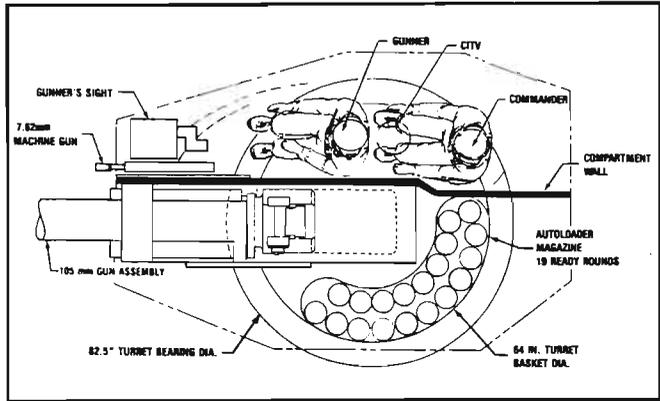
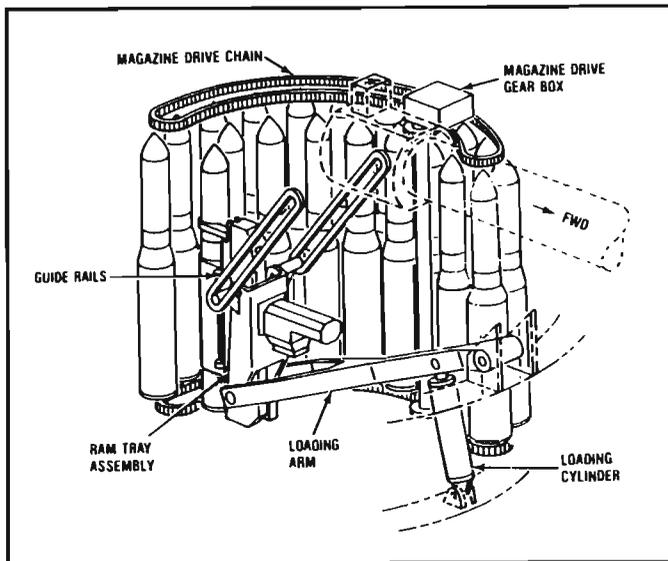
FMC's Close Combat Vehicle Light was only one of four weapon systems the Army evaluated for the Armored Gun System. All of the vehicles were designed to carry the XM-35 105-mm main gun, an already-proven design,

to be furnished to the winner by the Army.

While two of FMC's competitors also used a traditional turreted design, the team of General Dynamics and Teledyne Continental Motors developed a weapon system without a turret; the 105-mm gun was mounted on a pedestal directly above the hull, with the three armored crewmen inside the hull. This design presents advantages in both crew survivability and the ability of the gun to engage targets from a hull-down position without being detected, because of the smaller area exposed to the enemy. However, on balance, the capabilities of the Close Combat Vehicle Light were chosen as those most necessary for the Armored Gun System.

The Turret

Probably the most unusual feature of the AGS is its autoloader. In addition to the 21 rounds stored in the rotating magazine, each instantly accessible, nine additional rounds are stored in a compartment next to the driver. The vehicle can be uploaded by just two crewmen through a trap door in the rear of the turret. When a round is pushed through the trap door into the feed tray, the autoloader stores the round in the magazine. The gunner, entering information from a computer terminal at his station, tells the computer what kind of round it is. The autoloader then remembers where each



A major change in the AGS is the elimination of one crew member in favor of an automatic loader, seen at left. In sketch above, note compartment wall that separates and protects two turret crewmembers from autoloader mechanism.

round is stored in the magazine and loads that type of round when the gunner requests it. All rounds in the magazine are immediately accessible; they rotate rapidly around the autoloader on a chain belt at the base of the loader.

After firing, the gun returns to zero degrees elevation. The autoloader extracts the spent shell casing from the

important safety feature is the compartmentalization of the crew from the autoloader; a firewall splits the turret neatly down the middle. While the gunner can access the breech of the gun through a trapdoor from his station, doing so turns the autoloader off. This prevents parts of the gunner from being loaded — known to be a problem with Soviet autoloaders. There is

channels, and the tank commander will have an extension so that he can view targets seen by the gunner. The laser rangefinder will be similar to the one in the M1. Secondary armament is also the same, with an M240 coaxially mounted 7.62-mm machine gun. The commander's weapon station will be able to mount three different weapons: the M240, the M2 HB .50-caliber machine gun, and the Mark 19 automatic grenade launcher. The mix of secondary weapons mounted on the vehicle at a given time will depend on the mission and expected enemy situation. Additional protection will be provided by 16 visual/IR smoke grenades and an NBC overpressure system, similar to the one in the M1A1.



breech, then ejects it out of the turret through the same port used to load the autoloader. Once the autoloader has loaded the next round selected by the gunner, the gun returns to the elevation of the last target.

The XM-35 main gun will fire all 105-mm ammunition in the NATO inventory, including APFSDS, HEAT, HEP, WP, and APERS antipersonnel rounds. It will be able to traverse 360 degrees and elevate from +20 to -10 degrees.

If the autoloader is disabled or inoperative, the crew can load the AGS at a rate of three rounds per minute. An

also a hatch on the top left of the turret — about where the loader's hatch is located on an M1 — to provide additional access to the autoloader. There are, in fact, three hatches on top of the turret; for safety reasons, the gunner and tank commander will both have their own hatches.

The Hughes primary sight, adapted from the LAV-105 now in service with the U.S. Marine Corps, will have both narrow and wide fields of view with magnification levels comparable to those of the M1 tank's fire control system. Like the M60A3, the sight will provide both daylight and thermal

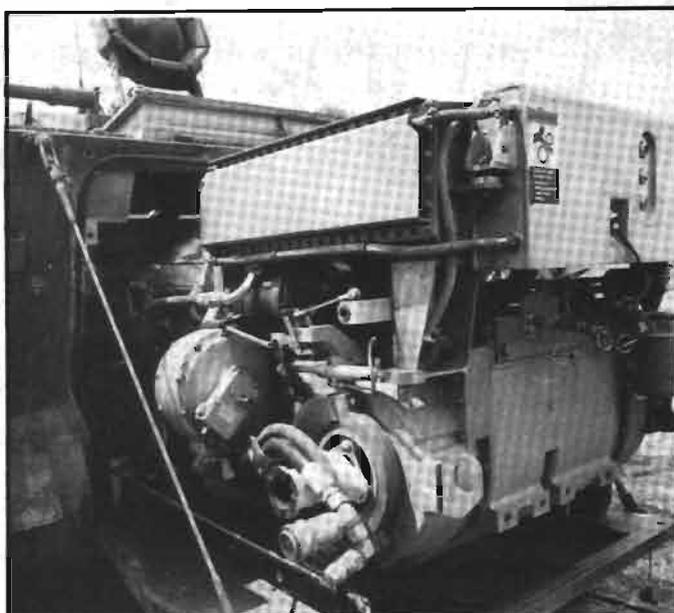
The Hull

The Armored Gun System will be powered by a 580-horsepower Detroit Diesel engine with integral diagnostics and a built-in test system. This powerpack gives the AGS a higher horsepower-to-weight ratio than that enjoyed by the M1A1 tank, and enjoys 92 percent commonality of repair parts with those for the M977 HEMTT.

Power will be applied to the tracks through the same transmission that has been combat-proven in the Bradley Fighting Vehicle. The AGS will



AGS autoloader magazine is replenished through a port in the turret, above. Gunner's computer keeps inventory, indexes proper rounds at gunner's command. At right, the powerpack is on a tray that slides out the rear, allowing quick and easy inspection and repair.



have a governor-limited top speed of 45 miles per hour and the ability to accelerate to 20 miles per hour from a standing start in six seconds. With its 150-gallon fuel capacity, the AGS is projected to have a 300-mile cruising range. Its low ground pressure of 8.7 pounds per square inch, coupled with its high horsepower/weight ratio, should give it unparalleled battlefield mobility.

An important design feature is the ease of maintenance on the powerpack. Mounted on two tracks, the pack slides out for maintenance within five minutes, and can be run while it sits on the tracks at the rear of the vehicle. It can be reinstalled in another five minutes.

Armor protection for the AGS crew is passive and modular. Additional modules can be added to the base vehicle to tailor protection to the scenario; the base vehicle weight of 37,300 pounds when fully combat loaded increases to 49,500 pounds with the addition of the maximum "Level 3" armor. The armor is not intended to defeat tank main gun rounds, but will use spaced armor and other advanced design concepts to maximize crew protection against small arms, indirect fire, and advanced antitank missile fire. In the lightweight "Level 1" configuration,

the AGS can be deployed by low velocity air drop from a C-130 or roll-on/roll-off from the C-130.

The AGS driver sits in the middle of the hull in a position similar to that occupied by the M1 driver. He will be seated in a reclining seat and use controls very similar to those that control the M1.

Conclusion

The Close Combat Vehicle Light is the prototype for the Armored Gun System; the Office of the TRADOC System Manager for the Armored Gun System emphasized that changes in the AGS will almost certainly be made during the move to full production status. A total of 300 vehicles is planned. Low-rate initial production of 69 vehicles is scheduled to begin in September 1994, and full rate production will follow with the remaining 231 vehicles.

The Armored Gun System will provide the Army with a rapidly deployable vehicle with the firepower, armor protection, and battlefield mobility which U.S. light and contingency forces will need to fight and win on the battlefields of the 21st Century. Iraq's invasion of Kuwait two years ago proved that the end of the Cold War has not eliminated the threats to

American national interests worldwide. With the addition of the Armored Gun System, the Army increases its ability to respond rapidly to the threats it may be forced to counter at any time, anywhere in the world. The soldiers of the U.S. Army Armored Force — and the security of the nation — deserve nothing less.

The author would like to express his appreciation to FMC Corporation and the Office of the TRADOC System Manager for the Armored Gun System for their assistance in preparing this article.

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Commander's Intent: Uniformly Known and Misunderstood

by Major Calvin R. Sayles

In the July-August 1990 issue of *ARMOR*, an article appeared named, "The Abuse of Paragraph 3a, or What Commander's Concept is Not." I read the article many times over the last year, often frustrated by it, several times beginning but never finishing a response. It seemed to me that if anyone were able to outline the framework for commander's intent, it would be an S3 observer/controller at the National Training Center. Why, then, was Major Stephenson, whom I personally know to be a superb officer, unable to outline what commander's intent is in a five-page article.

Over two of the last three years, I have been a small group instructor responsible for teaching company through brigade tactics. During this time, I received three memorandums, three messages from Fort Leavenworth, and five articles defining commander's intent. All had things in common, but all were different to a significant extent. This made teaching a difficult proposition. Additionally, I have been part of several video teleconferences with other TRADOC branch schools. As with the memorandums and messages, each school had significant differences in what commander's intent is. Does intent equal purpose? At battalion and below, is there a formal Commander's Intent paragraph, or is it integrated in the Concept of the Operation? Is Commander's Intent part of paragraph 3a or is it a "floating paragraph" between 3 and 3a? In the Estimate of the Situation process, Course of Action Development, is there one intent for each course of action, or is the intent the same for all possible courses of action?

Only last week, I participated in the preparation for a General Officer Workshop. One of the topics of the workshop was future Army doctrine, specifically, AirLand Operations. To facilitate discussion, a scenario was provided for working groups to develop courses of action. Each course of action was to include commander's intent and a concept of the operation. As the staff began to work, one of the first issues on the informal agenda was what format should be used for the intent and concept paragraphs. Members of this staff were some of the finest minds and most experienced officers I have worked with, former brigade and battalion commanders, battalion S3s and observer/controllers, and yet we had to determine and continually review what our format would be.

Considering all of this, it's no wonder that Major Stephenson, the author of the above-mentioned article, had difficulty defining commander's intent.

One might ask, is this really an important issue, or is it something that TRADOC schools just enjoy pondering. It would appear that even without an Army wide understanding of intent, we have been very successful in several of our last operations. Even so, having a common understanding of intent is important for several reasons.

First and foremost, if mission orders and mission oriented command and control are truly the heart of our AirLand Battle Doctrine, then understanding the commander's intent is crucial. If the purpose the commander gives a subordinate is truly more important than the task, then the intent (the method the commander uses to begin to articulate his purpose), must be understood clearly. If we are to take advantage of the often mentioned initiative of the American soldier, then every soldier must understand that initiative should only be taken within the commander's clearly articulated intent.

Second, although we have been successful recently, there are realistically potential future battlefields that may test our doctrine much more than recent operations. Low-intensity conflict describes a battlefield on which mission oriented command and control will be a cornerstone to successful operations. Additionally, it appears that our future doctrine, AirLand Operations with its emphasis on the offense, and dispersed wide ranging operations, will rely even more heavily on understanding the commander's intent.

Finally, quoting from FM 100-5, "...to be useful, doctrine must be uniformly known and understood." I believe that commander's intent, a doctrinal issue as identified in FM 100-5 and FM 101-5, is not uniformly understood and therefore not as useful to us as it might be.

At this point you may be asking yourself, "Is commander's intent not uniformly understood, or is it rather that the author just doesn't understand?" This is a fair question. In an attempt to provide a fair answer, I have compiled some objective statistics that support my position.

I am currently serving as one of the three team chiefs for the Infantry Officers Advanced Course. My team recently started a new class of 165 students, 129 of which were U.S., both Active and Reserve Component. I asked all 11 of my small groups instructors to give a quiz to the IOAC students, before their first major block of tac-

tics instruction. I asked them to use it as a way of introducing concepts and encouraging discussion. Below is the quiz that I provided. The number of people that responded to each possible answer is noted in parenthesis at the right of each answer. Questions specifically about commander's intent are 3 through 6, but go ahead and read all of the questions, because they will also be discussed.

Quiz For IOAC

Do not place your name on this document. Complete the following eight questions, and turn it in to your SGI. If you do not know an answer, do not guess. A response has been provided if you are unfamiliar with that specific question. Remember, this is an ungraded quiz to be used for discussion purposes. The results, in general, will be discussed with you at a later time.

1. Many of our doctrinal and tactical manuals use the term, MAIN EFFORT. A MAIN EFFORT:

- a. Is usually a company for a task force. (11)
- b. Is the same as MAIN ATTACK. (21)
- c. Is a mission-essential task to be accomplished at a certain time and location. (24)
- d. Changes as the battle develops, wherever the commander's focus is. (63)
- e. I do not know. (10)

2. In the Estimate of the Situation Process, during Course of Action, (COA) development, a DECISIVE POINT will often be identified and become the heart of a single COA. A DECISIVE POINT is:

- a. The same as Main Effort. (15)
- b. A location on the ground. (45)
- c. An enemy vulnerability. (48)
- d. An enemy unit. (0)
- e. I do not know. (21)

3. As part of the Operations Order format, COMMANDER'S INTENT is optional at battalion level and below.

- a. True (8)
- b. False (114)
- c. I do not know. (7)

4. As part of the Operations Order format, brigade and higher, COMMANDER'S INTENT is:

- a. Located in paragraph 3a, Concept of the Operation. (66)
- b. A floating paragraph between paragraph 3 and 3a. (34)
- c. Given verbally by the commander before the OPORD to provide a framework for the operation. (10)
- d. Given verbally at the end of the OPORD to identify critical tasks.
- e. I do not know (17)

5. COMMANDER'S INTENT should include:

- a. Significant factors and critical tasks in relationship to mission accomplishment, i.e. speed, surprise, etc. (40)
- b. Purpose of the operation, end state of enemy/friendly forces and terrain, and how this will be achieved. (80)
- c. Motivational comments to inspire subordinates. (0)

- d. Clarification of specific points not previously mentioned in the order. (5)
- e. I do not know. (4)

6. Paragraph 3a, Concept of the Operation should include:

- a. A description, in general terms, of how the operation will be conducted from beginning to end. (68)
- b. Expansion of the purpose, generic task organization, and arrayal of forces. (5)
- c. A description of the flow of the battle to include significant factors in relationship to mission accomplishment, i.e. speed, surprise, etc. (43)
- d. An expansion of the Commander's Intent. (5)
- e. I do not know. (8)

7. An example of a good MISSION STATEMENT is:

- a. B Company defends in sector, NLT 0600 11 March 92, to deny penetration of PL Blue. (21)
- b. B Company denies penetration of PL Blue in sector, NLT 0600 11 March 92, to prevent the envelopment of D Company. (20)
- c. B Company occupies BP 10 NLT, 0600 11 March 92 and defends in sector to deny penetration of PL Blue. Be prepared to conduct counterattack to complete the destruction of enemy forces vicinity OBJ RED. (42)
- d. All examples are acceptable mission statements. (46)
- e. I do not know. (0)

8. How do you identify the Mission Essential Task(s) for your mission statement?

- a. From your Mission Essential Task List (METL). (34)
- b. From the Estimate of the Situation process, Mission Analysis. (88)
- c. I do not know. (7)

Note that there is not an overwhelming majority of responses to any question. Even more pertinent is that five of the eight questions were answered incorrectly, (arguably,) by the majority of students. Specifically, questions 1, 3, 4, 6, and 7.

Two objections might be raised in regard to this quiz. First, the quiz itself might be biased, to which I would respond, it may be. Although I have not tried to trick the students, and offered only possible answers from responses that I have heard over the last several years, I realize this may not be a statistically verifiable test. Even so, I believe it does provide at least an indication of where we stand.

Second, some might say that junior officers aren't suppose to be doctrinal experts. Again, there may be some truth to this, but these company grade officers are reflections of their experience, specifically the company and battalion commanders they have worked for.

So where is the answer key? At this point, the answers aren't important. What is important is that you can see we have a wide variety of opinions about some basic doctrinal concepts.

Up to now, I haven't given you anything more than Major Stephenson did in his article. My hope is, at this

point, that you would agree that there is a problem and that it is significant.

So what is commander's intent? I will offer you an opinion, and then explain afterward why it's not worth much. I believe that the commander's intent is the pivotal point in the operations order where the commander continues, in some detail, to explain the purpose of the operation. He is telling his subordinates why the mission essential task is important. He is not explaining the purpose to convince his subordinates, but rather to ensure, if it becomes necessary, they can take initiative within the commander's purpose. If a subordinate finds himself in a difficult situation, unable to communicate with his commander, he should be able to recall the commander's intent and answer the question, "What would my boss have me do if he was here?"

I mentioned earlier that the commander continues to expand on his purpose. He begins in his Mission Statement, where he also articulates his purpose or the 5th "W"; why. In the Mission Statement it's not enough to say "DEFEND in order to DESTROY." Rather it should be, "DESTROY in order to PREVENT THE BYPASS OF THE MAIN EFFORT." This tells a subordinate that defending a battle position is meaningless as opposed to preventing the bypass of the main effort. Therefore, if the situation changes and the subordinate can't contact his higher, he can act independently, within the commander's intent, and do whatever is necessary to accomplish the purpose. That might include moving a battle position, or even conducting a limited counterattack.

Similarly, the higher's purpose should tie directly into his higher's purpose, as stated in paragraph 1b. (1), Friendly Forces, Higher Unit. This is a tool that ensures all units are synchronized.

So, to be concise, the commander's intent is stated immediately preceding paragraph 3a. It is the commander's stated vision which defines the purpose of the operation, (why), the end state with respect to the relationship among the force, the enemy, and the terrain. The intent statement is included only if the commander believed it necessary to expand on the purpose of the mission statement or higher's intent in paragraph 1b. At battalion level and below, the commander's intent may be the same as the purpose of the mission statement. If so, it is not necessary to restate it. This definition is a compilation of directives, definitions from manuals, and much discussion within the seminar room and is used in the IOAC. There is one significant problem with this definition.

Although generally accepted by the people with whom I work, it may differ from the Armor School's definition, which may differ from the Field Artillery School's definition, etc. Individual TRADOC schools cannot write doctrinal definitions. If we do, we will probably never have a doctrine that is "uniformly known and understood." Individual schools can certainly write tactics, techniques,

and procedures, but Fort Leavenworth must be the source that articulates doctrinal issues. Fort Leavenworth's answer to many questions appears to be ST 100-9, which supposedly clarifies many issues and discusses, "emerging doctrine." In my discussions with many other TRADOC schools I have learned that ST 100-9 is the basis of much instruction and is even issued as part of their student book issue. But, in my opinion, a student text infiltrated throughout the Army, does not replace a doctrinal manual. Is commander's intent that big of an issue? In the grand scheme of things, probably not. Commanders, one way or another, seem to be communicating effectively to their subordinates. Although, the issue of commander's intent identifies the tip of a much larger iceberg. That is, there are many areas within the estimate process and the operations order format that are unclear.

How does the average commander identify a decisive point, and from that build a course of action?

What is a main effort? Is it a unit, or does it identify the task that will be accomplished at the decisive point at a specific time?

Is there a relationship between a mission essential task identified during mission analysis and the METL?

What should be included in the Concept of the Operation? Should it describe the operation from LD through reconstitution, or should the commander only explain in general terms how the mission will be accomplished?

I can't give you a definitive answer on any of these questions, only a school position. I think that's why I have been so frustrated after reading and rereading Major Stephenson's article. I personally believe that instructors, students, observer/controllers, and the entire Army require and deserve a common doctrinal lexicon, specifically a FM 101-5 and 101-5-1 that answer these questions. What they don't deserve are recently published tactical manuals that are inconsistent with each other because our doctrinal manuals are sometimes vague. Additionally, I can say with some confidence, the clarity required in the estimate process and operations order format will be even more important if we transition into AirLand Operations. If we do make the transition, it would appear to be the perfect time for Fort Leavenworth to answer many difficult and challenging questions.

Major Calvin R. Sayles was commissioned in Armor in 1980 from the University of Southern Colorado. He served as a tank platoon leader in 2-68 Armor, Baumholder, Germany, and as company commander of D Company, 5-73 Armor, Ft. Knox, Ky. He is currently serving as a team chief for the Infantry Officer Advanced Course at Ft. Benning, Ga. He is a graduate of the Armor Officer Basic and Advanced Courses and CAS³. He is currently attending Command and General Staff College.



He fought in France, Greece, Russia, and again in France during the defense of Normandy, when his Tiger tank — already displaying 100 kill rings on the barrel — knocked out another 21 British tanks in a single action. He was the most successful tank commander in World War II.

Michael Wittmann

by Dr. Greg Jones

I saw him for the first time in the park at Baron in Normandy. He ran through the rain with hunched shoulders and hands in his pockets because it was cool and perhaps he was cold. Two hours of sleep on a field bed somewhere were not sufficient to remove the shadows of exhaustion and of difficult battle from his face. He stood before us of middle height, his hair pale blond, a face in which modesty, calm and self-assurance could be read.¹

This is how a German war correspondent described his first meeting, in 1944, with the most successful tank commander of World War II, Waffen-SS Hauptsturmführer (Captain) Mi-

chael Wittmann. Shortly before the interview had taken place, Wittmann's Tiger tank had destroyed almost an entire British armored brigade in one of the most spectacular feats of combat arms of World War II. However, 1944 marked the tenth year of Michael Wittmann's military career and his recent success in Normandy had been preceded by other remarkable accomplishments.

Michael Wittmann was born the son of farm folk in Vogelthal, in the Oberpfalz region of Germany, on April 22, 1914. After completing his secondary school finals, he remained on the farm, working with his father until 1934. Then, at the age of twenty, he volunteered for the German Labor

Service — a year before the six-month stint of labor was declared mandatory.² After his duty obligation expired, he went into the Reichswehr as a member of the 10th Battalion of Infantry Regiment 19 at Freising, where he rose to the rank of corporal.³ Farmers' sons were a group whose recruitment into the SS was actively encouraged by Heinrich Himmler, who was notorious for his quaint, rustic ideas⁴ — and Wittmann, after his release from Army service, applied to join the SS in SS-Sturm 1/92 at Ingolstadt on 1 November 1936. After only five months with the Allgemeine SS, Wittmann came into the 17th Company of the Leibstandarte Adolf Hitler — Hitler's personal "Guard



Wittmann, at left, with Baltasar Woll, the gunner on his Tiger tank, in Belgium during the spring of 1944.

Regiment” — on April 5, 1937. Although the Leibstandarte was technically a component of the SS, *“The men who had joined it had done so for the purpose of leading lives as soldiers, albeit soldiers who were attracted by the unique status conferred by membership in that company. Exhortations of devotion to Hitler, which had to be rather abstract to an SS unit in Munich, could be taken literally in the Leibstandarte. Efforts at ideological indoctrination were often self-defeating in the context of the Leibstandarte’s ‘raison d’etre’.”*⁵

Indeed, Wittmann was never a member of the National Socialist Workers party (Nazi),⁶ which was not uncommon in the Leibstandarte.⁷ Between the time of Wittmann’s entry into the Leibstandarte and the start of World War II, the Leibstandarte settled into an “essentially passive routine.”⁸ The 17th Company, to which Wittmann belonged, would alternate between tours of watch at the Reich Chancellery in Berlin and Hitler’s Obersalzberg retreat, although the Leibstandarte as a whole found permanent residence at the Lichterfelde complex outside of Berlin.

By the time war broke out in September of 1939, Wittmann had attained the NCO rank of *unterscharführer* (sergeant) in the infantry branch. “Although he knew his infan-

try weapons ‘in his sleep,’ it was love at first sight between him and the panzers.”⁹ Following the fall of France in 1940, the Leibstandarte received its first allotment of *Sturmgeschütz* — turretless assault guns — with Wittmann gaining his first experience as “*Geschützführer*” during the German invasion of Greece. Shortly after the German invasion of the Soviet Union in the pre-dawn hours of June 22, 1941, Wittmann earned his first decorations, winning an Iron Cross 2nd Class on July 12, 1941, and the Iron Cross 1st Class on September 8.¹⁰ In Russia, as a member of the

Leibstandarte’s Third *Sturmgeschütz* Batterie, Wittmann came under the tutelage of *Sturmbannführer* (Colonel) Max Wünsche, Hitler’s former adjutant.¹¹ An early indication of Wittmann’s skill as an individual vehicle commander came when he repelled the assault of 18 Soviet tanks by knocking out eight of them.¹² A former member of the *Sturmgeschütz* battery recalls, “Although our company commander from back then was fond of saying that we had ‘many Wittmanns’ in the detachment, the fact that he, the company commander, recommended him for Officer’s Candidate School (*Junkerschule*) was special recognition for Michael Wittmann. He stood out from the others.”¹³

In June 1942, Wittmann was assigned to the SS Officer’s Training School at Bad Tolz, eventually attaining his officer’s commission with the rank of “*untersturmführer*” (first lieutenant) on December 12, 1942.¹⁴ “*Seine Wunsche ist immer noch, einmal einen schwerin Panzer zu fuhren*” — his wish was always the same — he wanted to command a Tiger tank,¹⁵ the new “superweapon” of the war, and with the Leibstandarte having been granted its own company of Tiger tanks in November of 1942,¹⁶ Wittmann’s wish was granted. He first

climbed into a Tiger tank as an officer with the Tiger Replacement Battalion (*Schwere Panzer Ersatz Abteilung*) of the Leibstandarte and was issued a booklet called the “*Tigerfibel*” or “*Tiger Primer*.”¹⁷ The primer stated the duties of each member of a Tiger crew — commander, gunner, loader, driver and radio operator. For the commander, it detailed sequences of command as well as reminding him, “Your quick thinking, your certain commands, brings the tank to life.” Your rapid directions in selecting the warhead (armor piercing, high explosive, etc.) has a decisive effect. YOU hold all the trump cards in your hand.”¹⁸ But Wittmann brought to Tiger tank command something that the *Tigerfibel*, with all its pithy sayings, could not. He possessed a very real hunting instinct — “*Jaegerinstinkt*” — that would make him the great tank killer of World War II.¹⁹

By March 1943, he saw combat in the turret of a Tiger tank as part of the German operation to close the 300-kilometer gap that resulted from the defeat at Stalingrad. The goal was to capture the city of Kharkov. The Heavy Tank Company of the Leibstandarte reached the western fringes of the city on March 8. Wittmann, however, was not “in on” the successful capture of the city — attrition had deprived the Leibstandarte of all battleworthy Tigers, leaving its divisional commander some 14 lesser tanks with which to take the city.²¹ Ironically, the first Germans into Kharkov’s “Red Square” turned out to be from the Leibstandarte’s Third *Sturmgeschütz* Batterie, Wittmann’s old outfit!²⁰

The capture of Kharkov, in turn, left a tempting bulge of men and materiel centered on the Ukrainian city of Kursk, and on July 5, 1943, the Tiger company was subordinated to the Leibstandarte’s Second *Panzergranadier* Regiment during its northward drive toward Kursk.²² Michael Wittman’s Tiger knocked out eight Soviet tanks and seven antitank guns (PAK) on the first day of what was to

evolve into the largest tank battle of World War II.

Wittmann was fond of telling his fellow tank commanders that he felt more accomplishment in knocking out an antitank gun than in knocking out an enemy tank, "the antitank gun is harder to spot than the tank; it's able to get off more rounds before [I] can find it."²³

There was ample opportunity to test his theory at Kursk, where his Tiger crawled through miles of antitank gun fronts and hull-down Soviet tanks. Michael Wittmann and his crew lasted through five days of fiery combat, due in part to the superior firepower and protection given them by their Tiger tank. Many other Tiger crews, though, met their end at Kursk — Wittmann, it seems, had on his side, besides bravery, "the luck that often accompanies the man who masters his craft." Emerging from the turret of his tank — his face smeared with perspiration and blackened with gunpowder soot — Wittmann had the satisfaction of knowing that his Tiger had destroyed in its wake 28 tanks and 36 of the antitank guns he so hated.²⁴ In spite of individual local successes such as Wittmann's, the great German offensive at Kursk failed, and the Leibstandarte was shipped off to Italy for a respite from the fighting, its heavy equipment remaining behind in Russia.²⁵

Upon its return to Russia in November of 1943, it was forced to adopt a new role — that of grisly rearguard on a front experiencing "catastrophic deterioration."²⁶ Wittmann, along with the rest of the heavy company, became part of a force intent on the capture of Brussilov, a city deep within a salient jutting out from Kiev. On November 13th, his Tiger tank was involved in what was described as "feverish" action, knocking out ten Russian T-34s and five PAK by noon and another ten tanks and seven PAK by evening.²⁷ There were targets aplenty.

Despite an impressive tally of destroyed enemy tanks, 56 from July 1943 to 7 January 1944,²⁸ it took a

breakthrough by Soviet armor and Wittmann's success in dealing with it to finally earn him recommendation for Germany's highest military award, the "Ritterkreuz" or "Knight's Cross."²⁹ Wittmann's Tiger destroyed three T-34s and one assault gun on the 8th and another six on the 9th, while the platoon under his command halted the breakthrough.³⁰ There was, however, little time to savor the Knight's Cross recommendation. By January 13, he had destroyed his 88th enemy tank,³¹ stopping yet another Soviet deep penetration, but this time he did not come away unscathed — he suffered broken teeth on the inside edge of his tank's turret.³² The dental prosthesis that replaced those lost teeth was instrumental in identifying Michael Wittmann's remains some forty years later.³³

At ceremonies held on a snowy overcast day on January 14, 1944, the Knight's Cross was presented to Michael Wittmann by his division commander, Theodore Wisch, along with the hearty congratulations of the Panzer Regiment Commander, Jochen Peiper. Displayed prominently in all photos taken of the occasion is his Tiger tank, its gun barrel painted with alternating black and white rings to indicate his 88 kills. Also receiving the Knight's Cross that day was his trusty gunner, Baltasar Woll, in recognition of the important role he played in Wittmann's success.³⁴

The more Soviet tanks that poured into the domain of Wittmann's Tiger, the higher his victory total went. And Soviet armor continued to pour in. By the end of January, Wittmann had destroyed over 100 enemy tanks during his time on the Eastern front.³⁵ On January 30, he received the following telegram:

*In gratitude for your heroic action in the battle for the future of our people, I award you the Oak Leaves to the Knight's Cross of the Iron Cross as the 380th soldier of the German Armed Forces.*³⁶ — Adolf Hitler

The press release that accompanied the announcement of the Oak Leaves

attributed Wittmann's "magnificent performance" to his "aggressively offensive stance and praiseworthy shooting abilities."³⁷ On February 17, after assuming temporary command of the entire heavy tank company,³⁸ Wittmann's Tigers slogged through the mud of southern Russia to aid in cracking the Soviet ring around Tscherkassy and help free some 35,000 trapped men, while accounting for an additional nine tanks of the Soviet 5th Guards Tank Corps.³⁹

While the Leibstandarte refitted in Belgium after almost five months of continuous combat in Russia, Wittmann, accompanied by Woll, received an audience with Hitler at Fuhrer Headquarters, where he formally received his Oak Leaves to the Knight's Cross.⁴⁰ Also present were Wittmann's former commander with the assault gun unit, Max Wunsche, along with the commander of the newly-formed Heavy SS Tank Detachment 101, with which Wittmann would serve as company commander.

Come June 6, 1944, the SS 101 found itself far away from the beaches of Normandy in the Beauvais area of northern France. It finally reached the battle zone on the night of June 12/13.⁴¹

The day of the 13th, "A" and "B" Squadrons of the British 22nd Armor Brigade were surreptitiously advancing towards the city of Caen in hopes of "turning" the left flank of the German Panzer Lehr Division.⁴² Wittmann intercepted the column at the town of Villers-Bocage, knocking out four Cromwell tanks of the trailing "B" Squadron in the town proper. Changing direction, he turned his attention to "A" Squadron, which he caught unawares on narrow roadway bordered on each side by "bocage" embankment. Methodically, he put a stranglehold on the long column, first by setting ablaze its lead vehicle, a halftrack, to block escape from the front, and then by stationing his Tiger near the back of the column to prevent escape from the rear. Wittmann then patiently shot up the column,

first the tanks, Cromwells, and Fireflies, then halftracks, then lorries.⁴³ By destroying the column, he not only secured the flank of Panzer Lehr — but also, “by his immediate decision, carried out with the greatest valor, averted a critical danger to the whole of the I. SS Panzer Korps, as at that time, the Korps had no other reserves available.”⁴⁴

Wittmann received his “Swords to the Oak Leaves” to the Knight’s Cross from Sepp Dietrich, commander of the SS Panzer Korps, and in an effort to recognize and publicize Wittmann’s achievements, a correspondent from *Das Schwarze-korps* — the newspaper of the Waffen SS — went to interview Wittmann:

Just hours before, Wittmann had destroyed 21 British tanks, and the most unusual thing to observe about him was that curious after-effect of great exertion, which had left not only a physical effect upon him, but also upon his heart and soul. He knows completely what he has accomplished, he knows the value of his success. Yet anyone who talks to him as a “hero” will experience that Michael Wittmann looks at him quiet and convinced with some degree of confusion and then with — rejection. He doesn’t like the dramatic, the “big words” and the fuss people make about him. He doesn’t know what to do with such people and he will walk away!

It will be unforgettable for me to have heard him relate how he stood alone with his single tank in the cover of the forest and had the marvelous view of a passing British tank regiment. When he spoke his words they were carefully weighed and it appeared he was very anxious not to commit any mistake, but to describe an event with the greatest degree of truth or factuality as possible. Vehicle behind vehicle, sixty enemy tanks in



SS leader Jochen Peiper congratulates Wittmann and his crew at Wittmann’s Knight’s Cross ceremony, January 1944.

rapid movement along a road barely twenty meters away. There stood Michael Wittmann. Great odds had not intimidated him before, but this was suicide. Who had ever attacked a whole regiment before? Should he attack?

I couldn’t do anything else, Wittmann said in a very unheroic way, very simple...Wittmann didn’t have to stop and think out what to do. He had a ‘sixth sense’ in assessing a situation, which gave a unique gift to his method of fighting. But he also knows what his success had cost him in terms of spiritual strength and the totality of the situation, which placed him under the shadow of death and in the midst of great efforts. All this changes people, creates different standards. Too much hinges on this performance for one to act like a hero out of a storybook. The mood which enclosed the combat sphere of the Tiger tank with a commander like Wittmann aboard included cold bloodedness and presence of mind, complete mastery of all means of war. His marvelous victories are not the

victory of the “heroic,” but of the “human.”

With him, and all others on whom the battle hinges, were not made by nature without nerves or feelings. They are not “Supermen.” They are human beings, with wishes, longings, hopes and thoroughly bourgeois love for their wives and children.⁴⁵

Almost half a century later, Herbert Reinecker, the SS war correspondent who conducted the interview, recalled:

“Physically, Wittmann did not fit the description one usually visualizes for that of a “hero.” He appeared pale and to be slight of build. He had a serious demeanor, and there was little euphoria after his great victory. I

found him to be very modest and quite unpretentious; in fact, I developed a strong feeling of sympathy for him. I sensed he was prepared for sacrifice, even self-sacrifice if necessary, and to me, he gave a whole new meaning to the word “hero.”⁴⁶

On August 7, 1944, Field Marshal Montgomery made another attempt to link up with American forces at Falaise by advancing southward along the Caen-Falaise Road. Standing in the way of an estimated 600 Allied tanks was an armored battle group of 60 German tanks, including Wittmann and 10 Tigers from his Company Two. The Allied advance was preceded by massive bombing raids,⁴⁷ and Wittmann, who had no intention of sitting back and being caught in a saturation bombing. Meanwhile, he was seeking open country to deal more effectively with the masses of Allied armor directly ahead of him. He led a column of four Tigers north along the Caen-Falaise Road and past the hamlet of Gaumesnil.

When Wittmann and his crew failed to return from their mission, search parties went out to attempt to search

the wreckage of three Tigers that had been reported destroyed east of Gaumesnil. The close presence of enemy troops prevented the search, and Michael Wittmann was officially listed as "missing in action" as of August 8.

Thirty-nine years later, an unmarked field grave was discovered near the site of the wrecked Tigers. After uniform remnants and dental records had helped to identify positively the remains as those of Wittmann and his crew, the remains were reinterred at the German Military Cemetery at La Cambe with full military honors.⁴⁹

Over the years, as in the case of Baron Von Richtofen, various national armies — including the British, the Poles, the Canadians — all claimed credit for ending Wittmann's life. Was his death the result of carpet bombing, or enemy tank fire, or perhaps a rocket fired from a fighter bomber? Baltasar Woll, his former gunner, was severely wounded in Normandy in an air raid, but did survive the war.⁵⁰

The announcement of the discovery of Wittmann's remains at Gaumesnil prompted an inquisitive veteran of the British 1st Northamptonshire Yeomanry, whose "A" Squadron had occupied an orchard just east of Gaumesnil on August 8, 1944, to examine War Diary Records stored at the Office of Public Records. There, he discovered entries for that August 8th which claimed the destruction of three Tiger Tanks by a single Yeomanry "Firefly" Sherman. The action had occurred in a field situated between Gaumesnil and the orchard. With the help of former officers and men from "A" Squadron, the veteran, Mr. Les Taylor, reconstructed the happening from that fateful day: "A" Squadron was concealed in the orchard at the time Wittmann's squad began to file forward in a northwesterly direction. The squadron leader called forward the only vehicle he had that could pose a serious threat to a Tiger Tank — the "Firefly" Sherman with its potent, high-velocity 17-pdr.

At a distance of 800 meters, and exhibiting marksmanship that Wittmann and Woll would have been proud of, the "Firefly" gunner shot up three of the Tigers, including Wittmann's. So ended the career of Germany's greatest tank hero.⁵¹

Shortly after the end of World War II, a senior commander of the Waffen-SS laconically commented that Adolf Hitler had "simply let his best soldiers just dash into the fire."⁵² One need look no further than the career of Michael Wittmann to appreciate the sad reality of that statement.

Notes

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³⁵Wittmann File, BDC Press Release Announcing Award of Oak Leaves to Knight's Cross to Michael Wittmann.

³⁶Wittmann File, BDC. Telegram Adolf Hitler to Michael Wittmann.

³⁷See 35.

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⁴⁶Der Freiwillige," Munin Osnabruck September 1991, p. 9. Interview with Herbert Reinecker.

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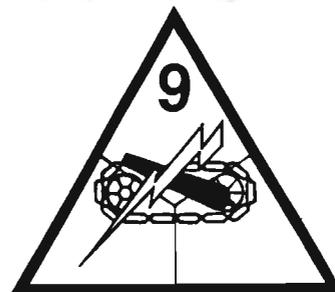
The author thanks Dr. Jim Weingartner and Mr. Bob Edwards, Captain, U.S. Army (Retired) for their tireless assistance in translation, and Jess Lukens for the use of photos from his great collection.



Halftrack rolls east toward Germany shortly after seizure of Remagen Bridge.

50th Anniversary - 9th Armored Division

9th AD History Forever Bound To Courageous Seizure Of Rhine Bridge at Remagen



The 9th Armored Division was activated at Fort Riley, Kansas in July of 1942, formed largely from the 2d Cavalry Division. Major General Geoffrey Keyes commanded the division during activation and the initial training period until he was sent to fight in the Tunisia campaign. Major General John W. Leonard assumed command on 25 September 1942, leading the 9th Armored in its fight across Europe, a campaign that made

it one of the most famous units of the United States Army.

The 9th Armored trained at Camp Ibis, California during the hot summer of 1943. Reorganized as a light armored division in October, and ordered to Camp Polk, Louisiana, the division earned an "excellent" rating for its participation in the Third Army maneuvers of early 1944. The 9th left the United States from Camp Kilmer, New Jersey, in August 1944, disembarking in Scotland and taking trains to Southern England. After crossing the English Channel, the division assembled on the Cherbourg peninsula by 10 October and convoyed across France to Luxembourg to assume the mission of VIII Corps reserve. General Leonard rotated his troops through positions held by elements of

the 2d, 8th, and 83d Infantry Divisions along the Siegfried Line to gain combat experience during November 1944. They got all of the combat experience they needed in December, when Field Marshal von Rundstedt aimed the strongest blow of the Germans' Ardennes Offensive at areas held by the 9th.

Each of the three combat commands of the 9th played decisive independent roles in winning the Battle of the Bulge. Combat Command A fought the Germans to a halt at the border between Luxembourg and Germany, in the vicinity of Beaufort, for ten days, then helped lift the siege of Bastogne after a 55-mile night road march. Combat Command B served proudly in the heroic defense of St. Vith, battling the 62d Volksgrenadier

World War II Campaigns

Rhineland

Ardennes-Alsace

Central Europe

Division and elements of the 1st SS Panzer Division. And Combat Command R distinguished itself in one of the toughest fights any element experienced during the Battle of the Bulge, delaying the German offensive for 36 to 48 critical hours east of Bastogne. This gave the infantrymen of the 101st Airborne Division time to prepare a successful defense. All three of the battalion commanders in Combat Command R were lost in this action, along with the majority of their staffs. The remnants of the Combat Command provided a mobile reserve, called Task Force SNAFU, during the siege of Bastogne, moving wherever the action was most intense and repelling the German advance until relieved by Combat Command A. Combat Command R was awarded a Presidential Unit Citation for its gallant fight at Bastogne.

After playing such a critical role in defeating the German Ardennes offensive, the 9th Armored Division rested and refitted in the area of Charleville, France, acting as SHAEF reserve. It continued to refit until 22 February, when it began a 200-mile road march from France through Belgium, where it was reassigned to the III Corps of the First Army.

On February 28, 1945, Combat Command B was the first element of the division to return to action, beginning an attack toward the Rhine, which was to bring the 9th Armored Division worldwide fame. Combat Command A took off from the Roer on the next day, with Combat Command R in reserve. The division advanced approximately 215 miles in

9th Armored Acclaimed For Coup That Won Bridgehead At Remagen

By Hal Boyle

On the Rhine, March 9—(AP)— With the exception of the great tank battle at El Alamein, probably no tank engagement in World War II will be remembered longer than the dashing coup which first put the American army across the Rhine at Remagen.
It was accomplished by the U. S. Ninth Armored Division.



News clippings give some sense of the public impact of the Remagen Bridge seizure. It is unusual and significant that the papers credited the division by name — often, an action was only vaguely credited to "units of Patton's Third Army" or "First U.S. Army troops."

the first week of March, and on March 6 was ready for the final plunge to the Rhine, regarded by the Allies as the most formidable obstacle to the defeat of Germany since Normandy. Thanks to the 9th Armored, it fell in minutes instead of months.

On the morning of March 7, Major General Leonard, the commander of the 9th, conferred with BG William Hoge, the commander of Combat Command B, and instructed him to establish a bridgehead on the east bank of the Rhine if the bridge at Remagen was found intact. These instructions were transmitted to Colonel Leonard Engeman, commander of the 14th Tank Battalion, which was then attacking Remagen. When Colonel

Engeman scaled a high hill overlooking the Rhine at Remagen, he saw German vehicles fleeing east across the bridge. He immediately sent a platoon of new M26 Pershing tanks under 1LT John Grimball, followed by infantry from the 27th Armored Infantry Battalion, to fight to the bridge. It was 1515. A prisoner of war taken in the fight for Remagen reported that the bridge was scheduled to be blown at 1600.

By the time the attackers reached the west end of the bridge, it was 1550. They knew that they had only ten minutes. Grimball's tanks provided overwatching fires as the men of Company A, 27th Infantry raced across the 1,200-foot span. German

World War II Commanders

MG Geoffrey Keyes
July 1942-October 1942

MG John W. Leonard
October 1942-October 1945

defenders command detonated two charges early; engineers from the 9th Armored Engineer Battalion raced onto the bridge to cut the wires connected to explosives underneath the bridge. Sergeant Eugene Dorland cut the main cable with three shots from his carbine, and Sergeant Alexander Drabik was the first man across the bridge. A Company, 27th Infantry consolidated its position on the far side of the bridge, soon joined by additional elements of the 9th Armored Division. Hitler's last great obstacle belt had been crossed.

It is nearly impossible to overstate the significance of the capture of the Remagen Bridge for the Allies. Hal Boyle, writing for the Associated



9th AD troops were among the first to use the M26 Pershing tank in combat.

Press, reported the triumph and estimated its value to the Allied cause: "It is no exaggeration to say that the speedy fording of the Rhine at a comparatively undefended point by tanks and infantrymen and engineers who knew there was strong likelihood the dynamite-laden bridge would blow up under them at any moment has saved the American nation 5,000 dead and 10,000 wounded."



A 9th AD dozer tank rolls through the Siegfried Line.

The Allied commanders would have been willing to pay that price to gain a foothold on the eastern banks of the Rhine in preparation for the final assault on the heart of Germany. The

valor of the 9th Armored meant that those lives were saved.

The importance of the Allied bridgehead at Remagen was immediately recognized by the Germans, who launched a determined attack to drop the span with artillery and air attacks immediately after it was seized. Hitler, in a furious rage at the capture of the bridge, reportedly tore the shoulder ornaments off of Field Marshal von Rundstedt, threw them in his face, and reduced him to the rank of private. But the bridge carried heavy military traffic for ten

days after its capture, during which time several pontoon bridges were built across the Rhine. By the time the Remagen Bridge collapsed because of the sheer weight of Allied armament which had passed over its span, the war in Europe was nearing an end. The bridgehead served as a springboard for attacks to the east and north that trapped over 300,000 German troops. Two months to the day after the capture of the Remagen Bridge, the war in Europe was over.

After crossing the Rhine, the 9th Armored raced to Limburg, where it discovered and freed thousands of Allied prisoners of war. The division then

became the spearhead of the First Army's thrust toward the advancing Russian armies. It surrounded Leipzig, assisting in the liberation of the city, and was finally assigned to the Sudentenland before being sent home and then inactivated on 13 October 1945. However, it is for its brilliant taking of the Remagen Bridgehead, even more than for its gallant actions in the Battle of the Bulge, that the 9th Armored Division will always be remembered. The *New York Sun* paid the heroic soldiers of the 9th a fitting tribute in March 1945 which still resounds today: "The men, who in the face of scattered fire and the great threat of the bridge blowing up under them, raced across and cut the wires have materially shortened a struggle in which every minute means lost lives. To all who utilized that ten minutes so advantageously goes the deepest gratitude this country can bestow."

This article was prepared by CPT John A. Nagl and the *Armor* staff from *History of the Ninth Armored Division* and *The Bridge*, two unit histories written by Captain Charles Gillett, public relations officer of the 9th Armored Division.



A self-propelled howitzer of the 10th AD crosses the Rhine near Manheim, 1944.

50th Anniversary - 10th Armored Division

10th AD Tigers Missed Credit For Valiant Fight at Bastogne

This July, the 10th Armored Division celebrates its 50th anniversary. The "Tigers" formed part of our rapidly expanding Armored Force in the early days of World War II, and played a crucial role in the defeat of Nazi Germany.

On 15 July 1942, the 10th Armored Division activated at Fort Benning, Georgia; the 2nd Armored Division provided equipment and training areas for the new division. Officers from

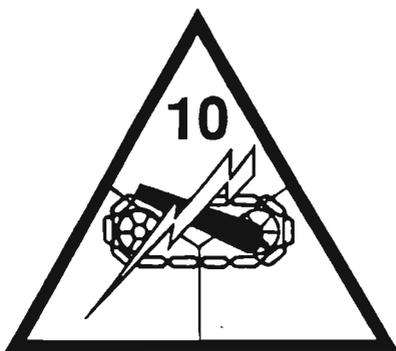
the 3rd and 11th Cavalry Regiments joined the original division cadre. Soon, men and equipment from across the United States arrived, and the new unit took shape. The transition from civilian to soldier went quickly. MG Paul Newgarden, the 10th's commander, explained: "If we are to be successful, we must work like hell, play like hell, and fight like hell." The 10th did just that.

Rugged training filled the first year as soldiers went through "Tiger Camp." After forced marches, endurance tests, night problems, dry runs, and firing problems, the 10th bloomed with "esprit de corps," and maneuvers in Tennessee demonstrated its prowess. Early in September 1943, the 10th relocated to Camp Gordon, Georgia. That fall, the 10th reorganized on a battalion basis. The hard training continued, but at the same time, the "Tiger" Special Service Office organized soldier shows, dances,

concerts, and a full range of athletic events.

Early on the morning of 15 July 1944, the 10th was saddened by the loss of MG Newgarden in a plane crash. MG William H. H. Morris, Jr. assumed command and stressed continued excellence in battle training. Then on 31 August 1944, the 10th entrained for Camp Shanks, New York, a port of embarkation just up the Hudson River from New York City. For two weeks, the "Tigers" made final preparation for overseas deployments.

On 13 September 1944, the division sailed from New York Harbor to an unknown destination. Unfortunately, the *U.S.S. Alexander*, with most of the men, ran aground in the Brooklyn Narrows, within sight of the city's



World War II Commanders

MG Paul W. Newgarden
July 1942-July 1944

MG William H.H. Morris, Jr.
July 1944-May 1945

MG Fay B. Prickett
May 1945-August 1945



A 10th AD M4 rolls past infantry entering Issel, Germany.

skyline. A squadron of hastily-assembled ferryboats spent a day transferring the soldiers to the *S.S. Brazil*, a converted luxury liner. With a destroyer escort, the *Brazil* set out to catch up to the convoy. After avoiding a fall hurricane, the *Brazil* joined the other ships on 16 September. Two days later, U-boats attacked and torpedoed a tanker in the convoy. Despite this, the 10th arrived at Cherbourg, France, on 23 September 1944, and was the first American armored division to disembark on French soil directly from America.

Immediately, the 10th was assigned to MG Walton Walker's XX Corps, part of LTG George S. Patton's Third Army. The "Tigers" spent a month receiving new equipment and training in the Normandy countryside. On 2 November 1944, the division received its baptism of fire at Mars La Tours, France. Late that month, the "Tigers" participated in the XX Corps capture of Metz. This action saw the construc-

tion of a 190-foot Bailey Bridge, the largest in the European Theatre of Operations. It was the first time in 1500 years that the ancient fortress at Metz fell. After fierce fighting, the 10th pierced the vaunted "Siegfried Line" and led the Third Army into Germany on 19 November 1944.

On 17 December 1944, the attack east came to an abrupt halt. In the north, the Germans had launched their Ardennes Offensive. The 10th was the first division to rush north against "the Bulge." Combat Command A moved 75 miles in a single day, directly into an attack. The 10th assumed responsibility to protect Luxembourg and the Third Army's right flank. Combat Command B was called to Bastogne by General George S. Patton on 17 December 1944. At that time, the 101st Airborne Division was resting and refitting in France; Combat Command B of the 10th Armored Division was the only combat unit defending in Bastogne at the time. The Tigers held Bastogne against eight German divisions until the 101st hurriedly returned, and then provided the infantry essential time to dig in before the city was completely encircled. Combat Command B remained with the airborne for the en-

tire fight at Bastogne. For the first time, combat commands of an armored division fought as part of two separate corps. The "Tigers" distinguished themselves with heroic efforts, both on the southern flank of "the Bulge" and at Bastogne.

In early February 1944, the 10th reassembled at Metz and rejoined the XX Corps. For security reasons, the "Tigers" stripped all identification from their vehicles and removed their shoulder patches. The division had a brief rest. A large number of "Tigers" were even able to visit Paris. Meanwhile, the division received needed, experienced replacements. Most of these new men came from the airborne and had recovered from combat wounds. They soon proved to be superb fighters.

The 94th Infantry Division had battered a hole into the Saar-Moselle Triangle. During the evening of 19 February 1944, the 10th raced 75 miles and passed through the infantry. At 0700 on the 20th, the "Tigers" attacked. In one day, they smashed the vaunted German defenses, and after 48 hours, the division had blitzed 85 miles, overrun the triangle, and reached the Saar River. Once the 94th had secured a bridgehead, the "Ti-

World War II Campaigns

Rhineland

Central Europe



Approaching the Neckar River near Untereichen.

gers" crossed the Saar and pressed on to capture Trier and a bridge across the Moselle River. The shocking loss of this heavily defended city caused German defenses to collapse. Generals Eisenhower and Patton personally visited the "Tigers" to congratulate them on this remarkable achievement.

Next, the 10th drove across the Palatinate. The hard-driving "Tigers" never allowed the enemy to reorganize his defenses. Skillful maneuver and exploitation into his rear forced repeated defeats on the enemy. In one week, the 10th advanced 100 miles and captured 8,000 prisoners from 26 different enemy divisions. This advance cut off the escape route of 50,000 Germans.

After a four-day respite, the 10th spearheaded General Alexander Patch's Seventh Army drive to Bavaria. The division raced through Kaiserslautern, crossed the Rhine River on 28 March 1945, and continued east. With rapid night movements, the "Tigers" continually surprised the Germans by appearing in different sectors. German dispatches referred to the 10th as the "Ghost Division." The division helped to seize Heilbronn, defended the Crailsheim Salient, and moved south to isolate Stuttgart. On 23 April 1945, the 10th crossed the

Danube River. Then on 27 April 1945, it led the Seventh Army into Austria. By the conclusion of hostilities on 9 May 1945, the "Tigers" had reached Mittenwald, Bavaria, where they halted, their mission accomplished.

The 10th occupied southern Bavaria until September 1945. On 3 October 1945, the division sailed from Marseilles, France. It arrived at Newport News, Virginia, on 13 October 1945, and was deactivated at Camp Patrick Henry, Virginia, on 15 October 1945. The "Tigers" had captured 650 towns and cities along with 56,000 German prisoners. Above all, the 10th had played key roles in several of the war's greatest battles, including Combat Command B's gallant defense of Bastogne. Years after the war, General Anthony McAuliffe praised the men of the Tiger Division, noting that, "In my opinion, Combat Command B of the 10th Armored Division never properly was credited



Near Saarbürg, cavalry of the 10th AD pass a knocked out PAK gun.



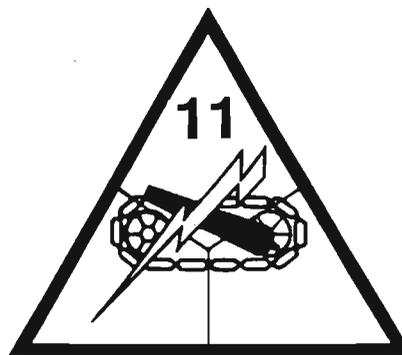
Banner on the ship going home tells 10th AD story in brief.

with their important role in the Bastogne battle."

The oversight has been righted. The division's proud history remains alive today with the 10th Armored Division Veterans Association.

This unit history was researched and prepared by Captain John Buckheit during his temporary assignment to *ARMOR* Magazine in Summer 1990 from unit histories including COL Lester Nichols' *Impact*.

11th AD Arrived in France, Then Raced to the Bulge To Tangle with Hitler's Best



The 11th Armored Division was created on August 15, 1942 at Camp Polk, Louisiana, at a time when Rommel's successes in the Middle East made it painfully obvious that more than the planned ten armored divisions would be needed to win the Second World War. The 11th Armored Division would play a critical role in making that goal a reality.

The first commander of the Thunderbolt Division was Brigadier General Edward H. Brooks, previously artillery commander of the Armored Force. The noncommissioned officers who provided the cadre for the fledgling division came from the Third, Seventh, and Eighth Armored Divisions. They went to work with a will, transforming green recruits — as many as a thousand arriving in one day — into a fighting unit. Basic training was brightened by the arrival of a group of Women's Auxiliary Army Corps soldiers in the spring of 1943, but the Division was soon engaged in the intense trainup called the Louisiana Maneuvers. It then moved to Camp Barkeley, near Abilene, Texas, in late summer 1943. There, the 11th was reconfigured as a light armored division, giving up the 41st and 42d Armored Regiments and the 55th Armored Infantry Regiment. The "Thunderbolt" moved in October to Camp Ibis, in the Mohave Desert,

for three months of training in difficult desert fighting. In January, the division moved to Camp Cooke, California, where the soldiers drew equipment left behind by the 6th Armored Division after its deployment to Europe. The "Thunderbolt" also bid farewell to its first commander as Brigadier General Brooks relinquished command to Brigadier General Charles S. Kilburn on March 8, 1944.

Training continued, refining the division's combat skills with lessons learned in fighting in the Pacific and Europe. The 11th received commendations from Army Chief of Staff George C. Marshall during a surprise inspection on May 2 as it honed its fighting edge. Finally, on the third of September 1944, the division's advance party departed for the European Theater aboard the British luxury liner *Queen Mary*, sharing passage (and enjoying luncheon) with Prime Minister Winston Churchill.

By September 10, the rest of the division had begun the long voyage from Camp Cooke through Camp Kilmer, N.J., to Cherbourg, France. The Division was diverted to England while afloat, having received word that the beaches at Cherbourg could not receive the heavy load of tanks and guns which the Eleventh was soon to put to use.

During the period from October 15 through the end of November, every member of the division was rotated through London for rest and recreation, providing a welcome respite from the training that continued as the 11th's equipment caught up with its soldiers.

By the beginning of December, every unit had fired its new weapons,

and the "Thunderbolt" began to move toward positions near Liege, Belgium. But even as the first LSTs touched France, and the 11th reoriented itself to a new mission to contain German forces in St. Nazaire and Lorient, rumors of a strong German counteroffensive on the Twelfth Army Group front reached all the way to England. The division gathered its equipment in Cherbourg and prepared for combat, awaiting instructions that arrived on 19 December assigning it to SHAEF reserve. Combat Command A began the 600-mile march toward Reims at dawn on the 20th; elements of the 11th disembarked from LSTs and moved directly into the long march. By the morning of December 28th, the last units of the "Thunderbolt Division" had arrived in the vicinity of Reims.

Just in time. At 2030 that evening, the division received orders to move to Bastogne, and by 0100 on the 29th, Combat Command A was moving. Midnight of the same day found the 11th Division closed 96 miles to the east at Neufchateau, despite a march depth in single column of more than 50 miles. The 575th Anti-Aircraft Artillery Battalion downed a Messerschmidt that attempted to attack the

World War II Campaigns

Rhineland

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World War II Commanders

MG Edward H. Brooks
August 1942 - March 1944

MG Charles S. Kilburn
March 1944 - March 1945

MG Holmes E. Dager
March 1945 - August 1945



division CP, then engaged in planning an attack at dawn the next morning to relieve the defenders of Bastogne.

The untested division would soon face the veterans of the 3d and 15th Panzer Grenadier Divisions, supported by the Reimer Brigade, a unit commanded by Hitler's former bodyguard. It was a daunting task.

Combat Command A passed through elements of the 6th Cavalry Group before jumping off at 0730; it made contact with the enemy south of Remagne, Belgium less than an hour

later. It was soon engaged in a slugfest over the woods surrounding Remagne. The infantry went to ground while the tanks fought from the best defilade positions they could find. Meanwhile, Combat Command B advanced along a separate axis toward Bastogne, making contact at 0930 north of Jodenville with the 15th Panzer Grenadier Division, itself attacking to sever the Bastogne-Neufchateau highway. Combat Command B refused to yield, and a dramatic struggle ensued. It became apparent

Tanks and trucks of the 11th AD ford the Muhl River near Neufelden, Austria, in May 1945.

(Photo loaned to *ARMOR* by Roy Buch)

that the two combat commands were too widely dispersed, and Combat Command A was ordered to break contact and join forces with the Reserve Command at the head of the Rechrival Valley. Through New Year's Eve and Day, the 11th continued to attack, joining forces with the 101st Airborne Division at Mande St. Etienne on January 2. It was relieved



Whitewashed in winter camouflage, a Sherman of the 11th AD's 42nd Tank Battalion, at left, is the first to move down Houffalize Road past a knocked out German tank.

Below, a column of German prisoners trudge through an Austrian village as an 11th AD Sherman rumbles through.

(Photo loaned to *ARMOR* by Roy Buch)



in place by the 17th Airborne Division on January 3, moving into Corps reserve. The "Thunderbolt" had played a significant role in stopping the Ardennes offensive, punching two veteran German Panzer divisions back six miles and safeguarding the essential Bastogne supply route in its first combat action.

After a week of refitting, battle began again on January 13. Under cover of the division artillery, which had been in action continuously since 30 December, Combat Command A moved toward Bertogne, taking the city that night as the rest of the division moved forward to share in the attack. Compogne fell on January 15, and on the 16th, the "Thunderbolt" linked up with First Army forces to the North near Houffalize.

It assumed a defensive posture as gains were consolidated, remaining in corps reserve with the mission of exploiting any penetration of the Siegfried Line. The attack on the line kicked off on 29 January; the 11th relieved elements of the 90th Infantry Division east of Grosskampenberg on February 5 in preparation for an at-

tack on Hill 568, an important defensive fortification two miles within the Siegfried Line. The hill was taken by 0830 on the 6th, but other objectives were not taken as swiftly, and again, the division assumed a defensive posture. On February 12, the division was shifted south to relieve the 6th Armored Division, and kicked off an attack through the dragon's teeth of the line on February 18, which completely penetrated the German defenses in the next four days. The "Thunderbolt," now rolling, couldn't be stopped.

The 11th reached the Rhine on 9 March and turned south in an advance which baffled the Germans. They took Worms on March 21 and Gelnhausen on the 31st. In Gelnhausen the division captured Private Hermann Sauermann, its 25,000th prisoner of war. The attack progressed with lightning speed, reaching Austria on April 26. When A Troop of the 41st Cavalry made contact with General Drichkin's 7th Parachute Guards at Amstetten, Austria, on May 8th at 1550 hours, the unit was the first element of Third Army to meet the Rus-

sians. The next day was Victory in Europe day. The 11th Armored Division had accomplished its mission.

During its four months and ten days in combat, the 11th Armored Division captured 76,229 prisoners of war during three major campaigns and hundreds of miles of combat. The "Thunderbolt" spearheaded the VII Corps attack to reduce the German advance into Belgium, breached the Siegfried Line, was the first western ally to enter Austria, and the first element of Third Army to make contact with the Russians. Like a thunderstorm, it was long in brewing but violent in execution. Its proud record is kept alive by the 11th Armored Division Association.

This article was prepared by CPT John A. Nagl during a temporary assignment to *ARMOR* Magazine from Lieutenant Colonel Hal D. Steward's *Thunderbolt* and Berry Craig's *11th Armored Division*, two works sponsored by the 11th Armored Division Association.



0200, Day 3 of a light/heavy rotation, Joint Readiness Training Center (JRTC), Fort Chaffee, Arkansas.

The platoon leader is taking his turn at radio watch and is counting down the days left in the rotation, when his radio comes alive.

"White Six, this is White Three."

"This is Six."

"Roger, Six, I've got five dismounts moving in the woodline."

"This is six, can you identify if they're friendly?"

"Negative, they've just disappeared into some dead space."

"Roger, Three, continue to scan that area while I check with higher to see if any friendlies are out there."

While talking to the team commander, the platoon leader observes several flashes out of the corner of his eye. He snaps around to look in the direction of the flash, and he sees the yellow light of his wingman's tank flashing. His next report to the team commander is about the loss of his wingman to an RPG team.

The preceding incident could happen to unprepared tankers on any day during a rotation to the JRTC. We can no longer focus all our combat train-

ing against heavy forces. We must be prepared to fight in a light environment.

The JRTC at Fort Chaffee provides the setting for tankers to test their skills against a primarily infantry threat. In addition, tankers get a chance to learn the complexities of integrating with our own light forces.

Recently, I had the opportunity to perform observer/controller (OC) duties during a light/heavy rotation at the JRTC. I was the OC for a tank platoon attached to a mechanized company team. The mech team was in turn attached to a regimental combat team (RCT). The experience led me to several observations concerning the JRTC in general, light/heavy integration, and basic tanker skills.

Training at the JRTC realistically replicates a low- to mid-intensity conflict. The first thing tankers must do in this type of environment is to rethink the threat. The threat is no longer a T72 at 3000 meters; now it may be an individual soldier at 50 meters. This requires constant vigilance and close integration with dismounted soldiers; it may, at times, require crew members to dismount and reconnoiter constricted terrain or to

use OPs to provide security, particularly at night. All of this requires the tanker to understand what kind of fight he is in and to break the habit of pulling into a position, turning on the thermals, and scanning deep for the enemy.

The tankers' first concern was whether the terrain at Fort Chaffee would allow and support the maneuver of M1 tanks. This concern was quickly put to rest. While the terrain would hamper a company trying to maneuver on line, platoons should not have a problem. The rolling, wooded terrain resembles parts of Germany, and the training area is approximately the same size as Hohenfels. The terrain is cut by numerous small streams, and the woods are impassable in places, but there are enough trails to permit freedom of movement.

The training area is divided by two man-made features that present possible problems. First is an underground, high-pressure pipeline that runs north-south through the training area. This pipeline can only be crossed at two points, making it a potential obstacle. The second is a hardball road that divides the training area in half. It is crossable at several points, but re-

quires particular caution because it is a major thoroughfare for the civilians living and working around Fort Smith.

Training at the JRTC is much like that at the National Training Center at Fort Irwin, California; it continues on a 24-hour basis, with the emphasis on hands-on performance, rather than simulation. There are three phases to the 10-day rotation at the JRTC: low-intensity conflict (LIC), mid-intensity conflict (MIC) defense, and MIC offense. The LIC represents the initial deployment and build-up of U.S. forces at the request of a friendly country. The MIC defense is the defense of the host nation against an invasion by enemy forces from a neighboring country. The MIC offense phase focuses offensive action taken to expel the hostile forces from the host nation.

It is during the LIC phase that tankers need to refocus their thinking. The mounted threat is nonexistent, except for any friendly vehicles the OPFOR may capture. However, the dismounted threat is significant, in capability if not in numbers. During this phase, the primary threats are three-to-five man teams that have been inserted into the area, snipers, and possible terrorist action. The OPFOR will also attempt to insert mortar and SA-7 teams.

During my OC stints, snipers accounted for four casualties to the tank platoon during the LIC phase. Several steps can diminish this threat. Ensure the vehicles are parked in well-camouflaged hide positions during daylight hours. Emplace OPs at a distance sufficient to provide observation and warning of approaching personnel. Find out if any dismounted troops are patrolling in your sector and coordinate with them; if not, request dismounts to patrol in the sector. As a last resort, conduct a limited reconnaissance with tank crews; this is preferable to sustaining casualties. Finally, do not allow crews to stand and congregate on top of their tanks.

It* quickly became apparent that OPs are critical during the LIC phase, especially at night. The OPFOR commander admitted that his personnel had no trouble penetrating the perimeter at night. I also observed that personnel walking within the perimeter were never challenged. This was a problem throughout the regiment. We have come to rely too much on our thermal sights. While these are a valuable asset, they are not without limitations. A properly placed OP can observe into dead space and provide sufficient warning to allow a unit to come to REDCON 1. He also must challenge personnel attempting to enter the perimeter, which is something mounted security cannot do without allowing the personnel to approach the vehicle and endangering the crew. OPs are essential, even if dismounts are provided for security. Besides being an additional security asset, they provide the dismounts with a direct commo link to the tanks. Without an external phone on the M1, the only way dismounts can communicate with a tank crew is by FM radio or by mounting the vehicle. The first method is not always secure, and the second is too slow.

For OPs to be effective, they must be properly sited, properly equipped, and they must fully understand their mission. But, more important, leaders must understand the effectiveness of OPs in a LIC environment and ensure they are emplaced to standard.

An aspect of the JRTC that will be new to tankers is the inclusion of "civilians." These are soldiers, male and female, in civilian dress who roam freely about the training area. They sometimes ride around in POVs. The civilians and their vehicles are outfitted with MILES equipment and are fully integrated in the exercise. They are initially neutral and, depending on their treatment, will remain that way or provide assistance.

The key is to understand fully that these people are part of the exercise,

and not ignore them. The primary challenge to tankers is to prevent these people from entering the perimeter without permission. This requires, if they are in a POV, that they be stopped 75-100 meters out. A guard must be placed along any tank trails and should be covered by a tank. The tank will provide backup in case the POV is hostile and drives past the OP. It can then be engaged and destroyed before it enters the perimeter. Civilians on foot should be treated exactly like other dismounts approaching the perimeter.

Casualty processing at the JRTC is very stringent. If the casualty evacuation and replacement system does not work, then the unit will not receive replacement personnel. The first sergeant must be pro-active and make the personnel system work. At one point, the platoon I was evaluating had four three-man crews.

Leaders are not immune to becoming casualties. They receive a casualty card in a sealed envelope, as do all personnel, and are assessed based on that card. Twice, the platoon lost key personnel to snipers. The first was a tank commander; the gunner did an outstanding job as acting tank commander. The second time, the platoon sergeant became a casualty, and the platoon continued to function with no appreciable degradation. The lesson is that all personnel must understand the mission and the commander's intent and be ready to execute the mission and to assume greater responsibility.

Vehicles are an area of special consideration. Every vehicle is issued a battle damage card that is assessed once the vehicle's MILES light goes off. The JRTC is attempting to enhance the system to assess quickly a damaged vehicle and return it to the fight if the damage is minor. The problem is to link up the vehicle with an OC to assess the damage as the battle continues. Tankers need to understand that, because not every hit at the JRTC is catastrophic, they should

be prepared to continue the fight once an OC has assessed their battle damage card. When a vehicle is assessed as damaged, it cannot be evacuated or repaired until the proper mechanics arrive with the right part and tools. Once a vehicle is evacuated to the UMCP, the vehicle then falls under the logistics OC's control. The JRTC may decide to go to all catastrophic kills at a later date; however, that is not the case at this time.

Vehicles and equipment may also be captured at the JRTC. Tankers need to be aware that BLUEFOR vehicles are not necessarily friendly. This goes back to security concerns, especially of challenging every vehicle entering the perimeter.

Any vehicle for which the OPFOR has a licensed operator is fair game. The OPFOR does not have the capability to drive M1s or M2s, but can operate any other vehicle a company team may possess. A vehicle can also be recaptured by friendly forces. If a vehicle is captured, the operator will remain with the vehicle and follow all instructions of the OPFOR. He is not a prisoner, and will be taken care of by the OPFOR. Sensitive items and personnel equipment such as TA 50 may not be captured. However, if the OPFOR happens to capture a KY 57, the JRTC OPs Group will bring out a KY 57 to give to the OPFOR to represent the captured KY 57. The OPFOR is also free to download the fills. Of course, all this applies to the BLUEFOR as well.

EPWs are handled very realistically. There are no free pockets at the JRTC. Every captured soldier is subjected to a thorough search. While EPWs are not bound in any way, they can be strip-searched down to undershirt and BDU pants. The lesson here is, don't become a POW.

The mounted OPFOR comes into play during the MIC phases. This force is as good as the OPFOR at the NTC. The MIC defense requires detailed planning and coordination with

the infantry to cover the avenues of approach. Do not assume terrain is NO-GO until you have walked it yourself. As at the NTC, the OPFOR knows its way around. The terrain allows reverse slope defenses with little or no digging. This will allow more engineer assets to help shape the engagement area. A three-tier fighting position is worthless if the enemy is not delayed in the engagement area. When on the offense, the opposite is true. Do not follow the obvious routes and do not get in a hurry. Take a little time to look for different routes; the OPFOR is human and most likely will expend its efforts on the obvious avenues of approach.

At present, there is no live-fire phase for armor vehicles. The JRTC Operations Group is looking into this and is planning to incorporate one in the future.

In giving my first impressions of the JRTC, I hope I've provided some insights and stimulated some thinking in units that will rotate there in the future. Tankers will find training at the JRTC very challenging. We rarely, if ever, get to train with light forces, especially in a LIC environment. The OPFOR is tough and professional; crews quickly learn they are not invincible.

Armor units training to go to the JRTC need to reexamine their training to ensure it includes tasks we do not perform often, such as OPs. Leaders need to understand what kind of battlefield they are going to and adjust their mindset. Finally, they must impress upon their soldiers that this is a new environment requiring different skills and techniques. Just because it worked in the desert doesn't mean it will work in Arkansas.

0200 Day 3 of a light/heavy rotation at the JRTC.

"White Six, this is OP One."

"This is Six."

"Roger, Six, I've got dismounts moving west to my front."

"This is Six, there are no friendlies operating in that area. Let me know if they head toward the dead space we reconned earlier."

"Roger, Six, I count five personnel, and they are definitely moving into that dead space."

"Roger, OP one, stand-by."

The platoon leader checks his map and notifies the team commander of the dismounts. The team commander acknowledges and tells the platoon leader that he will alert the ambush team that was inserted earlier. The platoon leader brings the platoon to REDCON 1 and gives the tank commanders a quick SITREP. Moments later, the woods 300 meters to his right front light up with muzzle flashes. Over the company net, he hears the ambush team leader's spot report: Engaged and destroyed one RPG team. As the platoon resumes its standard security measures, the platoon leader thinks to himself, "Seven more days."

Captain M. R. Pierce is a 1983 graduate of the University of Houston and received a RA commission in Armor. After completion of AOBC, he was assigned to 1-64 AR, 3ID, where he served as a tank platoon leader and company executive officer. Following AOAC, he served as an assistant S3, 1st Bde, 1st Cav Division. He has also commanded A/2-8 Cav and HHC, 1st Bde, 1st Cav Division. He is currently assigned to the Directorate of Training Development at Ft. Knox, Ky.

Armor Center Tank Design Contest

The post Cold War Army demands a new and revolutionary change in tank design and development philosophy. Given the changing global situation and a constantly decreasing defense budget, it is important for us to draw new ideas to the forefront. Do not misunderstand the intent of the contest. The Army materiel development community has and continues to provide the American soldiers with the best and most advanced equipment and weapon systems in the world. This contest was conceived to generate thoughts about Armor and Armored Cavalry and to gain access to your ideas and concepts on the future tank systems needed to equip future tank and armored cavalry organizations. To establish a starting point, relative to all entries, you will find below a definition of the "tank," and the objectives of the contest. Good luck.

Definition of a Tank

The tank is an all-weather, day/night, multipurpose weapon system incorporating a high degree of tactical mobility, and protected firepower, capable of conducting sustained combat operations against a determined, sophisticated threat. The tank accurately fires a variety of lethal munitions (while stationary and on the move), can rapidly move across the battlefield (on roads or cross-country), and with its armor protection (to include electronic warfare sensors and countermeasures), can survive most threats encountered in the close battle area. The tank's inherent lethality, mobility, and survivability provide commanders a high degree of tactical flexibility and enable rapid concentration of combat power at decisive points on the battlefield.

The principle role of the tank is to lead ground forces in offensive operations.

Contest Objective

The role of the main battle tank to lead ground forces in offensive operations will continue for the foreseeable future. There are new and worthwhile ideas as to how this role can best be fulfilled. Consequently, the purpose of this contest is to develop ideas for an advanced land combat vehicle, or components thereof, which will substantially increase the shock effect, lethality, and survivability of tank and armored cavalry organizations in operations over all types of terrain, in all weather conditions. While its configuration and the time at which it might be fielded are not overriding factors, you should attempt to aim your effort at a successor for today's tank. The current Armor community priorities for a future tank are:

- Lethality
- Survivability
 - Mobility/Agility
 - Protection
- Deployability
- Sustainability

The future tank must be transportable by current U.S. transportation assets. The tank must also weigh no more than 55 tons combat loaded.

General Design Parameters

Include in your entry general design information such as: vehicle weight, crew size, type of weapon systems and caliber size, engine type, and tracked or wheeled, etc. You are not limited to the above. This will assist

the judges in understanding your design.

Rules

1. With the exception of the Rules Committee, judges, the contest officials/workers and their family members, the contest is open to all who desire to enter.

2. United States Government employees may not submit work produced in their official capacity.

3. Ideas or designs submitted **will not** include classified military information or previously published information.

4. Ideas or designs may be simple in format and, where used, only rudimentary sketches are necessary. However, the more detailed the drawings, the easier it is for the judges to understand the concept. Judging will be based on how well your concept matches the priorities listed in the contest objective paragraph above. All of the priorities must be addressed in your entry.

5. Ideas or designs must be for a complete vehicle.

6. Idea/design entries will be no more than five 8x10 pages, one sided, single spaced; that includes drawings/diagrams.

7. Only one entry per contestant allowed and only one prize will be awarded to any one individual.

8. Each idea or design will be accompanied by a signed official entry form. You may reproduce the entry form in this magazine, if needed. However, your signature must be an original.

9. Receipt and evaluation of designs and ideas does not imply a promise to pay, a recognition of novelty or origi-

nality, or a contractual relationship such as would render the U.S. Armor Association or the United States Government liable to pay for any use of the information contained in entries.

10. Entries must be received by 15 January 1993 to be considered for an

award. You must include a self-addressed, stamped envelope in order for your entries to be acknowledged as received! Please do not call the Armor Association or Armor Magazine to verify receipt of your entry. Allow 4-6 weeks to receive your verification in

the mail. There will be no notification for eliminated entries.

11. All entries must be in English and must be legible.

12. At the conclusion of the contest, all entries and forms will be kept by the United States Government. Entries will not be returned!

13. All rules must be followed to preclude elimination from the contest.

Official Tank Design Contest Entry Form

Attach this form to your entry for the U.S. Army Armor Center/U.S. Armor Association Tank Design Contest. I understand and consent that after the receipt and evaluation of my design or idea, the United States Government may use my design or idea without the U.S. Armor Association or the United States Government incurring any obligation or liability to me, my heirs, or assigns. I also waive any proprietary rights that I may have in this design or idea.

Send entire entry to: **Armor, ATTN: ATSB-AM
(Tank Design Contest)
Fort Knox, KY 40121-5210**

DATA REQUIRED BY THE PRIVACY ACT OF 1974

Authority: 10 USC 3013

Principal Purpose: (a) Address and phone number are required so that winners may be informed and (b) Employment category is required to ensure conformance with applicable laws.

Routine Uses: Address and phone number - to inform winners. Employment category - to ensure compliance with applicable laws.

Mandatory or Voluntary Disclosure and Effect on Individual Not Providing Information: Disclosure of information is voluntary. However, failure to provide any of the information may result in delayed notification of a winning entry.

(Signature)

(Date)

(Print or type name, rank if military or title if civilian)

Home address and phone:

Work address and phone:

Please Check One:
(Who do you work for)

DOD
(Dept. of Defense)

Government
Contractor

Other

Judges

Entries will be judged by a panel of combat and materiel developers from the U.S. Army Armor Center and various research and development centers. Their selections will be final and binding.

Prizes

1. First prize - \$500
Second prize - \$300
Third prize - \$200
Fourth prize - \$100
2. In addition, the fifth through the tenth place contestants will receive an appropriate certificate and a two-year honorary membership in the U.S. Armor Association.
3. Winners will be announced at the Armor Conference in May of 1993.
4. Prizes will be donated by the U.S. Armor Association to the winners.
5. Awards will be presented by appropriate representatives of the U.S. Armor Association. You need not be present at the Armor Conference to win.

We are hopeful that many good ideas will be forthcoming. Let your imagination run wild. Sketches mailed with the entry forms need not be professionally prepared as long as the idea is adequately presented.

Remember, all entries must reach the Armor Magazine office not later than 15 January 1993 to be considered.

The timetable of the contest calls for a preliminary judging in January 1993 with the final judging prior to the Armor Conference in May. Winners will be announced at the Armor Conference and in the following issue of ARMOR magazine.

BOOKS

A Good Book on Panama, But Not Critical Enough

A bit too glossy and simplistic, with limited battlefield accounts, but authors offer strong chapters on Just Cause planning and decisionmaking



A Sheridan crew pauses in Panama City.

OPERATION JUST CAUSE: The Storming of Panama by Thomas Donnelly, Margaret Roth, and Caleb Baker. Lexington Books, 1991. 453 pages. \$24.95.

This is not the first book about the 1989 invasion of Panama, but to date, it is the most important. It is the first comprehensive look at U.S. military operations before, during, and after the December 20th assault. However, the lasting importance of this book may be what it says about the future, rather than what it records about the past.

In the minds of many, Operation JUST CAUSE has been overshadowed by the larger events of Operation DESERT SHIELD and DESERT STORM. JUST CAUSE fades into the background when compared to the awesome sweep of the storm in the desert. But it is folly to think of JUST CAUSE as simply one more in a continuing chain of U.S. interventions in the Caribbean Basin and Latin America. JUST CAUSE may be more accurately examined as a harbinger of likely U.S. military operations in a post-Cold War world. Future conflicts will be more in the image of JUST CAUSE than of DESERT STORM. The invasion of Iraq will become more of an anomaly than the invasion of Panama. For that reason alone, this book is worth reading.

The Panama experience is an example of the most likely threats that will challenge the U.S. military in the unstable world that follows the breakup of the Soviet empire. The Republic of Panama typified many of

the elements we are likely to encounter in the future: military dictatorship, a disenfranchised populace, poverty, urban terrorism, rural guerrilla warfare, hostage-taking, and the specter of international narcotics trafficking. These elements may define future military strategy, if not in Panama, then in some similar regionally focused locale. The day of the monolithic threat from the Soviet Union is over, and operations such as JUST CAUSE will become the model for power projections of the future.

The flaw in this book is that it is not critical enough of the military force, the plan, the politics, or the execution to make it a truly useful tool to students of history. It is too glossy in its review and too simplistic in its analysis. The fault lies primarily with how the authors earn their living. Reporters for *Army Times* can hardly be expected to seriously criticize their prime source of information. It's a case of biting the hand that feeds you, and runs the risk of alienation. Another flaw that appears throughout the book is the apparent reliance on just a few sources of battlefield accounts. Unless the reader pays close attention, he might conclude that the soldiers of 3d Platoon, Company C, 3d Battalion, 75th Ranger Regiment fought the campaign by themselves. This is inadvertent, but when coupled with the numerous equipment and weapons misidentifications, is irritating to the military reader. We expect more from writers at *Army Times*. Nevertheless, this book should be read and discussed by those in the military or those concerned about the future course of world events. The authors should be commended for recognizing the importance of the Panamanian campaign

and its place in military history, even as the stage was being set for DESERT STORM. Like DESERT STORM, JUST CAUSE was a victory for U.S. military doctrine and training and a testament to the quality of the fighting force. Donnelly, Roth, and Baker have captured the essence of that victory. Their chapters on the operational planning and the command decisionmaking are worthy, and open a window on the process.

The vitality of democracy in Panama remains in doubt. The ability of the Endara government to bring about real reform remains in doubt. The subordination of the Panamanian Defense Forces remains in doubt. The drugs continue to flow, and the money laundering is unabated. This crisis is not over.

Donnelly, Roth, and Baker have opened a window on the future. As military professionals, we would be wise to peer out.

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In Mortal Combat: Korea 1950-1955 by John Toland. William Morrow and Company, Inc., New York, 1991. 624 pages. \$25.00.

Readers of Toland's studies of World War II will not be disappointed with his new assessment of the Korean War. Relying (as in the past) on oral taped interviews with participants, Toland emphasizes American, Communist Chinese, and Soviet involvement in the Korean War.

The North Korean invasion of South Korea on June 25, 1950, caught the United States and its allies by surprise. The virtual annihilation of the U.S. Army's Task Force Smith, the turn in the United Nations' favor with General MacArthur's Inchon landing, and General Walton Walker's holding of the line at Pusan, the drive to the north by mid-October, and the subsequent dashing of hopes by the North Korean counteroffensive are familiar to most students of the Korean conflict. Toland makes his most original contribution in describing the events which were to follow, including the Communist offensive to the south (to end in mid-January 1951), the United Nations' breakout and offensive back to the 38th Parallel, and the long, laborious two years of peace negotiations, completed only in July 1953. As in Vietnam, approximately half (here 45 percent) of the United Nations' casualties were to occur after the start of the negotiations.

In contrast to Max Hastings' *The Korean War*, (pp. 120, 188), which termed General Walker brave, but not clever, and somewhat unorganized, Toland felt (pp. 373-75) that Walker, defender of the port of Pusan in 1950, performed as capably as any military leader could have done. By withdrawing quickly to the Pusan perimeter in September, Walker saved most of his Eighth Army. Relying mainly on an interview with Eugene Michael Lynch, pilot for both Walker and General Matthew Ridgway, Toland concluded that Ridgway, less prone than Walker to clashes with other general officers, also benefited from having been given more power when he succeeded Walker (December 1950) as Eighth Army commander. Toland does not really differ from other authorities in his assessments of Generals Douglas MacArthur and Ridgway, MacArthur's successor in April 1951 as commander-in-chief of the United Nations forces. However, Ridgway emerges as a singularly uncompromising negotiator at the Panmunjom peace talks.

After interviewing a number of ROK (Republic of Korea) commanders, Toland gained a new appreciation for Peng Teh-huai, leader of the Communist Chinese "volunteer" army. According to Toland, it was Peng (pp. 236-37) who convinced Mao Tse-tung to intervene militarily on the North Korean side. Peng himself set the trap for U.N. forces at the Chosin Reservoir in November 1950, thus preparing the way for a prolonged war. Appointed Mao's Defense Minister in 1959, Peng was tortured to death in the subsequent Chinese Cultural Revolution.

Like other authorities, Toland believed that the conflict finally came to an end at the Panmunjom peace table at least in part

because those who had begun the war had either left office (President Harry S. Truman, for instance), or had died (Stalin's passing in March 1953 led to pressure by the Kremlin on Peking to continue negotiating). In contrast to Hastings (p. 188), who wrote that the White House seriously considered using the atom bomb in late 1950, Toland concluded that Truman's famous November 30, 1950, statement, which did not exclude the nuclear option, was (p. 352) a threat more intended to intimidate the enemy than one actually to be feared.

In analyzing Communist Chinese and Soviet Russian involvement in prolonging the war, Toland has made his strongest contribution. Reappraisals of General Walker, Marshal Peng, and the role of the A-bomb will all provide grist for future mills of historical revisionism. The only criticism of Toland lies in his brief documentation. There are no footnotes. For the bibliography, he lists only those interviewed as well as major sources, without specific pagination. This does not preclude consultation of other works for more detailed information. Toland's overall interpretation is sound, his assessments of leadership shrewd and stimulating, his prose style clear and free from military jargon or verbal obfuscation. Written in the aftermath of the Vietnam War, which influenced Toland's interpretation, *In Mortal Combat* is an excellent work for students of history and of military strategy.

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Give War A Chance by P.J. O'Rourke, Atlantic Monthly Press, New York, 1992. 233 pages. \$20.95

Read this book. Life is the search for truth, and you can find bits of the truth in strange places. P.J. O'Rourke, an author I confess I'd never heard of until a friend recommended this book, gives a tongue-in-cheek view of the war in the Gulf (and other places), liberals in American politics, and silliness in government. The chapter on the war is the best one in the book.

O'Rourke, a sometime correspondent for *Rolling Stone*, covered the war for ABC Radio News. His gift to his readers, though, is the critical eye and analysis of things government and military. He IS NOT critical of our soldiers or our profession. He is critical of our handling of the press and the policy that put our soldiers into harm's way.

O'Rourke writes, "Death is the result of bad politics." He relates stories of famine in Africa, drugs in American cities, but mostly the death facing soldiers in the desert. He then marvels that morale "seems to be ridiculously good." O'Rourke writes that every PFC seemed to know he was in the desert facing a "tin-pot" dictator with the world's fourth largest army so other tin-pot dictators, "don't dis Uncle." Our soldiers impressed many people with their grasp of the world and their part in it. O'Rourke also writes, "It's important to remember that the U.S. military is not made up of Oliver Stone and his hootch-torching platoon of hop-heads...They've got skills, training, education, and if they'd just quit calling me 'sir'...they'd be the salt of the earth."

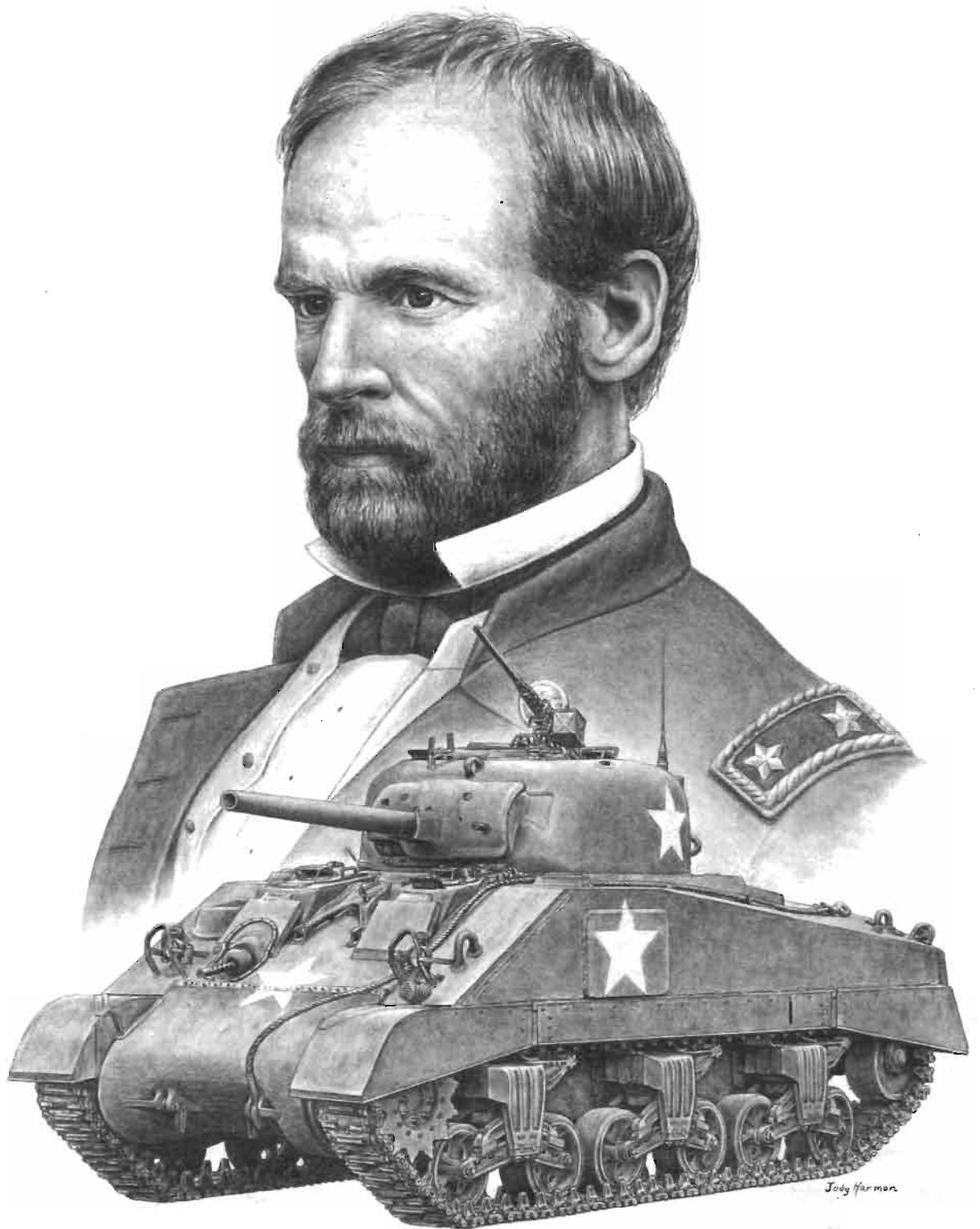
Just before I started to feel overly good about the military, O'Rourke turned his eye toward the Joint Information Bureau (JIB). I hope one of the stalwarts that worked in that thankless place writes his side of the story. O'Rourke nails the military use of "jargon" as the major impediment to good journalism, writing, "Spend more than an hour at the JIB, and you begin calling the staircase 'a foot-impelled bi-directional vertical transport asset'." O'Rourke correctly points out that we lapse into military-speak, the language we are most comfortable with and no one else understands. This is a real lesson learned, if and when we fight again, and again deal with the press. We are the ones that call a nut, from nut and bolt, "a hexaform rotatable surface compression unit."

O'Rourke saw the destruction caused by the Scud hit on the barracks in Dhahran 25 February 1991. He walked along the Basra road and through Kuwait City after the cease-fire. In a funny, literate way, he tells his readers war is boring, terrifying, funny, awesome; all the cliches from old war movies apply. He ends the book describing buzzing a little Arab boy near a Bedouin encampment in a C-130.

"We were so close, I could see his expression — thrill and fear and awe and wonder combined. His whole life, he'll remember the moment that sky-blackening, air-mauling, thunder-engined steel firmament of war crossed his face. And I hope all his bellicose, fanatical, senseless, quarrel-mongering neighbors — from Tel Aviv to Khartoum, from Tripoli to Tehran — remember it, too."

This is a very good, funny book that will make you think. I heartily recommend it.

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SHERMAN

"The Namesake Series"

This portrait of General William T. Sherman and the M4 medium tank that later bore his name is another in the new series by ARMOR Contributing Artist SPC Jody Harman. The portraits are in color and will be available through the U.S. Armor Association.