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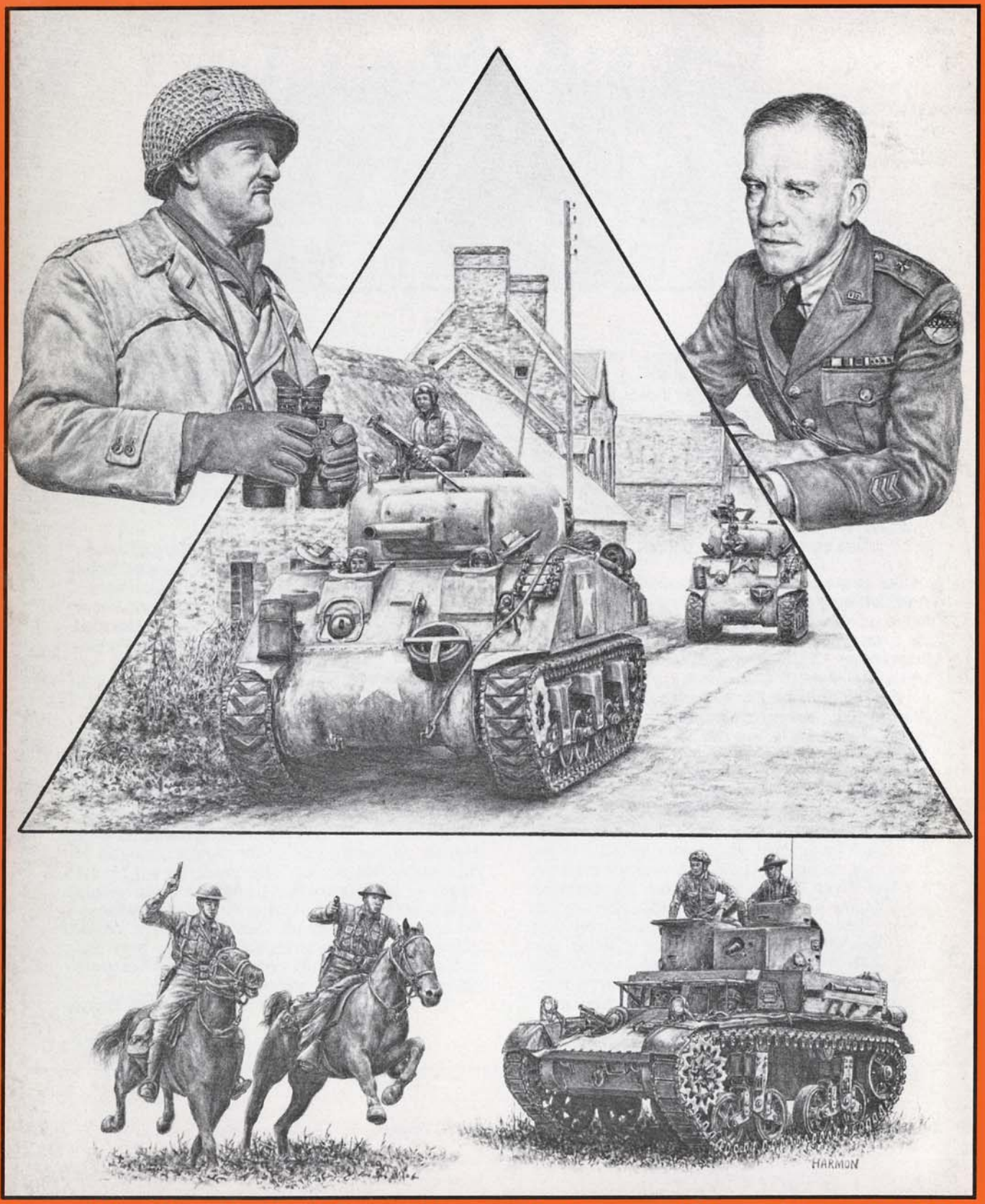


From Doctrine to Decision: Armor History and Operations in 1944

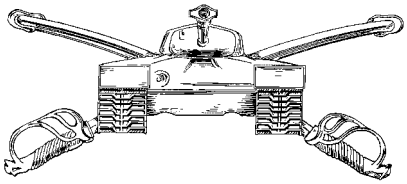
PB 17-94-5

September-October 1994

First With The Most

As we go to press with this issue, the evening news leaves me aghast at the suffering, starvation, and disease in Rwanda. The Air Force is trying its air-drop version of Biblical manna from heaven. I hope it works. But I'm getting that sinking feeling that some policymaker is about to inform us that nothing short of Americans on the ground is going to keep that last horseman from coming on line with famine, pestilence, and death in some apocalyptic column of fours. Is it just me, or do we seem to be railing against forces we cannot control?

Most of the people who are paid to think in this Army will quickly tell you that this is the way things are going to be for a long time into the twenty-first century. All you have to do is count the number of times the phrase "Operations Other Than War" (OTW) pops up in the professional journals — this one included — and the focus of current military thinking will be clear. It would be easy to be duped into believing that these OTW missions are somehow safer, less challenging, than the classic defense of the Fulda Gap so many of us cut our military teeth on. But that would be a grave mistake. Humanitarian aid missions, where you are literally standing between millions of starving people and their next meal, can get you killed if you are anything less than vigilant. Peacekeeping missions, which might more accurately be labeled war-keeping missions, since they always seem to occur where there is no peace, can be deadly for the soldiers who take them lightly. The simple fact is, just because the S2 can't produce an order of battle, and just because some classic Saddamic opponent isn't maneuvering an organized force against us, doesn't mean we are in less danger. It usually means we are at greater risk. It will take all of our soldier and leader skills just to stay alive and fulfill the missions we receive.



Given those likely impending missions, if you're still operating on the belief that the Forward Edge of the Battle Area (FEBA) is a line drawn across the battalion front, you'd better wake up. They haven't changed the field manual to reflect it yet, but Somalia veterans will tell you that nowadays the FEBA is a circle drawn around *you.*

As we have since 1888, *ARMOR* will continue to prepare mounted warriors for the impending conflict, whatever shape it may take. In this issue, and the Nov-Dec issue as well, we will examine some of the lessons learned in Somalia — not that our next challenge will be the same — but it will likely be similar. Our writers speak not from theory alone, but from experience. As mounted soldiers who will probably find themselves working more closely than ever with dismounted troops in fluid circumstances, it will profit all of us to heed their advice.

— J.D. Brewer

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General, United States Army
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LETTERS

A New Tank: Time to Begin

Dear Sir:

J.B. Gilvydis' article in the May-June 1994 issue of *ARMOR* is a good think piece for our Army's leadership and its would-be combat developers and tank designers. I read it with great interest as I have been an admirer of J.B.'s work, and his predecessor Cliff Bradley's, for the past 30-plus years. From a technical standpoint, what is said in the article is right on target. Whether or not a two-man crew is in our Army's future scheme of things is questionable, but as pointed out, certainly merits study from all sides.

The article's summary is the real think piece. If our Army is to have a new tank anywhere in the foreseeable future in today's environment of very reduced budgets, it has to get its act together and speak with one voice and not as many "tiny empires" so aptly described in the article — "But if the tank community continues to function in its fragmented, semi-independent way, we will fail to achieve the requirements projected here for an effective tank in the year 2010." Had the Army not spoken with one voice through the 1970s, it would have fought DESERT STORM with upgraded M60A3s and not the M1A1. Our Army would have won, but with greatly increased casualties. Thanks to leaders and managers of vision over 20 years ago, that war was fought with the best tank in the world; but how long will it remain so? I think the Army finds itself today where it was in 1970 — at a time to make the hard decisions and continue with improvements to the current tank (M60A1 then, M1A2 now); but at the same time, to look to the future, and to again speak with one voice and develop a revolutionary new tank for the year 2010 and beyond. To do this, the Army's leadership must recognize that it cannot make do by continually improving

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the M1; it must start today defining the requirements for a new tank; it must bite the bullet now and set the tough dollar, technical, and schedule priorities and adhere to them through development and into production against an established fielding date; and most important, the Army must have the courage of its convictions to stay the course. Otherwise, it could find itself outgunned on an early 21st Century battlefield. As J.B. Gilvydis says, "Presently, no one organization is responsible, no one organization is accountable for the actions or lack of them in their tiny empires. We lack the authority to plan, coordinate, and oversee all tank-related work. Which way we will choose to go is up to us. Will it be with the soldier, the Army and the country, or the tiny empires?"

It has to be with the soldier, the Army, and the country. Let's fix it now!!!

STAN R. SHERIDAN
MG, USA, Ret.
Naples, Fla.

The Four-Man Crew Works, Don't Fix It!

Dear Sir:

On reading Mr. Gilvydis' article in the May-June *ARMOR* Magazine, I am quite impressed with his academic background. However, I think he is missing some important practical considerations.

Mr. Gilvydis says that four-man tank crews are a thing of the past. He wants to add more equipment, and give us fewer people to work on it with. I do not think this is a good idea. I don't want an autoloader, and I feel safe in saying most of my contemporaries don't either. He talks about the tanks of France, the former Soviet Union, and Japan, and their autoloader-equipped tanks. Are these really countries that we want to emulate in tank design? The Soviet designed tanks in Iraq didn't seem to be too impressive to me.

Mr. Gilvydis also talks about the loader taking other crewmen's jobs — wrong. You have to have a loader. If the loader gets knocked out, most TCs will move to the loader's station and load/TC from there. If the gunner is knocked out, the TC guns from the TC position. If the driver is knocked out, the gunner replaces him. A four-man crew means versatility.

About the gunner — with all the fratricide incidents we have had, is it really wise to turn pulling the trigger over to a computer? I don't want to be on any battlefield where a computer is calling the shots. I want a trained human gunner identifying and confirming his target, so fratricide doesn't become a bigger problem than it is. What if this "computer gunner" breaks? Have we just lost the complete use of one tank?

Mr. Gilvydis talks of the shrinking manpower pool, and cites this as a reason to go to a two-man vehicle. Then, in the same paragraph, he talks of plans to use a "split crew pool" with four-men assigned to each two man tank. Either we have four men for a crew or we don't. Which is it? How do we swap out these crews in a battle? Blow a whistle? I also like his idea about getting the infantry to help us work on our vehicles. First, they will not do it. The infantry will have missions of their own, which, I am fairly certain, will not include working on our vehicles; and second, they don't know anything about a tank. It takes months of training to turn a crewman into a competent mechanic. We don't have time to train every infantryman in the Army to be a tank mechanic. Any tanker waiting on someone outside his platoon (or company, at best) is going to be waiting a long time.

Mr. Gilvydis also speaks of giving the individual tank commanders the ability to "watch a whole battlefield panorama and beyond" and "watch it from many different elevations and directions." I am telling you there is such a thing as too much information. While our TCs are trying to figure out what they are seeing, somebody with a third grade education and a Korean War surplus bazooka is going to punch his ticket for him. With the possible exception of the company and battalion commanders' vehicles, TCs don't want or need to know what is going on outside of their area of interest, and worrying about it could get them killed.

Has anyone considered the effects of EMP on all this neat gee-whiz gear? I don't know a great deal about it, but it strikes me as a definite point to be considered.

I have probably missed more points than I have covered, but the bottom line is this: Four-man crews work very well. They allow for flexibility, self-recovery/repair, security, and even a moderate amount of crew rest.

I don't have all the degrees Mr. Gilvydis has, but I do have one very important thing — experience.

SFC JOHN M. LOCKE
5/17 Cavalry
Korea

The Two-Man Crew — A Step in the Wrong Direction

Dear Sir:

Congratulations on the May-June 1994 *ARMOR*. It was a very thought-provoking issue that will probably generate a lot of discussion over the coming months. J.B. Gilvydis' article, "A Future U.S. Main Battle Tank for the Year 2010 — A New Vision," although very interesting, is anything but new. Discussions concerning the future U.S. main battle tank have been going on for some time. Apparently, in his haste to jump on the reduced-tank-crew bandwagon, he missed the key issue about the "two-man crew station." While reality may dictate the replacement of a human loader with a reliable automatic device, the replacement of the gunner is another matter. What Mr. Gilvydis has failed to recognize is that the addition of the gunner's responsibilities to the demands of the tank commander does not replace the gunner; it replaces the tank commander. That seems like a high price to pay. Before anyone decides that "the tank will not suffer at all" when it is designed around a two-man crew, they should listen to all those experienced NCOs and officers who continue to say that such an advancement would be a step in the wrong direction.

Also, I would like to add some facts to the important discussion concerning "Armor in the 21st Century" by MAJ Harold Spurgeon and Stanley Crist (*ARMOR,* January-February 1994) and more specifically the letter by A.J. "Beau" Bergeron that appeared in the May-June 1994 issue. "Blacklisting" or being "barred from Fiddler's Green" is probably not required. Bergeron's comments dealing with Armor's inability to "really participate in a force projection strategy because we cannot rapidly deploy!" are old generalizations. While in a DESERT STORM-like deployment, the time required to get a large enough force deployed is critical, in the post-DESERT STORM world, large heavy force deployments are becoming less and less likely. The new reality will include (at least initially) small-scale rapid deployment of heavy forces — as was the case of the deployment to Somalia.

The 24th Infantry Division (Mechanized) deployment of Task Force ROGUE to Somalia is a classic example for the future. Alerted on 4 October 1993, the division and the 2d VANGUARD Brigade readied and deployed the Immediate Ready Company (IRC) consisting of four M1A1s, four M2s, two M113s, and 68 personnel. The division's IRC was wheels up at N+1 day through N+3 days aboard seven C-5As. The remainder of Task Force ROGUE's airlift deployment, the Division Ready Force/Fly Away (DRF/FA), consisting of C/3-15 IN(-) and a Task Force C2 and support package was wheels up at N+3 days through N+5 days in 14 C-5As.

While just about everyone would agree that making the heavy force more deployable is a necessity, the doomsayers need to keep the rapid deployment of Task Force

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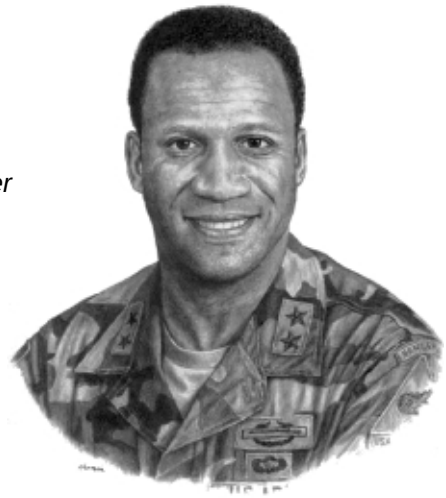
MG Larry R. Jordan
Commanding General
U.S. Army Armor Center



The Combined Arms Commander: New Challenges and New Approaches

The mounted combined arms team, while predominately armored and mechanized, has components from across the entire force, to include light or dismounted elements. In the same way, we find armored elements operating within the overall concept of Dismounted Battlespace. These forces, drawn from other than the predominate type combat element present, bring a very necessary capability and addition to the force. This enables the commander to perform very specific tasks that the bulk of his forces may be ill-suited to conduct. The operational value and rationale for a light-heavy and heavy-light mix of forces has been borne out in training conducted at the Combat Training Centers and during our recent operational experience, ranging from JUST CAUSE and DESERT STORM to operations in Somalia.

The synergy and additional capability produced by such task organization and force pairing have been repeatedly demonstrated. This approach to organization for combat, combined with tremendous advances in Battle Command and situational awareness due to digitization and other applications of technology, empower the commander to employ combat power in ways never envisioned.

The Force XXI commander of the next century must not only have the skills necessary to use advanced technology, but must be developed and trained to operate on the more complex and specialized battlefield associated with either Mounted or Dismounted Battlespace. We may even find that, depending on the nature of the conflict and the battlefield, the bulk of the operation could be conducted within the Battle Dynamic of Depth and Simultaneous Attack. While the requirement for maneuver forces is unquestionably necessary for decisive victory in the overwhelming number of cases, there could be those instances where the battle may be predominately indirect and precision long-range fires. Conventional maneuver elements might play a supporting or enabling role.

In each case, the ground commander (I include Army Aviation as part of the ground combat regime) must understand the full relationship between all forms of combat power and the desired effect on the enemy. He must relate available combat power, in whatever variety, to the enemy, to the ground, and to the mission and objective. A traditional, branch-based approach to training for this form of warfare is not adequate beyond the lowest tactical levels. The combined arms commander must possess skills much more involved with integrating forces than with displaying a particular branch expertise.

The emerging requirements of 21st Century battle drive us both to specialization and to versatility in our forces and our commanders. While the tanker or infantryman must be able to operate within Mounted or Dismounted Battlespace, or in support of the Battle Dynamic concerned with depth, simultaneity, and fires, we should not expect them and their leaders to be equally proficient in all. Rather than attempting the near impossible task of training our wide variety of mounted forces — armor, light armor, cavalry, mechanized infantry — to operate equally well within all the Battle Dynamics, we should focus the training of units and the development of commanders with cross-training as necessary. While most tank battalions would focus on operating within Mounted Battlespace, they would be capable, with additional training, of contributing within Dismounted Battlespace. Specified units should be identified for training necessary to prepare them for early entry and the predominately dismounted fight. Units equipped and trained as light armor or cavalry could be earmarked for this role. The same approach could be taken with infantry, engineers, and other forces. Current warfare is too complex to train infantrymen, engineers, or tankers to the same level of proficiency across all possible contingencies and each Battle Dynamic.

The training and professional development needs of leaders and commanders in the future must be tied to the Battle Dynamics in which they will predominately operate. Like so much else associated with Force XXI — the Army of the next century, leader development will require new and innovative approaches. Not only will leaders require new and additional skills, the training establishment must take new approaches to preparing that combined arms commander.

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

The Excellence in Armor Program Depends on Leaders' Support

The Expert Infantry Badge and the Expert Field Medical Badge both signify excellence, and are awarded on the basis of proven skill, performance, and technical and tactical competence. In addition, soldiers who earn the EIB or EFMB are authorized to wear a badge on their uniforms and receive ten promotion points. While some soldiers may not be fully aware of its existence, the Armor Branch has a program which identifies quality performers: the Excellence in Armor (EIA) program. While there is currently no badge for EIA, the EIA soldier can receive 50 promotion points toward SSG, as opposed to only ten for the EIB and EFMB.

The Excellence in Armor program was proposed by the Armor Center to Department of the Army in May 1984. The program was approved as a pilot in July 1984, and due to the success of the pilot project, the EIA program was approved for full implementation in October 1987. Since its inception, over 3,100 active and 800 reserve soldiers have been enrolled.

Soldiers in the rank of PV1 through SFC may be enrolled either during One Station Unit Training (OSUT) or at their duty station:

- Drill sergeants recommend OSUT soldiers in the tenth week of training, based on performance, motivation, and leadership potential. They are confirmed by a battalion-level board chaired by the battalion/squadron command sergeant major. The soldier will then be officially enrolled in the program when he graduates and meets the following minimum standards: APFT of 230; weapons qualification of sharpshooter; passes all armor crewman tests, Armor stakes, and end of block test; and has a high school diploma or the equivalent. During OSUT, the EIA soldier will receive more than 50 additional hours of training, compared to his peers.
- In Armor/Cavalry units, soldiers in the rank of PV1 through SFC may be recommended for enrollment by their company/troop commander and approved by the battalion/squadron commander. The criteria for unit enrollment are: a commander's subjective evaluation of the soldier's tactical/technical proficiency, leadership potential, and motivation; passing the CTT and TCCT/SCCT I test; and qualifying on their individual weapon as a sharpshooter. (A qualifying score on the SDT will become a standard in FY95 for NCOs. The previous SQT standard was 90.)

The EIA program provides participants several benefits that offer an incentive for exceptional performance and help lead to their retention. The most important of these are:

- OSUT commanders can advance up to 10 percent of each OSUT class to PV2 upon completion of the BCT phase and an additional 10 percent to PFC upon completion of the MOS-specific phase. EIA designees receive the advanced promotions.
- A SGT(P) may receive 50 additional promotion points toward SSG by passing the TCCT/SCCT II with a score of 70. A soldier must be enrolled in EIA to take the exam.
- All senior NCO promotion boards are briefed that EIA identifies an Armor soldier who is a "cut above."
- Probably the most important incentive, and the one that receives the least attention, is simply the improved morale from recognizing a soldier who is an outstanding performer. In addition, the message is reinforced that outstanding performance may result in accelerated performance, a powerful motivator.

But, the real question for Armor leaders is: Why should I support the program? The primary answer is the same as the goals of the program: To fill tank/cavalry vehicle commander's hatches with bright, highly motivated soldiers whose performance is consistently outstanding, and to provide incentives which will lead to the retention of quality NCOs. But the EIA program will not survive and provide the benefits to units and to the Armor Branch unless it is fully supported by leaders in the field. Armor leaders have four primary responsibilities for EIA:

- Identify and challenge incoming EIA soldiers.
- Establish and support a unit EIA program.
- Accelerate SPC/SGT/SSG promotions for EIA enrollees. (If the EIA soldier does not warrant accelerated promotion, he is probably not EIA material.)
- Maintain quality in the program by enrolling quality soldiers in EIA and disenrolling soldiers who no longer meet the EIA standards.

EIA is your program, and with your support we will maintain a quality EIA program that will begin developing Armor leaders to guide the Armor Branch into the 21st Century. I encourage you to contact the Office of the Chief of Armor at Fort Knox for more information on EIA.

The POCs for the program are SFC Berg and SFC Solomon at DSN 464-3188/5155 or commercial (502)624-3188/5155. They can also be reached by writing to: Commander, U.S. Army Armor Center and Fort Knox, ATTN: ATZK-ARP (EIA), Fort Knox, KY 40121-5000.

Light tanks support the 66th Infantry during 3d Army maneuvers at Fort Benning in April 1940, when armor doctrine was still developing.

Armor History and Operations in 1944

The 6th Armored Division Experience in the European Theater of Operations A Study in Leadership Development and Execution

by George F. Hofmann, Ph.D.

Introduction

The commander of the famous Third Army in Europe during World War II, General George S. Patton, Jr., said that the 6th Armored Division and its leader, Major General Robert W. Grow, was among his best. He wrote General Grow: "Much of the glory which the Third Army has achieved has resulted from the gallantry and energy you and your division have displayed from Avranches to the Mulda River." Patton's chief of staff added that the "Super Sixth" was one of the most dependable divisions that served in the Third Army during the drive across France and Germany.[1] There was no doubt that the 6th Armored Division achieved one of the most splendid divisional records of the war. The "Super Sixth" was continuously in action since committed to combat on 29 July 1944, except for a period of less than two weeks. Its history was one of accomplishment and determination. Very few matched the durability of its leader and troops. At the U.S. Army Armor Conference in May 1971, a number of veterans from the 6th AD met as usual with their former commander. "He meant business, but he treated us like a father and always looked after his boys," one veteran stated as he spoke for the group.[2]

The citizen soldiers who composed the majority of the division, and the Reserve and National Guard officers who commanded them, proved themselves determined fighters. Grow had a very basic philosophy on staff selection: he wanted no yes men — only officers who were professionally capable, with good, firm personalities to deal with commanders. He wanted only reserve officers who were not likely to be plucked out by higher commands. When he became division commander in 1943, he had the sad experience of losing the Regular Army staff to corps and higher headquarters. Grow did not want a similar shifting of staff personnel when the division entered combat. So it was that his staff remained intact throughout the duration of the European campaigns.[3]

It is the well trained and determined soldiers, not a set type of organization, that wins battles. However, organization provides a framework within which soldiers are able to fight more effectively by taking advantage of each other's skills and weapons. The 6th AD was organized like all other armored divisions, with the exception of the 2d and 3d. Within the standard organization, the several components (battalions, companies and platoons) could be grouped into a variety of formations designed to carry out prescribed missions with due regard to enemy, friendly forces, terrain, weather, logistics, fatigue, combat losses, and tactical air support. A background analysis of the manner in which the operational skills of the division were grouped into combat commands and task forces will assist the reader to understand the actions that have been described. Therefore, the thrust of this paper will be to evaluate the development of military leadership in respect to organization, operational skills, and tactics by examining the military education and conditioning process of the 6th AD commander.

Leadership Development and Execution

On the political side Grow, early in his career, came in contact with the future Supreme Court Judge Hugo L. Black. Both served in the same regiment in 1918, Grow as young lieutenant and Black as a captain and adjutant. The controversial Black, a populist democrat who would join the KKK in

1923, taught Grow by bad example not to mix politics with military discipline.[4]

A philosophy of life also acts to mold leadership. Grow did not believe in the superstitions and pagan formalities cherished by the churches. He believed in an all-powerful force, a supreme being not of human form that was the prime mover of human life. To Grow, life itself was everlasting but the individual was not immortal. To be sure, he was not disturbed about the prospect of his existence ceasing with death; all one had to do was his best. Death in combat was a way of life for the professional soldier. However, this attitude towards life was not reserved for generals. Many GIs and officers — as the death rolls of the 6th Armored Division indicated — accepted the horrible death that came with combat.[5]

General Grow was influenced by George T. Denison's *History of Cavalry From the Earliest Times with Lessons for the Future,* especially the last two chapters that dealt with morale and command. One sentence impressed Grow when he attended the Cavalry School in the 1920s: "A cavalry general should be possessed of a strong inventive genius, and be self-reliant enough to strike out a new line and adopt reforms where he sees them necessary."[6] He was not impressed with the School's bible, R.M.P. Preston's *The Desert Mounted Corps: An Account of the Cavalry Operations in Palestine and Syria,* which argued that the horse-soldier was more valuable in "modern warfare as he had ever been in the past."[7] The future role of the horse-soldier, Grow believed, would change due to advances in technology, especially with the arrival of a new mount, the tank. He did read the works of Britain's foremost military historians, General J.F.C. Fuller and Captain Basil Liddell Hart, during the inter-war period, but was not greatly influenced by them. Grow did admire both for their heavy emphasis on tanks and on armored warfare, but he did not think they understand cavalry "as we did" in the American environment. At that time he began to realize the value of combined arms in the cavalry's role, which would require an adjustment to meet future combat situations. The future 6th AD commander believed that the function of cavalry was to fight mounted, dismounted, or both at the same time, and not act purely as a screening or reconnaissance force until the main branches of infantry and artillery came up and disposed of the enemy, as professed by the U.S. Army General Staff at the time.[8]

MG John K. Herr, the last Chief of Cavalry, on his private mount, Star Witness, a grandson of Man O'War.

MG Robert W. Grow saw himself as a cavalryman, rather than a horseman or a tankman.

Grow was even more heavily influenced by the teachings of Major General Adna R. Chaffee, Jr., known as "The Father of Armor." Unfortunately his untimely death in August 1941 prevented Chaffee from seeing the results of his labor. His foresight and experience in organization and employment of the mounted soldier were created on paper and then brought into being as the Armored Force in 1940, an integration of branches and services that was organized into a new integrated combat arm, Armor. Its origins early can be traced to the 1930s at Fort Knox, where the first U.S. mechanized cavalry went through numerous growing pains. Out of the early chaos of ideas, doctrine, and obsolete equipment emerged a team capable of fighting on new mounts. It was during those lean years that the future CG of the 6th AD came under the influence of Chaffee, and later applied his doctrine of organization and command skills to the division. Like his mentor, Grow believed that the mission of cavalry was to fight, not the generally accepted view before World War II that the mission was reconnaissance and security. For a cavalryman who was not mesmerized by the horse, it allowed for greater flexibility of mind and opened the window to fresh ideas that only the more foresighted military man, not engrossed in military traditionalism, could apply.[9]

Grow professed to be a "cavalryman" not a "tankman" nor a "horseman." During the 1930s the cavalry was undergoing a more fundamental change, due to the inability of the horse to sustain itself on the battlefield, and because it was an ineffective mount for modern weapons, a fact not accepted by many older cavalry officers. Brigadier General Daniel Van Voorhis, a cavalryman with foresight and imagination who commanded the Mechanized Force in 1930-31, and Chaffee, plus many younger open-minded officers, believed the cavalry had to develop a better horse. The tank offered one means for a soldier to fight mounted, but that was not enough, since a cavalryman must be able to fight both mounted and dismounted. Therefore, there must be a mount or mounts that would enable the cavalry to carry out all its missions. This demanded a variety of mounts of which the tank was one, an essential one, but not the sole one. The Army needed an Infantry arm that could fight dismounted and a Cavalry arm (Armor) that could fight

mounted as well as dismounted. Command headquarters were not to be administrative with fixed units but functional in order to mix units as the combat situation required. This was the basic thinking at Fort Knox that influenced Grow.[10] Also during the 1930s, Van Voorhis, Chaffee and another cavalryman, Bruce Palmer, were involved in bringing artillery to the mechanized cavalry. It was not until Major General Jacob L. Devers, an artilleryman, replaced the deceased Chaffee in 1941 that the Army achieved the high state of development of self-propelled artillery. At first, Devers had considered the tank as actually a form of artillery.

So, the main thrust at Fort Knox during the lean years was aimed at developing an arm capable of fighting mounted, independently. Unfortunately there was such a diversity of opinion that the basic problem was obscured by horse-oriented soldiers and the traditional branch chiefs. The last Chief of Cavalry, Major General John K. Herr, had initially supported the establishment of a mechanized cavalry division. Strangely, after the 1940 German blitzkrieg, he had changed his mind and refused to mechanize the horse units. These were very difficult times in developing a handle on a perceived mission because of branch opposition to the establishment of an armored force. The Chief of Infantry, Major George A. Lynch, argued that the Armored Force had only asked for a field force headquarters and not a separate arm; that the infantry and tank battalions in Chaffee's Armored Force should be returned to infantry control. General Herr argued that there was nothing in the accomplishment of an Armored Force that "could not have been accomplished equally well or better through established agencies of the War Department." He based his argument on the 1920 National Defense Act that denied the establishment of a separate tank corps.[11] Eventually, the pseudo-separate arm was called the Armored Force because of an apparent objection by General Lynch to using the word "mechanized" in the title. A similar objection was raised by General Herr; he objected to the word "tank" in the title.[12] General Devers, who replaced Chaffee, believed tanks carried too much dead weight because of their component parts, maintenance, weapons system, and ammunition. He opined "that we should go to wheels if possible." It was tried, but the experiment failed.[13] Even the head of the Army Ground Forces, Lieutenant General Lesley J. McNair, became a critic of the armored organization and found its mechanical and personnel composition too much of an expensive military investment.[14] It was quite evident that, in spite of the changes brought about by advanced technology and its effects on tactics, the opponents and the traditional chiefs were rejecting any fresh ideas that threatened their parochial thinking. Because of their fixation on tradition and branch bureacracy, their military perceptions became archaic.

LTG Patton greets MG Grow as he arrives at a meeting at Nancy, France in late 1944.

There is no doubt that peer influence had an effect on molding Grow's leadership. During the 1920s and 1930s, the Army was small and provided the opportunity for officers to become well acquainted and learn from one another. At the Command and General Staff College and War College many of the leaders of World War II developed peer union. "When you play bridge, golf, softball, handball, and ride horses with people, as well as see them in class, you get to know them pretty well." "My class," Grow said, "turned out a large number of general officers. This was very important in World War II — now it is not as easy with the large Army." One of the results of this close peer union was that it threw him into contact with the officers who would develop and lead the armored and infantry divisions of World War II. He viewed Patton as "the leader who summed up the principles of leadership by his actions, good and sometimes not so good, but who got results — victory."[15]

Grow was basically a cavalryman, but he realized, as did many of his peers struggling through the "lean years" at Fort Knox, that a new mount had arrived. Coupled with a young cavalryman's flexibility of mind and a philosophy on life, a new mount, and Chaffee's influence, the mold was set.

In the advance across Brittany to Brest between 1-8 August 1944, the 6th AD proved the soundness of cavalry tactics of maneuver, firepower, daring, and speed; only the mounts were different. The successful exploitation was due in no small part to the planning and support of supply, ordnance, and evacuation service. The speed of the division prevented the Germans from coordinating their defenses, except in Brest. When possible, the division bypassed centers of resistance; this tactic was effective because the 6th AD was more mobile than the Germans, and it was a waste of men and time to engage a strong defense. The rapid movement of the 6th AD usually provided automatic flank protection and only when the division halted was flank protection required. The deployment of the division was fast and wide, and the combat commands were positioned according to the tactical situation. For example, based upon the principle of reinforcing success, Grow several times shifted his

Reserve Command from the route of one column to another, depending upon which combat command was making the greatest forward progress. Since the Brest campaign was the 6th's first campaign, and the commanders and units lacked combat experience, Grow preferred to keep organization simple by utilizing a standard organization of three balanced combat commands with no switching of tank, infantry, or artillery battalions to meet tactical situations. The assignment of artillery battalions to columns had the effect of restricting the artillery commander's ability to direct massed fire support. In general, the Brest campaign did not give a true picture of the best way to use a flexible armored division, acting alone in exploitation deep in enemy territory.[16]

Usually all armored divisions were used as three striking forces: CCA, CCB and CCR, each having its own tactical headquarters. Generally, each command had one tank, one infantry, and one field artillery battalion, plus supporting units. Most of the armored division commanders set up a permanent or semi-permanent combat command (in the heavy armored divisions, the 2d and 3d, the regimental organization was retained). This resulted in a fixed organization, in contrast to Chaffee's concept of a flexible organization consisting of a combat command headquarters to which could be attached any number of battalions or other units required for a particular mission. The combat command was never designed for administrative control, or to have permanent or fixed units assigned. The 6th was the only armored division that conformed completely to Chaffee's basic idea. Only during the Brest campaign did the 6th adhere to a stereotypical organization; each command having one tank, one infantry, and one field artillery battalion plus supporting units.

The 6th Armored Division adhered to Chaffee's concept of two striking forces (CCA and CCB), a reserve command (sometimes referred to as CCR), an artillery command, a trains command, and a reconnaissance squadron. The Reserve Command, as Grow preferred to call it, was charged with control of all combat units not assigned to CCA or CCB, with the exception of the Recon Squadron. Although not manned or equipped to carry out extensive combat missions, the Reserve Command had the ability to undertake a combat mission of limited extent, usually defensive. However, its main role was to furnish combat units to reinforce one or both combat commands. An exception to the use of the Reserve Command as an attack unit was during the Gremecey Forest counterattack on 1 October 1944. Both combat commands were in the line and Grow, heavily pressed by Patton, had to use the reserve offensively. Artillery was not assigned to a combat command unless it was on a detached mission. After Brittany it was kept under the Division Artillery Command, with armored field battalions in direct support of combat commands or in general support, thus enabling the division to mass fires when necessary. This was particularly important for fire direction control since additional artillery battalions were usually attached to the division.[17]

BG George W. Read, Jr. commanded CCA of the 6th Armored. He attributed the unit's success to training, teamwork, and good leadership.

According to Grow, many of the armored division commanders of World War II did not understand Chaffee's concept. But the important fact remains that American divisions, both armored and infantry, had success; thereby proving that the type of organization is not the deciding factor, but rather the degree of training and the degree of understanding that exists between the combat commands and their commanders. Years later, Lieutenant General George W. Read, Jr., who commanded CCA and later was made assistant division commander, would say: "Our success was due primarily to the fine training we had undergone, aggressive leadership and the all-around team effort from top to bottom...."[18]

After the 6th AD moved to the Lorraine area at the end of September 1944, greater flexibility in organization was developed. No regular assignments were made and combat commands varied anywhere from one to six battalions, depending upon the mission. In order to make flexibility work, it was necessary that both combat commands work exactly under the same SOP, and that both combat commanders be equally well acquainted with all battalion commanders. A combat command on any one day might consist solely of its headquarters and headquarters company, as one extreme, while on the following day it might have two, three, six, eight, or any number of battalions, separate companies, or even platoons assigned to accomplish a specific mission. Thus it can be said that, even though both systems — CCA, CCB, and CCR vs. CCA, CCB, and Reserve Command — proved successful, the flexibility inherent in the 6th AD provided a more prompt and effective response than did a more rigid form. First, full advantage was taken of the situation (weather, terrain, enemy position, strength and action, plus the disposition of friendly units) by assignment of appropriate units to each combat command. Second, individual battalions and smaller units were readily relieved when suffering from fatigue or combat losses. Third, elements of the Reserve Command were used to reinforce success; and finally, the Reserve

Command was utilized as a combat command if the situation so indicated, as occurred in February 1945 at the 6th AD's Our River crossing. The Reserve Command also assumed the defensive after the two striking forces reached their objectives.

The organization could also cause disadvantages. All units, down to the platoon, had to be well trained to work together with other units under a single standard operating procedure. The organization also required exceptionally well trained and active staff at all levels to avoid confusion and assure that each element was in the proper place at the proper time with full understanding of its mission. Due to the pre-invasion training and lessons learned in combat, plus excellent staff work, many of the disadvantages were avoided. Also, it goes without saying that, in addition to an able command, staff organization and training, success demanded that each soldier know his job and that of his immediate superior. All had to be imbued with the highest degree of confidence, comradeship, and the will-to-win. This the 6th AD had in abundance. The division never had a morale problem.

A brief description of the characteristics and method of operations of the division staff, battalions, and separate companies will help to understand the part each played in the success of the 6th Armored Division.[19]

The division headquarters company provided the administrative, supply, and service personnel and the local security for both forward and rear echelons of division headquarters. The forward echelon included the division commander, assistant division commander, their aides, the liaison officers from subordinate and adjacent headquarters, chief of staff, assistant chiefs of staff G-1, G-2, G-3, and G-4, division surgeon, Signal and Engineer officers. (The latter also commanded the 25th Armored Engineer Battalion and was usually represented by an assistant division engineer.) The division chemical officer and military government officer joined the forward echelon when appropriate. G-1, G-4, and the division surgeon rotated between forward and rear echelon as the situation demanded. Forward echelon was located, both on the march, in combat, or in bivouac, as far forward as practical to facilitate communication and personal contact with combat units. The division commander or the assistant division commander, their aides and, from time to time, officers from the G-2 and G-3 sections, constituting an advance party, kept in close personal touch with the main effort during combat. At the same time Grow or his assistant CG kept in radio touch with the division command post where the chief of staff, in touch with all units through radio, wire, or liaison personnel kept the commander informed and issued orders as directed. If necessary, the chief of staff could issue orders on his own, in accordance with the plan. The magnificent communication facilities provided by the 146th Armored Signal Company rarely failed to keep all commanders and staff personnel in touch.

The headquarters commander, with the security platoon, was charged with moving, locating, and protecting the division command post as directed by the chief of staff. During rapid advances, this frequently took the party under fire as they sought a forward position in anticipation, usually proven justified, of continued advance.

The rear echelon was under control of the division trains commander for movement and security. The latter duty often fell to the band, as well as the military police platoon. In addition to headquarters and headquarters company of division trains, the following sections of division headquarters, constituting the rear echelon, were normally present: the adjutant general, inspector general, division chaplain, special services officer (including graves registration), postal officer, finance officer, provost marshal and, when not with the forward echelon, the military government officer and chemical officer as well as attached specialty teams and Red Cross field directors. There was, obviously, constant interchange between forward and rear echelons, particularly between G-1 and G-4 section personnel. The rear echelon moved less frequently than the forward and was billeted in more permanent shelter whenever practicable, as was fitting to their duties.

Conclusion

The doctrinal point held by the United States Army Ground Forces during most of World War II was that the primary role of tanks was for pursuit and exploitation. During its drive through the Brittany Peninsula during 1-8 August 1944, the 6th Armored Division's success in exploitation and pursuit was due to traditional planning that dictated equal positioning of the two striking forces, Combat Command A and B, with R in reserve, each having its own tactical headquarters. Usually, each command had one tank, one armored infantry, and one armored field artillery battalion. During the Brittany campaign, the divisional commander preferred to keep the traditional organization, three balanced combat commands with no switching of tank, infantry, and artillery battalions or other organic units from one combat command to another. In general, the drive to Brest did not give a true picture of the best way to use a flexible armored division, acting in exploitation and pursuit deep into the enemy's territory. This type of organization was in contrast to Adna Chaffee's idea of a flexible organization, consisting of a combat command headquarters that could have attached any number of battalions or other units required for a particular tactical mission. Grow, who was influenced by Chaffee, developed greater flexibility in organization after the Brittany operation. No regular assignments were made, and each combat command became a striking force that varied in strength from one to six battalions, depending upon the tactical mission and its constraints. In order to make the flexibility work, Grow made sure that the three combat command commanders worked under the same operational procedures and were equally well acquainted with all the battalion commanders. Though both systems proved successful, the flexibility inherent in the 6th AD provided for a more prompt and effective response to the conditions of combat than did the rigid form. The result was that the 6th AD became one of two of Patton's most dependable and effective combat divisions during operations in the ETO.

General Grow realized that there were many differences in the method of organization; however, the 6th AD was the only one in which Chaffee's basic ideas on organization, tactical planning, and operational skills were completely followed. The essence of Chaffee's ideas and Grow's leadership allowed complete flexibility in execution. During exploitation missions, which the 6th AD frequently carried out, it was Grow's established rule that rapid deployment be initiated by a mounted column, followed usually by combined mounted and dismounted action supported by artillery.

To Grow, there was no substitute for battlefield mobility because it allowed the commander to retain the initiative. His early tactical philosophy, which began at the Cavalry School, was the beginning of a background of professional development and judgment that was open to new ideas. This provided mental resilience, allowing him to adapt quickly to changing military circumstances.

Footnotes

Note: The majority of historical information presented above was taken in part from George F. Hofmann, *The Super Sixth. History of the 6th Armored Division in World War II and Its Post-War Association* (Louisville: 6th Armored Division Association, 1975). The copyright is held by the 6th Armored Division Association, Publisher. Permission has been granted.

[1]"Organization and Tactics" in *The Armored Force Command and Center,* Study No. 27, Historical Section, Army Ground Forces, 1946, Record Group 407, National Archives, p. 42; Martin Blumenson, *The Patton Papers, 1940-1945* (Boston: Houghton Mifflin, 1974), pp. 421, 425, 610, 773; Ltr., Patton to Grow, HQ Third United States Army, 25 Apr 45, Grow Files in possession of author; and Hobart (Hap) Gay in Verbatim Record of Trial, Grow Files, p. 240.

The records of the 6th Armored Division are located at the National Archives in the Adjutant General's Files, Record Group 407, Suitland, MD. There are approximately 130 boxes. These documents served in part for Hofmann, *The Super Sixth.* In addition to the numerous documents that were copied from the archives, correspondences from veterans, and other documentation pertaining to the 6th Armored Division's history was placed with the U.S. Army Military History Research Institute (USAMHRI), Carlisle Barracks, Pa. The units' histories prepared shortly after the war are now located in the Patton Museum of Cavalry and Armor, Fort Knox, Ky.

The other armored division that had an outstanding record and considered by Patton one of his best was the 4th.

[2]Author's notes, 14 May 71, Fort Knox, Ky., Grow Files.

[3]Ltr., Grow to author, 26 Jan 73, Grow Files.

[4]Ltr., Grow to author, 19 Feb 72, Grow Files.

[5]Interviews, author with Grow, 5 May 72, 6 May 73, and 27 Aug 73.

[6]Denison, *A History of Cavalry* (London: Macmillan and Co., 2nd ed. 1913), p. 447. Denison, a Canadian, won Czar Alexander II's award in 1877 for producing this best book on the history of cavalry.

[7]Preston, *The Desert Mounted Corps* (London: Constable and Company Ltd., 1921), *passim.*

[8]Ltr., Grow to author, 19 Feb 72, Grow Files.

[9]An interesting life's sketch depicting Grow's role in the development of cavalry mechanization can be found in his "The Ten Lean Years: From the Mechanized Force (1930) to the Armored Force (1940)," Unpublished MS, 1969. Copies of the MS are on file at the USAMHRI and the Patton Museum of Cavalry and Armor, Fort Knox, Ky. In 1987, *ARMOR Magazine* finally produced a four-part edited book-length series of "The Ten Lean Years," which described Grow's account of the cavalry's decline and the creation of the Armored Force. Also see George F. Hofmann, "Tactics vs Technology: The U.S. Cavalry Experience," *ARMOR* (Sep-Oct 1973): pp. 10-14, and Mildred H. Gillie, *Forging the Thunderbolt. A History of the Development of the Armored Force* (Harrisburg, Pa.: The Military Service Publishing Co., 1947), pp. 20-40.

[10]Ltr., Grow to author, 15 Apr 73, Grow Files; "Prelude to Armor" in *The Armored Force Command and Center;* and Grow, "The Role of Armor," *ARMOR* (Jan-Feb 62): pp. 30-31.

[11]"Redesignation of Armored Force" in *The Armored Force Command and Center,* p. 108, and John K. Herr, "Editorial Comment," *Cavalry Journal* (May-Jun 46): pp. 35-40. As late as 1953, retired General Herr nostalgically called for remounting one horse cavalry division. See John K. Herr and Edward S. Wallace, *The Story of the U.S. Cavalry, 1775-1942* (Boston: Little Brown and Company, 1953), pp. 258-259.

[12]"Initial Structure" in *Armored Force Command and Center,* p. 9.

[13]Remarks by General Jacob L. Devers, Ret., 64th Annual Meeting of the United States Armor Association, 30 Jan 53, Fort Knox, Ky., p.12.

[14]Kent Roberts Greenfield, Robert R. Palmer, and Bill I. Wiley, *The Army Ground Forces: The Organization of Ground Combat Troops* (Washington: GPO, 1947), pp. 334-335. McNair's solution to combat German tanks and the blitzkrieg was to develop an antitank doctrine, which by the end of the war proved invalid. See Christopher R. Gabel, *Seek, Strike, and Destroy: U. S. Army Tank Destroyer Doctrine in World War II.* Leavenworth Papers No. 12, Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kan., Sep 85, *passim.*

[15]Ltr., Grow to author, 2 and 19 Feb 72, Grow Files.

[16]Ltr., Grow to Blumenson, 26 Apr 45, USAMHRI, p. 4. In this correspondence Grow comments on Blumenson's manuscript dealing with the Brest campaign that eventually evolved into chapter XX in *Breakout and Pursuit* (Washington: GPO, 1961), pp. 343-347.

[17]Ltr., Grow to Editor of *Military Review,* 12 Sep 45, Grow Files, and Grow, "Mounted Combat: Lessons from the European Theater," *The Cavalry Journal* (Nov-Dec 45): pp. 35-36. The 4th Armored Division, with rare exception, fought with two Combat Commands as striking forces. Interviews with COL Jimmy Leach, USA, Ret.

During World War II, armored divisions went through six reorganizations, however, the establishment of light armored divisions in 1943 was one of the most efficient. This type of organization was employed by the 6th, 4th, and the other armored divisions, with the exception of the 2d and 3d. The Reserve Command was originally intended "as a means of controlling the division reserve while on the march." However, in the European Theater of Operations, armored divisions "habitually utilized the division in three combat commands." See "Organization and Tactics," in *The Armored Force Command and Center,* pp. 29, 35-36.

[18]Ltr. Read to author, 5 Feb 73, USAMHRI.

[19]The methods of operations are covered in Hofmann, *The Super Sixth,* pp. 437-443.

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The Reserve Tank Company Organizational Readiness Exercise

by First Lieutenant John A. Conklin

This past summer our unit, A Company, 1-163d Cav, had the opportunity to be the first combat unit in the Montana National Guard to undergo an Organizational Readiness Exercise or the infamous ORE. On a cold, snowy weekend, our soldiers boarded a C-130 in Butte, Montana, flew 700 miles to Gowen Field, Idaho, and accomplished their mission — they passed their ORE. This article is a Reserve Component perspective of how to train for an ORE, the phases of the ORE, and the implications the ORE may have for the Army.

Training

For a Reserve Component armor unit to succeed during an ORE, the command group is going to have to evaluate the unit training program, training standards, and the actual training.

The training program should be designed as explained in FM 100-25 and FM 101-25. The command cell of the unit should ensure that platoon-level collective tasks are derived from the unit's Mission Essential Task List. These platoon-level tasks should, in turn, be supported by crew-level collective tasks, which in turn are supported by common tasks. The unit will need to ensure that crewmen at each position are assigned appropriate MOS-specific and supporting common tasks. And it is critical that the unit's CS and CSS elements are not left out of this procedure.

The unit command group then needs to ensure that the training schedules focus on required tasks and emphasize the platoon-level tasks, crew-level tasks, and common tasks. I would suggest designing the training schedule to build upon itself, starting with common tasks and then integrating them into crew-level and platoon-level collective tasks later in the training year.

The actual training has to be to the Army's task, condition, and standard, which cannot be compromised and has to be ruthlessly enforced. The training also needs to be conducted by the first-line leader appropriate to the level of training being conducted. This fosters crew integrity, promotes quality of training because it allows the tank commander to train his crew and the platoon leader to train his platoon to the standard he wants, and ensures that the chain of command is always used within the company.

Finally, NCO and officer professional development is a very critical part of training in the Reserve Component armor force. This training will set the standards for the company officers and NCOs in the unit, and develop the cohesiveness and doctrinal knowledge required to fight and accomplish the unit's combat missions. This cohesiveness and knowledge should radiate out into the unit, giving the enlisted man the opportunity to trust the people who will lead them into battle.

I stress the fostering of a fight-and-win mentality during training. The ORE team should be looking for the unit's desire to defend its nation and its ability to do so. If dedication to God, country and duty do not exist in the unit, I feel that the unit will never be of much account.

ORE Phase One: The Compliance Phase

The compliance phase is the first phase of the ORE, and generally takes place on the two days just prior to the ORE IDT weekend.

This phase evaluates the unit's ability to maintain files, records, and equipment to ensure that the unit's equipment and men are ready for deployment. The subcategories of this phase include personnel qualification, personnel records, training management, supply management, maintenance, security, and MOB files/OPWAR plan. Let us look at each of these categories briefly.

- **Personnel qualification.** The major concerns in this category are ensuring the unit's UMR does not contradict soldier personnel files.

- **Training management.** The major item units need to concern themselves with in this category is designing training by the cross-walk procedure I will mention in this article under training.

- **Supply management.** Units need to ensure that all equipment is registered on the unit's property book, that there is no excess MTOE/CTA equipment on the property book, and that hand receipts are in accordance with Army regulations.

- **Maintenance.** This is a very difficult area in the Reserve Components. Unlike our active duty counterparts, our vehicles are in three different locations and we are not the only unit that uses them. Therefore, ensuring all company vehicles are in operating condition is extremely difficult, especially when your tanks are stored up to 800 miles apart and in two different states! These conditions do make any maintenance evaluation miserable, but there are areas Reserve units can control. DD Forms 314 need to be filled out properly. Unit executive officers have to take responsibility and supervise the DA Forms 348, 2404, 1970, etc. to ensure these are being filled out correctly, stored and used in accordance with update 13, and that the chain of command is being used. This will take a lot of time which, in all likelihood, you will not be paid for, but it must be done.

- **Security.** The important factor in this category is ensuring that all positions requiring security clearances are identified on the UMR in accordance with FORSCOM Regulation 300-3-5, that all soldiers have the required security clearance, and that all security clearances can be confirmed.

- **MOB Files/OPWAR Plan.** Units need to ensure that they have viable, approved movement plans, working load plans for all vehicles, current alert rosters, and properly forecasted class I, III, and V.

Phase Two: The Training Phase

The second phase of the ORE is the part of the exercise that evaluates the soldiers' and crews' level of training within the company. This phase includes the APFT, CTT, weapons qualification, and PMCS. Before we discuss each of these in detail, I would like to take the time to explain what the ORE IDT entailed up to this phase and describe this phase.

As soon as Company A reached Gowen Field, Idaho, we immediately received the mission for the third phase. During the night we set in motion the troop-leading procedures to prepare for the third phase mission. While the officers and HQ personnel worked on this, the platoon sergeants began to organize training for CTT and made sure the soldiers identified to take the APFT got some rest. The crews identified for tank gunnery (which was TT VIII on an M-COFT) practiced engagements and wrote down all engagements on three by five cards, which we always use. During the second phase, we had soldiers all over post! It is a credit to the company's NCOs that all the soldiers were at MATES forward in the Idaho desert by noon, preparing for phase three. Now, let us discuss the individual areas of the second phase.

- **APFT.** This is another trouble area for the Reserve Component. Our company is lucky in that many of its soldiers are very active in the outdoors. Many are mountain climbers, fanatical skiers, rock climbers, and runners (many run 20 K runs on most weekends), so we do not have many APFT problems. However, we also use our physical training time to teach our soldiers how to eat, stretch, and work out properly, instead of doing the regular physical training an Active Component unit would perform. This does not mean we don't work out. It means we train our soldiers how to work out and stay healthy while we exercise. During every IDT, the unit master of fitness trainer needs to identify soldiers who need remedial physical training, take them aside, set up workout goals and a personal training plan. If your unit does train in this manner, I feel that this should not be an area of concern during the ORE.

- **CTT.** To pass this area, unit NCOs must ensure their soldiers train on the tasks the night before. This is not cheating; it is simply training your soldiers to succeed. Remember, these soldiers probably have looked at these tasks only two or three times since the last drill. The rest of the month they have worked another job (or two, or three in many cases!) and dealt with their families.

- **Weapons Qualification.** Small arms qualification has never been a problem in our unit, but our crew-served weapons crews always have a tough time qualifying. As an armor company, the ORE tested our unit's ability to operate the tank firing systems and hit targets with it — not small arms qualification. This was achieved by firing TT VIII on the M-COFT. I feel that, given the Reserve Component's limited training time and limited equipment availability, this may always be a problem. Units still need the resources to maximize the benefits of home-station training.

- **PMCS.** This section of the ORE evaluates the unit's ability to perform PMCS to the -10 standard. It is imperative that all PMCS training is conducted with the -10 out, open, and in use by the crews while they perform PMCS. All leaders, especially the XO and motor sergeant, must always supervise the PMCS training. If training is conducted in this manner, this section of the ORE will not be a problem.

Phase Three: Collective Training

The collective phase tests whether a unit can perform its METL tasks. It is imperative that all personnel involved understand that this is evaluated at platoon level in the Reserve Component. This may seem somewhat strange — the company performs the mission, but is evaluated at platoon level. The commander has to ensure that the company is not given a NO GO in an area because something was wrong at the company level! This does make sense if one looks at the current policy of training at the platoon level in the Reserve Component.

To train for this phase, I would suggest enforcing the troop-leading procedures, METT-T for mission analysis, and ACOKA for terrain analysis. This can be performed in training using a variety of tools that the Army or your creativeness provides to the unit. Our unit has made good use of the mobile platoon SIMNET, Fire Command Plus Exercise, walk-throughs, realistic training at a local training area, and a sandtable with micro armor that the unit members bought and built. All of these can be great training tools if the planning is conducted in a realistic manner and doctrine is studied and reviewed during AARs. I feel that if the unit trains this way, it should pass the ORE.

During the mission the unit will be expected to perform everything it will need to perform in combat. These should be: draw, load and PMCS equipment in a staging area; road march; execute an AA; execute a forward passage of lines; perform a movement to contact; hasty attack; and defend an objective. The unit will have to do these to the ARTEP standards, which means that the unit leaders need to ensure all leaders' tasks are met. Our unit's command cell carries a library of manuals and regulations into the field, to include company TSOP, battalion TSOP, FM 17-15, FM 71-1, FM 17-12-1, FM 17-12-2, ARTEP 71-1, FM 100-5, FM 100-25 and FM 101-25. They are often read and referred to, and I would suggest that if you do not do this now, you should start immediately. This library will allow your soldiers to identify the standard and the concept of training. With this knowledge and some determination, the unit should be able to train in a positive and professional manner.

If the unit understands doctrine, unit TSOPs, tactical planning, ARTEP standards and how to perform as a tactical unit, then the unit will pass. I wouldn't expect to pass everything because of lack of training but to pass this phase is not unreasonable.

Changes the ORE Will Have on the Army

In the future, I expect that the Army is going to be forced to integrate and use the Reserve Component intimately. I am convinced the ORE is a step in the right direction in doing so. However, all of us have a long way to go. When integration does fully occur, I feel the ORE and unit capabilities has and will show that the following criteria have to be attained uncompromisingly in the Reserve Component:

WARNING: To those readers who have weak veins, arteries or heart problems please sit down. All readers must understand what I am about to say is cloud-forming, water-parting, ground-shaking — ideas many readers

Continued on Page 25

Rest for the Weary

The Role of Sleep Management in Combat Operations

by Captain Patrick J. Chaisson

No human being knows how sweet sleep is but a soldier.

— John Singleton Mosby[1]

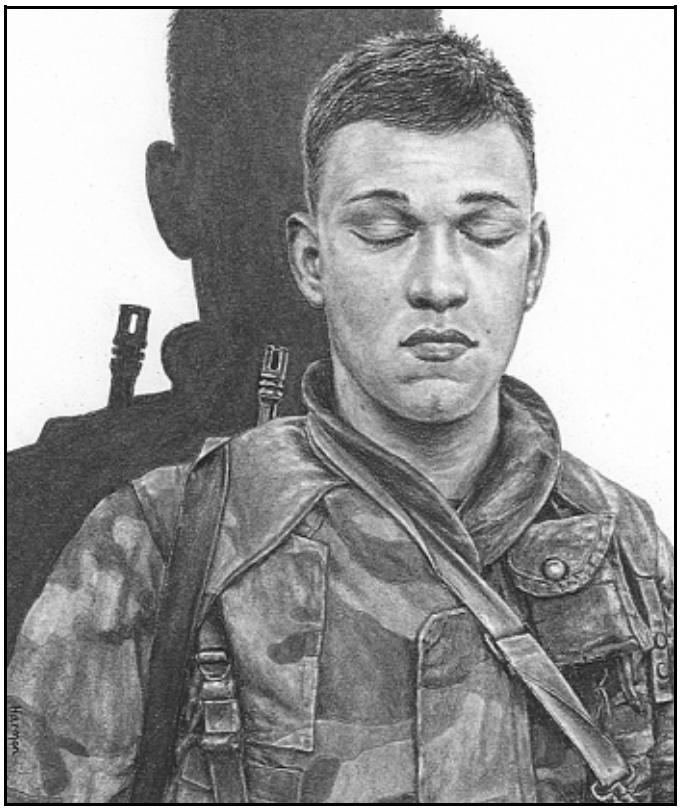
As most readers of Armor can attest, sleep in the field is a rare commodity. In even shorter supply is the knowledge and ability necessary for units to operate continuously without exhausting their troops. Consider the following fictional scenario:

War flares again in distant lands. Task Force Buzzsaw, part of the Rapid Deployment Force, is airlifted from its Stateside base to Southwest Asia. The flight is 17 hours long and crosses nine time zones, but excitement and anxiety keep most from sleeping. Upon arrival in country, the tankers and infantrymen immediately fall in on prepositioned fighting vehicles while TF battle staff personnel begin hurried preparations for a road march to attack positions.

MAJ Eisen, TF S3, blinks back sleep as he examines possible routes forward. In his haste to finish the overlay, MAJ Eisen fails to mark an important road junction with a checkpoint control measure. There's no time to double-check his overlay, for the OPORD is due to begin in five minutes and graphics must be ready right now.

Meanwhile, TF personnel are sluggishly finishing their prep-for-combat checks before moving out. Though the morning sun is already blazing hot, the soldiers' bodies tell them it's still nighttime. Tank commanders, worn out and irritable, forget to make sure their crews are drinking water. The first heat casualties begin to occur.

By the time the tanks start rolling, the task force has been without rest for over 48 hours. On the road march out, a Bradley driver falls asleep at his controls, plunging his vehicle over a cliff. All aboard are killed or badly injured.



Then real disaster strikes. A young platoon leader, bewildered by stress, fatigue and the featureless terrain around him, makes a wrong turn at the critical crossroads. The rest of the task force follows his tank directly into a dug-in regiment of enemy armor. The annihilation is total.

Army trainers examine the results of this disaster and finally rally support for sleep management programs behind the slogan "No More Task Force Buzzsaws!"

Future battlefields "are likely to be chaotic, intense, and highly destructive" places.[2] New technologies, combined with adoption of the AirLand Battle doctrine, have greatly increased the tempo of modern warfare. Advances in target acquisition, communications and sensor systems mean our forces can fight longer, harder, and faster than ever before. The U.S.-led coalition proved how deadly this combination can be when it crushed Iraq's military forces after a 100-hour ground campaign in 1991.

The relatively short duration of recent operations such as DESERT STORM or the 1989 invasion of Panama can be deceiving, however. There is no guarantee that the next conflict involving American troops will be equally brief. It remains imperative that units continue to train for extended periods of time.

Army doctrine recognizes this need. FM 22-9, *Soldier Performance in Continuous Operations*, defines two distinct stages of combat with respect to sleep management:[3]

Continuous Operations (CONOPS). Combat continuing at high-intensity levels for extended periods. Individuals within a unit may have some opportunity for sleep, though this sleep may be brief or fragmented.

Sustained Operations (SUSOPS). Unrelenting combat where soldiers have little or no opportunity for sleep. Within any CONOPS there are likely to be periods of SUSOPS.

Units practice CONOPS and SUSOPS regularly at Combined Arms Training Centers like the NTC or JRTC. Unfortunately, the average Active Duty heavy maneuver battalion rotates to NTC only once every three years. Reserve Component forces get to experience the pressures of prolonged combat operations even less often. The average two-week Annual Training tour might leave six days of field time once time is set aside for travel, equipment draw/turn-in and maintenance activities. Therefore, the experience level of our soldiers, leaders, and planners regarding sleep-deprivation and its countermeasures is not where it should be.

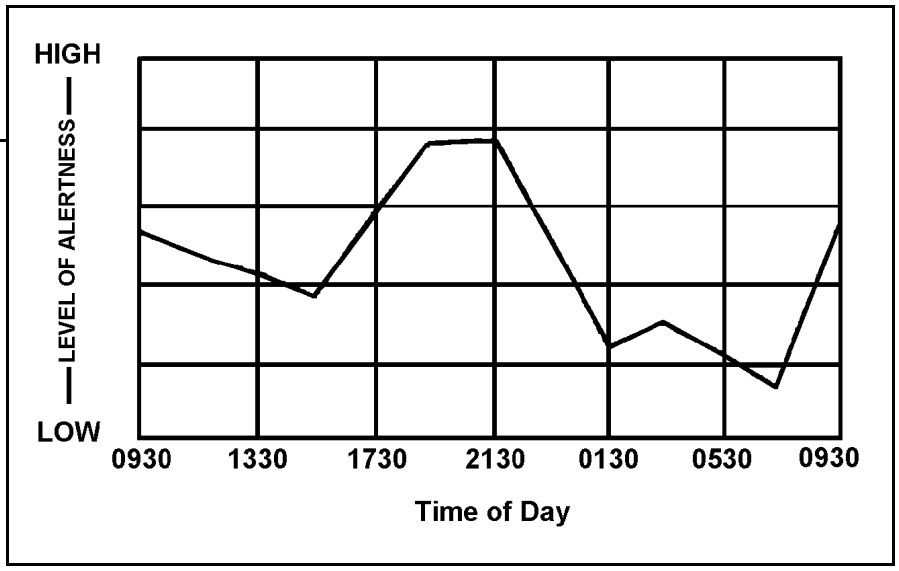


Figure 1. Circadian Cycle from CACDA, Continuous Operations Study (CONOPS).

Scaling the Wall of Sleep

What is the body's reaction to sleep loss? More important, how can leaders maintain their soldiers' ability to fight when forced to operate for long periods without rest? Before we can address these questions, a few words are necessary about the nature of sleep.

The Circadian Cycle. Humans operate on an "internal clock," known as the Circadian or Diurnal Cycle, that influences behavior such as the desire to sleep.

Since most people are used to working during the day and sleeping at night, performance tends to be lowest from 0300-0700.[4] It is during this "Circadian Trough" that alertness most suffers, as any TOC night-shift veteran can attest. (See Figure 1)

Jet Lag. This occurs when individuals rapidly cross time zones. Their circadian cycles are not in synch with the actual time, leading to low energy, sleepiness during the day, and poor job performance. One study indicates that jet lag can reduce total unit effectiveness by up to 15 percent.[5] Those who expect to begin combat operations immediately after deployment should pay heed to these findings.

Sleep Inertia. Humans normally awaken gradually. The state of disorientation and sluggishness upon arousal is called sleep inertia, and usually lasts 5-15 minutes. Personnel who have just risen will not be fully alert, so leaders must consider sleep inertia in deciding when and for how long troops may sleep.

Sleep Deprivation. Just how long can individuals go without sleep? British studies found that a platoon of light infantry kept alert with no opportunity for rest becomes militarily ineffective after only three days.[6] Certain tasks degrade more quickly than others, with mental functions affected most by sleep deprivation.

Experiments conducted by the Walter Reed Army Institute of Research concluded that soldiers receiving six to eight hours of sleep nightly can function indefinitely. Four to five hours of sleep will maintain acceptable levels of performance for five to six days. However, less than four hours leads to a rapid decline in performance, rendering individuals ineffective in two to three days.[7] Thus, if soldiers go without rest for more than three days, or get less than four hours of sleep a night, they are in real danger of collapse after the first 72 hours of CONOPS.

Sleep loss is cumulative. Soldiers may possess a sleep debt even after several hours' sleep. If an individual receives five hours of sleep on one night but only two the night before, he is still sleep-deficient and must get more rest.

We must note here that people respond to sleep deprivation in very different ways. Some soldiers' performance may degrade significantly after as little as 18 hours awake. On the other hand, we have all heard stories of that crusty old first sergeant who could seemingly go without sleep for a week, provided he had his coffee and cigarettes. Other factors, such as climate, MOPP level, and even age also may affect the individual's tolerance to sleep loss.

The Effects of Sleep Deprivation

Officers and NCOs need to recognize the physical signs of serious sleep loss. Among these symptoms are the following:[8]

- Vacant stare - "glazed" eyes (the classic "1000-meter stare")
- Blood-shot eyes
- Pale skin
- Body sways upon standing; sudden dropping of chin upon sitting
- Walking into obstacles and ditches
- Poor personal hygiene
- Very slow heart rate
- Loss of interest in surroundings
- Slurred speech

As mentioned before, sleep deprivation takes its heaviest toll on the mind's ability to process and evaluate information. Those most affected by sleep deficiency, then, are soldiers who think for a living — fire direction center crews, radar operators, leaders at all levels. See Figure 2 for a summary of effects.

Mood and Motivational Changes. Insufficient sleep can cause unit members to feel less energetic, less alert, more irritable, increasingly negative

Effects on Mental Processes	Tasks More Adversely Affected
Lack of concentration	Sustained
Lapses of attention	Unstimulating
Reduced vigilance	Work-paced activity
Slowing of action	Surveillance
Impaired short-term memory	Inadequately learned
Loss of insight	High workload
Misinterpretation	Complex decision-making
Visual illusions	
Disorientation	
Mood Effects	**Countermeasures**
Fatigue	Rest periods
Depression	Short naps
Irritability	Shorter work periods
Loss of interest in surroundings and events	Rotation of duties
	High state of training
Increasingly dominating desire to sleep	Realistic training
	Mental stimulation
	Cross-checking
	Clear and simple orders
	Written instructions

UK's Army Personnel Research Establishment, 1986

Figure 2: Effects of Sleep Deprivation

and sleepy. Prolonged sleep loss will see a shift from negativism and irritability to a sense of dullness and weariness.

Impaired Attention. Soldiers' attention spans shorten as they continue to go without sleep. Vigilance decreases rapidly, resulting in the individual missing or misidentifying critical signals.

Short-term Memory Loss. Those who are experiencing sleep loss find they cannot recall what they just saw, heard, or read. This makes it difficult (if not impossible) to learn new information, follow instructions or remember recent decisions.

Failed Verbal Communication. Weariness, impatience, and limited attention spans can cause conversations to wander. The sleep-deficient individual has difficulty understanding or articulating messages. He frequently misinterprets information.

Lack of Insight. A sleep-deprived person often is unaware that his performance is inadequate. He may think he is doing his job well, and angrily denies criticism of his poor work. Judgment and self-awareness suffer. This false sense of self-confidence is increased when units repeatedly use the same scenarios and terrain in their training exercises.

Safety. Tired soldiers make careless mistakes. They seek shortcuts to proper procedures or skip them altogether. Lack of initiative caused by fatigue keeps leaders from checking their troops' work. After 72 hours without sleep, accident rates increase by 50 percent.

Impaired Task Performance. Uninteresting, repetitive, or complex tasks are seriously affected by sleep loss. The ability to encode and decode information becomes severely degraded. Soldiers need more time to perform cognitive tasks, like plotting grid coordinates. Individuals have difficulty reasoning logically and respond more slowly to changing conditions. They seem as if in a daze.

Other Symptoms. Some people may experience visual hallucinations after extended sleeplessness. Others begin to neglect such routines as changing socks or filling canteens when water is available. Personal hygiene deteriorates in sleep-deficient units.[9]

Historical Perspectives

The crippling effects of sleep deprivation can be made clearer through a few historical examples. In *The Heights of Courage*, Israeli Brigadier General Avigdor Kahalani describes one incident that occurred during the 1973 Yom Kippur War. He had fallen asleep next to his tank's exhaust pipe and awoke the next morning with third-degree burns on his thigh. Kahalani's exhaustion was so complete that he never felt the heat blistering his skin.[10]

When combined with other combat stresses, lack of sleep can ruin a unit in short order. While fighting on New Georgia in 1943, the U.S. 169th Infantry Regiment "cracked" after enduring three days and nights of relentless harassment by a handful of Japanese infiltrators. Unit members shot and grenaded each other in alarming numbers until the regiment was finally judged combat-ineffective and sent to the rear for a rest. Sleeplessness also contributed to the evacuation of 360 troops from the New Georgia theater on July 10, 1943, due to "war nerves" — or combat fatigue.[11]

Leaders are especially vulnerable to fatigue, as is evident in this example from the American Civil War. During the Bermuda Hundred campaign of May 1864, Confederate Major General Chase Whiting discovered a prime opportunity to strike the rear guard of Major General Benjamin Butler's Army of the James as it opened the Battle of Drewry's Bluff. Whiting's force of 5,300 veterans found itself opposed by just two understrength Federal regiments, yet the Rebel general failed to press his attack and crush the enemy. Observers thought Whiting was drunk; in reality he had not slept for three days and was unable to think clearly enough to assess the situation correctly.[12]

Implementing a Sleep Management Plan

Sleep discipline used to mean going without sleep for as long as possible.[13] Research has proved this theory obsolete, as has experience at training centers such as the NTC. We now realize that humans need sufficient sleep if they are to remain effective in combat.

Sleep management plans are especially critical for those involved in command and control functions, namely leaders. In a combat maneuver

battalion, the sleep needs of scout and support platoon members also require close attention. These elements' small size in relation to their mission often means inadequate opportunity for rest during CONOPS.

An effective sleep management plan begins well in advance of the operation. The following hints can be used in preparing soldiers for CONOPS/ SUSOPS as well as maintaining their ability to fight once deployed.[14]

Pre-Deployment Phase: Units should train on complex tasks to the point of "over-learning." If responses become almost automatic, they are more resistant to stressful, fatiguing conditions. Cross-train personnel to take over other crew members' tasks; rotation can give some troops a rest.

A high degree of physical fitness will lessen the feelings of fatigue associated with sleep deprivation. Exercising frequently-used muscle groups is especially helpful. Thus, tank loaders should develop the upper body while infantrymen need to march with packs frequently.

In general, the higher the state of training prior to sleep loss, the longer performance deterioration can be staved off (but it is still difficult to go beyond 2-3 days without sleep). Training for extended, intensive periods allows personnel to recognize the effects of sleep loss and their response to it. However, an individual's tolerance of sleep deprivation cannot be increased by keeping that person awake.

Troops must learn to sleep in MOPP IV if operations in a chemical environment are likely. When soldiers practice sleeping in such unusual conditions prior to deployment, the experience will reduce stress. Personnel who expect to work mostly at night should convert to a night-work/day-sleep schedule (relative to the destination time zone) for some time before departure.

Although sleep can not be stored up, unit members should rest as much as possible before deployment. While this is typically a time of intense preparation, the alternative is to arrive in a combat zone already exhausted.

Deployment/Pre-combat Phases: Sleep quality can be reduced during the deployment phase by time pressures, traveling in uncomfortable vehicles and changes in time zone and climate. Adopt a sleep plan and follow it as closely as possible so soldiers remain fully combat effective.

When a delay of several days exists between arrival and actual combat, personnel can adjust to the new time zone of their surroundings. If there is no delay, it may be best to stay with the work/sleep-rest pattern of the home station. In that case, unit members will not try to adjust their circadian rhythms to local time. They may be sleeping during the day and working at night.

Combat Phase: The purpose of sleep management is to avoid a situation where all personnel are physically and mentally exhausted at the same time. Ideally, every soldier should get 6-8 hours of uninterrupted sleep a night. Operational demands will certainly reduce this figure. There are, however, ways to counter the degrading effects of sleep loss on unit members.

The first and most obvious countermeasure is napping. Soldiers should take naps at every opportunity, as even ten minutes' sleep may restore alertness for a time. Leaders must nap, setting the example for their troops. Keep in mind that individuals need more sleep if they get it by napping than if the sleep is uninterrupted. Also be aware of the risk of sleep inertia when soldiers nap during lulls in combat.

Some people work better at night. Consider their preferences when making shift schedules. Others can take sleep loss in stride for long periods. The use of backup personnel and the Second in Command (2IC) concept is essential in CONOPS. Key leaders need a chance to rest.

As sleep deprivation progresses, allow more time to accomplish tasks. Take care to make communications clear and simple. Make a habit of repeating back verbal orders. When possible, have a second person check decisions and calculations for accuracy and completeness. Soldiers should take breaks from their duties or rotate jobs. Mild physical activity (for example, walking around) can temporarily relieve fatigue from sleep loss.

To maintain CONOPS capability, proper nutrition and water discipline is essential. Hungry, dehydrated soldiers tire more easily. The same is true of personal hygiene. Leaders must make sure their troops maintain good personal habits to ward off disease and preserve morale.

Post-combat Phase: The only remedy for sleep loss is sleep. Rest is not the same as sleep. Immediately following a period of SUSOPS give soldiers an opportunity to "sleep off" their deficit. Figure 3 shows what is necessary to fully recuperate from the effects of sleep deprivation.

Soldiers recovering from long periods of sleeplessness should not be awakened until they have received adequate rest. Otherwise, low performance will result. Not everyone requires the same amount of recovery sleep. Some troops' restlessness may keep others from getting the rest they

Cumulative Hours of Sleep Loss	Usual Sleep/Rest	Minimum Restorative Sleep/Rest Requirement
Day 1 - 24 hrs	8 hrs	4 hrs
Day 2 - 48 hrs	16 hrs	8 hrs
Day 3 - 72 hrs	24 hrs	12 hrs (10 sleep, 2 rest)

FM 22-9, Soldier Performance in Continuous Operations, 1991

Figure 3: Recovery Time

"...remember that the ultimate objective of sleep management is to let us fight smarter so we can fight harder."

need. Make soldiers aware of their fellow unit members' sleep needs and avoid awakening them unnecessarily.

Sleep inertia will usually follow this recovery sleep, especially if personnel are allowed to sleep for more than ten hours. Commanders must consider this side-effect if troops need to be ready for combat on short notice.[15]

The Role of Drugs

Soldiers receive mixed messages about the use of drugs to sustain alertness. For years, drill sergeants have warned recruits that those who take pep pills will "crash" once the effects of those stimulants wear off. Yet what command post is complete without a coffee-maker constantly brewing?

Coffee and other warming beverages can raise morale and improve short-term alertness. Using over-the-counter drugs to counteract sleep loss, however, will lead to rebound fatigue and impaired judgment. German *fallschirmjager* (paratroops) discovered this when they took benzedrine, a stimulant, to stay awake during sustained operations on the Eastern Front in World War II.[16]

Laboratory studies of drugs that help maintain alertness during SUSOPS are currently underway. Also in development is a short-acting sleep-inducing drug for use during deployments and lulls in combat. This sleep aid will be used in combination with a reawakening drug that allows soldiers to return to full alertness quickly.[17]

Maintaining the Initiative

Effective sleep management is a combat multiplier. A commander who can apply unrelenting pressure to a weary foe will have the advantage. Well-rested, mentally alert soldiers fight better than troops who are exhausted. Sleep management begins with command emphasis — leaders must set the example!

Those who regularly deny themselves sleep in misguided attempts to prove their endurance will fail. The smart field leader recognizes his limitations and those of his men. Techniques such as those described above will allow our maneuver forces to maintain the initiative even after weeks and months of intensive combat. In conclusion, remember that the ultimate objective of sleep management is to let us fight smarter so we can fight harder.

Notes

[1]John S. Mosby in *Warriors' Words,* Peter G. Tsouras, ed. (London: Arms and Armour Press, 1992), p. 171.

[2]Department of the Army, Field Manual 100-5, *Operations* (Washington D.C.: U.S. Government Printing Office, 1986), p. 2.

[3]Department of the Army, Field Manual 22-9, *Soldier Performance in Continuous Operations* (Washington D.C.: U.S. Government Printing Office, 1991), p. v.

[4]Combined Arms Combat Development Development Activity (CACDA), *Continuous Operations Study Final Report* (Fort Leavenworth, Kan.: CACDA, 1987), p. B-1-b-24.

[5]Frederick W. Hegge,)Control of Human Resources," *Study on Human and Biomedical Aspects of the Sustained Operation* (Washington D.C.: Walter Reed Army Institute of Research, 1982).

[6]Army Personnel Research Establishment (APRE), *The Effects of Sleep Loss: A Commander's Guide* (Farnborough, Hants, UK: Army Personnel Research Establishment, 1986), p. 17.

[7]CACDA, p. B-1-b-33.

[8]Paul Naitoh, Carl E. Englund and David H. Ryman, *Sleep Management in Sustained Operations: User's Guide* (San Diego, Calif.: Naval Health Research Center, 1986), p. 13.

[9]Sources used for this section were: Henry L. Thompson, "Sleep Loss and Its Effect in Combat," *Military Review,* September 1983; Gerald P. Krueger, et al., *Strategies for Sustaining Soldier and Unit Performance in Continuous Operations* (Washington D.C.: Walter Reed Army Institute of Research, 1987); Paul Naitoh, *Sleep Management User's Guide for Special Operations Personnel* (San Diego, Calif.: Naval Health Research Center, 1992); Alan L. Moloff, "To Fight, Perchance To Sleep," *U.S. Army Aviation Digest,* March-April 1991; Clinton T. Anderson, *Sleep Deprivation and Its Effect on Combat Effectiveness* (Fort Leavenworth, Kan.: U.S. Army Command and General Staff College, 1988); as well as CACDA (1987), APRE (1986) and FM 22-9 (1991).

[10]Avigdor Kahalani, *The Heights of Courage* (Westport, Conn.: Greenwood Press, 1982), pp. 180-181.

[11]Eric Hammel, Munda Trail (New York: Orion Books, 1989), pp. 94-100.

[12]William Glenn Robertson, *Back Door To Richmond: The Bermuda Hundred Campaign April-June 1864* (Baton Rouge, La.: Louisiana State University Press, 1987), pp. 209-216.

[13]Krueger, p. 10.

[14]Sources used for this section include: Naitoh, et al., *Sleep Management in Sustained Operations: User's Guide* (1986); Anderson, *Sleep Deprivation and its Effect on Combat Effectiveness* (1988); Krueger, *Strategies For Sustaining Soldier and Unit Performance in Continuous Operations* (1987); Thompson, "Sleep Loss and Its Effect in Combat" (1983); Dick Hoey, "Fatigue Management" *The Combat Edge,* September 1992; plus CACDA (1987) and FM 22-9 (1991).

[15]Naitoh, *Sleep Management User's Guide for Special Operations Personnel,* p. 10.

[16]James Lucas, *Storming Eagles: German Airborne Forces in World War Two* (London: Arms and Armour Press, 1988), p. 72.

[17]Krueger, pp. 12-15.

Note: The author wishes to thank Carol L. Chaisson of the 5th Bombardment Wing (Heavy) Library, Minot AFB, N.D., for her invaluable assistance in the preparation of this article.

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Reducing Gun Recoil: Differential Recoil Systems

by Don Loughlin

Introduction

Differential recoil systems, sometimes known as "fire-out-of-battery,"[a] have received more interest in recent years, but have been described in the American literature as something new and basically confined to artillery systems.[1,2] In fact, differential recoil is not new, is not confined to artillery, and has been successfully used in automatic weapons for many years — even though it seems to be "reinvented" every 20 to 30 years.

Firing a weapon on the counterrecoil stroke ("out-of-battery") reduces firing loads because the rearward momentum of the weapon (ordinarily equal to the forward momentum of the projectile and the escaping propellant gases) is also reduced by an amount equal to the forward momentum of the counterrecoiling mass at the instant of firing — a simple application of Newton's third law of motion. This technique has been used for a long time, with various degrees of success, in some large caliber cannons and many automatic weapons.[b] In fact, it is with automatic weapons that differential recoil works best, even those of artillery caliber.

In this article, we'll review a number of weapons using the differential recoil technique, but — with two exceptions — the weapons chosen are those that have been mass-produced, those that contributed the most to the state-of-the-art in weaponry.

Editor's Note:

Lettered superscripts refer to "Notes," pg. 24.

Numbered superscripts refer to "References," pg 24.

Field Artillery: Guns and Howitzers

In pre-WWI Europe, a number of countries and manufacturers developed weapons using the differential recoil principle. In 1910, the Schneider Compagnie designed a field gun using this principle, as did Krupp in its 12-pdr anti-balloon gun.[3] The antiaircraft nature of the Krupp gun was an early application of differential recoil that exploited its most salient advantages: a high rate-of-fire with minimum carriage shock and disturbance.

Differential recoil was used for mountain howitzers by the turn of the century.[3] Some examples included the French Canon de 65M mle 1900[4] or 1906[5], French 75mm Deport 1910,[3] Krupp 75mm M1909,[3] and French 67mm Ducrest 1912.[6] Mountain howitzers are lightweight, area-fire weapons where weight is critical; surely more important than some slight loss of accuracy due to a sliding mass in motion prior to firing. Typically, these guns are designed to break down into mule loads of no more than (very) approximately 100 kg (220 lb) each.

The U.S. M204 105mm Howitzer (Fig. 1) is one of only two examples mentioned in this article of a weapon that was never produced[7]. Type-classified in the mid-70s, it used differential recoil. Unfortunately, there are many in the U.S. who believe that "fire-out-of-battery" came and went with the M204. It didn't!

Automatic Weapons

Automatic weapons, such as submachine guns, machine guns (MG), and automatic cannons, usually fire from the "open bolt" position, and benefit from using differential recoil. Differential recoil not only reduces recoil loads, but it permits the high-rate-of-fire weapon to function more smoothly. This also reduces dispersion in burst fire, because:

- With blowback-operated weapons, the forward moving bolt will fire the primer before the bolt can smash into the barrel and/or receiver, and
- With recoil-operated weapons, the barrel-bolt-barrel extension combination (all locked together, with chambered cartridge) will fire the primer before the combination can smash into the receiver in counterrecoil.

Reduced "kick" is a bonus in both cases above.

When describing the functioning of small-caliber weapons that fire in counterrecoil, the term "advanced primer ignition" is often used in the British and American literature.[8,9] Submachine guns with fixed firing pins represent this type mechanism. The firing pin on the forward moving bolt sets off the primer and propellant charge milliseconds before the bolt can hit the barrel rear.

The term "pre-percussion firing" is used in *The Machine Gun*, Volume I, by Col. George Chinn, USMC.[10] Citations of weapons using pre-percussion firing (differential recoil) in this book are:

- The Kjellman 6.5mm MG, ca. 1908 (Fig. 2). The gun shown in Fig. 2, incidentally, was manufactured by Bofors. (Chinn, Pg. 248).
- The Rheinmetall 13mm Aircraft MG, Model 131. This WWII-era weapon is short recoil-operated. "....This permitted the timing of the firing mechanism whereby the powder charge could be exploded and recoil forces set in a few hundredths of an inch before the fast and heavy moving parts collided with the rear end of the stationary receiver. In high speed weapons, especially, the act of buffing the action on counterrecoil not only ensured longer parts life but gave smoother performance. ...." (Chinn, pp. 458-459).
- The Gazda Aircraft Cannon. Chinn notes that pre-percussion" was used in

Differential Recoil Systems In Both Heavy and Light Weapons

Figure 1. The U.S. M204 105mm howitzer, developed in the mid-'70s, employed the differential recoil principle, but never went into production.
(Photo: U.S. Army, Rock Island Arsenal Museum.)

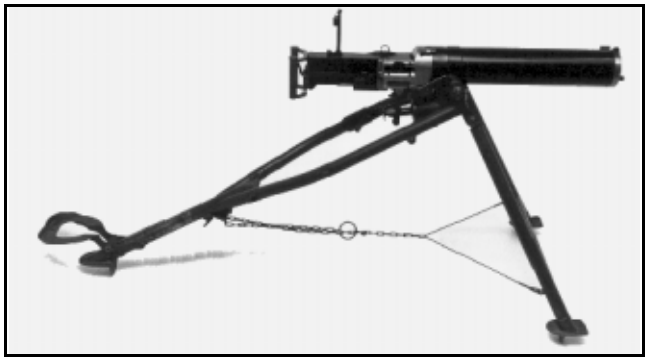
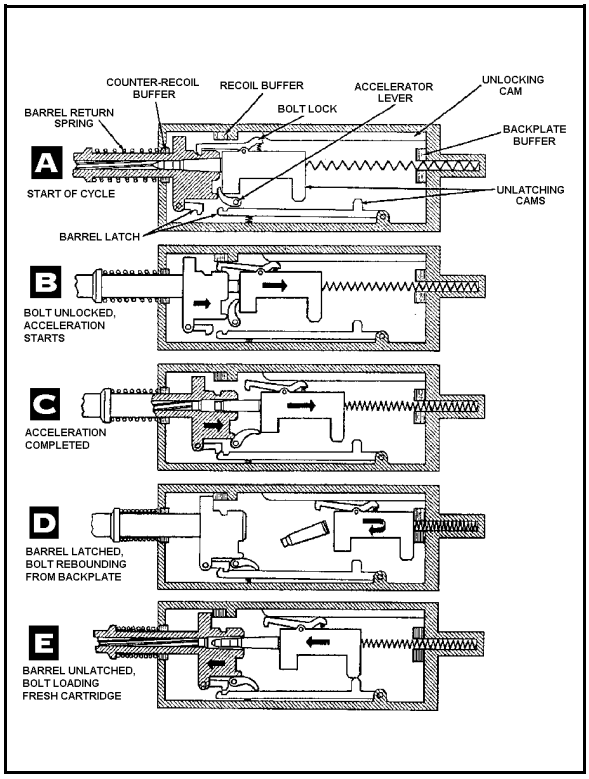


Figure 2. The Kjellman machine gun, developed around 1908, employed the differential recoil principle, firing the 6.5x55mm Swedish rifle round. This gun was built by Bofors, a firm still well known for its automatic weapons.
(Photo: Rolf Hjalmarsson, Eskilstuna Museer, Sweden.)

Figure 4. Schematic below shows the complete short-recoil cycle of a Browning system machine gun.
(Source: U.S. Navy Bureau of Ordnance.)



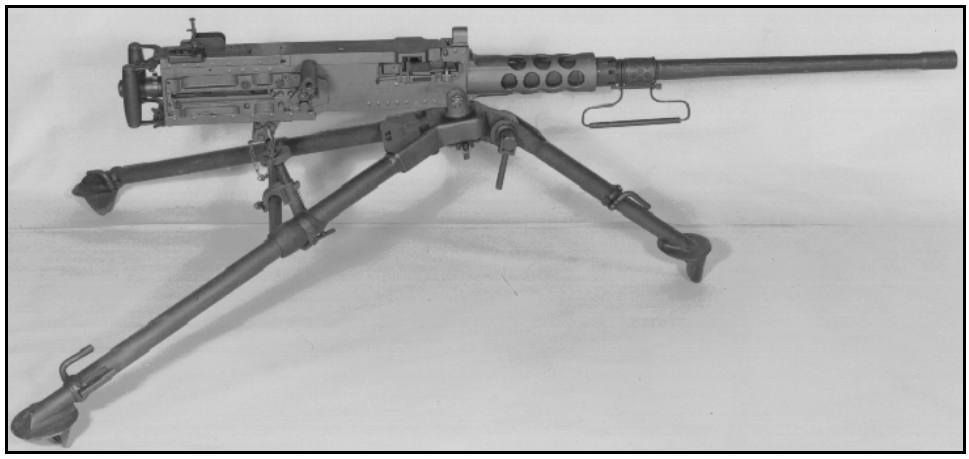


Figure 3. A familiar weapon to armor and cavalry soldiers, the .50 caliber M2 machine gun employs differential recoil. By firing the cartridge just before the barrel and bolt reach their most forward position, the momentum of these heavy moving parts helps equalize the rearward force of recoil.

(Photo: U.S. Army, Rock Island Arsenal Museum.)

"...every Becker and Oerlikon gun made since 1918..." (pp. 519-520).

- The Rheinmetall 30mm MK 108 Cannon[c]. Rheinmetall's *Handbook of Weaponry*[11] uses the term "counterrecoil ignition" to describe this straight blowback-operated weapon. They also refer to the MK 108 as "mass-locked, blowback-operated" (pp. 558-560).

Some weapons that are representative of the differential recoil principle are described in the following paragraphs.

U.S Heavy MG, .50 Cal. M2

It is interesting that Col. Chinn's Volume I omitted from the list that most ubiquitous of all short recoil-operated machine guns, the Browning .30 Cal. and .50 Cal. The .50 Cal. (Fig. 3) is a weapon that has been in production, on and off, for over 70 years. Although he passes over this weapon in Volume I, he makes up for it in Volume IV with this clear description:[12]

"...As the bolt moves forward, its motion is aided by the driving spring. The bolt picks up a fresh cartridge from the feed mechanism and loads this cartridge into the chamber. ...." (See Part E of Fig. 4) "...Just before the bolt locks to the barrel, the barrel is unlatched so that the bolt and barrel move forward into battery while locked together. *Shortly before the recoiling parts reach their most forward position, the firing mechanism is actuated* and a new cycle begins...." (Part A of Fig. 4) *"...Since the cartridge is fired before the counterrecoil motion is completed,* the forward velocity of the recoiling parts is first checked by the initial part of the rearward thrust exerted by the exploding propellant charge and the recoiling parts are then driven to the rear. (Timing the firing in this way eliminates the need for a heavy counterrecoil buffer to absorb the forward kinetic energy of the recoiling parts.)..." (Emphasis added by this author.)

Oerlikon 20mm II SS Gun

A good example of a late-30s Oerlikon blowback-operated gun using differential recoil was the 20mm II SS Gun, widely used in WWII, including service with the U.S. Navy as the Mk 2 and Mk 4 (Fig. 5). Its functioning was a classical use of differential recoil to smooth operation, reduce bolt mass, and reduce operating stresses in a straight blowback-operated weapon. The different phases of the operating cycle are shown in Fig. 6, which are described in the *Oerlikon Pocket-Book*, English language edition,[13] as:

"I. Rearward motion of the bolt is arrested by the bolt buffer and counter-recoil commences.

"II. Counterrecoil of bolt: the cartridge is fed into the chamber.

"III. The cartridge is ignited while the counter-recoil process is still under way. Forward motion of the bolt is slowed down by the increase in pressure in the barrel.

"IV. The bolt is accelerated rearwards by the residual gas pressure and the empty case is extracted. ..."

Bofors Automatic AA Guns

Differential recoil has been used in Bofors AA automatic gun systems since the 1930s in order to obtain a high rate of fire and low dispersion. Representative weapons are: 20mm M43 (1943), 25mm M36 (1936), 40mm L/60 (1936) (Fig. 7 shows a U.S. WWII variant), 40mm L/70 (1948), 57mm L/60 (1954) and 57mm L/70 (1968), and the 120mm single and twin naval guns.

The 40mm L/70, post-WWII successor to the L/60 still used by many countries,

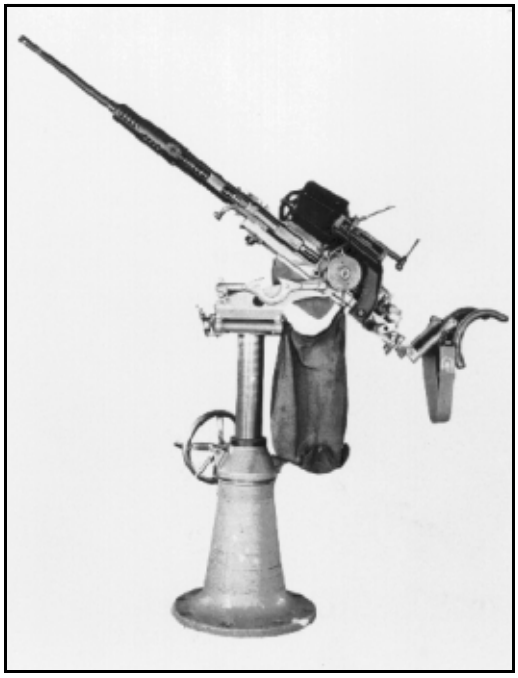


Figure 5. Widely employed by the U.S. Navy in WWII as a shipboard gun, the Oerlikon 20mm II SS, above, uses blowback operation and differential recoil.

Figure 6. Below, the operating cycle of the Oerlikon 20mm II SS automatic cannon.

(Photo and drawing: Oerlikon-Contraves Defence).

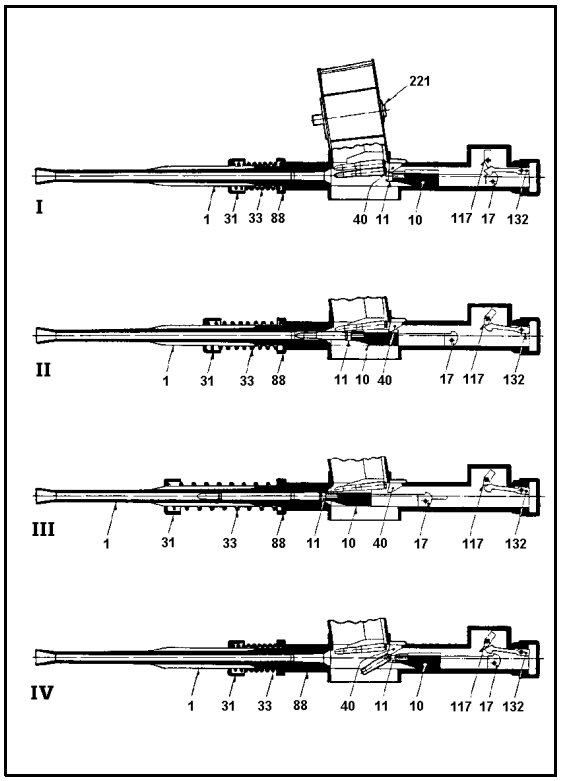


Figure 7. The 40mm L/60 Bofors antiaircraft gun, a 1936 design, saw wide use in many countries. This one, displayed at Aberdeen Proving Ground, is a U.S. Army M1A1 version of the WWII era.
(Author's Photo)

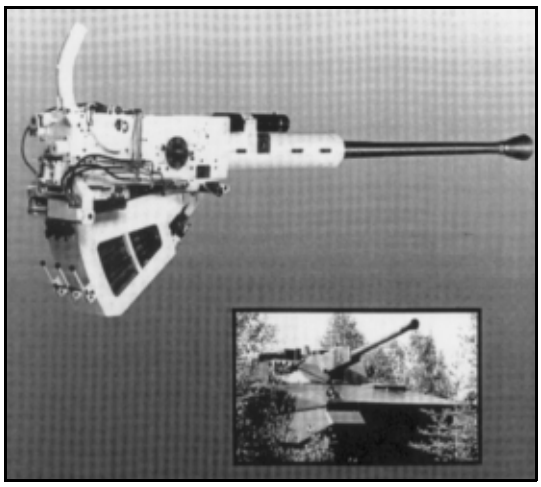


Figure 8. The 40mm L70 is adapted here for use in the Swedish Combat Vehicle CV-90 turret. To reduce turret height, this version feeds from the bottom. Inset shows installation on the vehicle.
(Photo: A.B. Bofors)

was introduced into the Swedish Army in 1951, three years after completion of the original design effort. It is, or has been, manufactured under license by several European countries as well as India and the UK. Fig. 8 shows a Bofors variant of the L/70 adapted for mounting in the CV-90 Combat Vehicle. This particular installation shows the gun mounted inverted: the ammunition feeders are mounted below the gun and the ammunition is fed *upwards* into the gun. This type of mounting has advantages in turrets; keeping the bulk of the ammunition magazine below the gun helps maintain a low turret profile.(14)

Rheinmetall 30mm MK 108 Automatic Cannon

The Maschinenkanone MK 108 (Fig. 9) was developed by Rheinmetall in 1942 for aircraft fixed installation as an air-to-air weapon. As an aircraft weapon to be produced in wartime, some principle design goals were low recoil forces, low weight, and suitable for mass production. Consequently, the design approach chosen was blowback operation for simplicity, combined with differential recoil to reduce recoil forces, and use of sheet metal forming technology to reduce costs for the receiver housing and feeder.

Description of functioning is: After releasing the trigger (Fig. 10, Part A and Part C, Point 1), the bolt moves forward, pushed by the driving springs. On the first part of its travel forward, it operates the feeder by half a step, transporting the fresh cartridge to the barrel axis.

On the second part of its travel, it drives the cartridge out of the link and rams it into the chamber. Before it is completely rammed, the primer is ignited. (Fig. 10, Part B and Part C, Point 2). Note that ignition occurred (at Point 2) while the bolt was still out of battery, but moving forward until it reached the "in battery" position (Part C, Point 3). By the time the bolt is in battery at Point 3, the bolt's direction of travel is reversed by the force resulting from propellant gas pressure in the chamber.

The bolt extracts the empty cartridge out of the chamber and positions it in the link again. On farther travel backward, it operates the feeder again by half a step. Rearward motion is arrested and reversed by the driving springs (together with annular springs as the recoil buffer).

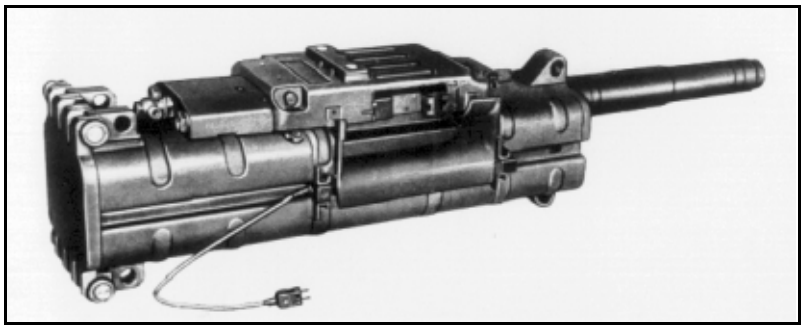
The differential recoil principle was again adapted by Rheinmetall in the 20mm Rh 202, developed in 1963-1968. Fielded in the Bundeswehr and in the armies of other countries, it is a classic recoil-operated (locked breech) weapon using differential recoil to reduce gun internal shocks, reduce recoil loads and to increase accuracy.(15)

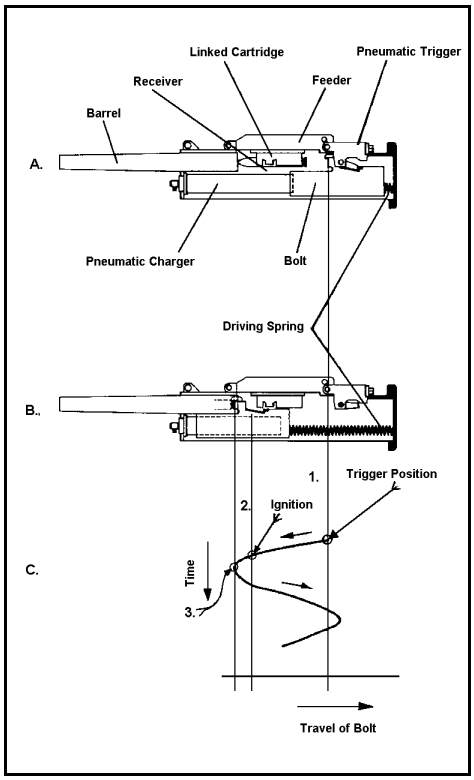
U.S. 30mm M140 Automatic Weapon

The second exception to the general rule of this paper — that only production weapons are considered (the first being the U.S. M240 105mm Howitzer) — is the 30mm M140 Automatic Weapon (Fig. 11). I believe this weapon is a rarity, an externally-powered gun using differential recoil. Originally intended for the AH-56A Cheyenne helicopter, the M140 was designed to produce low recoil loads compatible with the airframe limits and flight stability of helicopter gunships. It was an unusual dynamic mechanism which combined features found in both internally- and externally-powered automatic cannons. For recoil load attenuation, the receiver underwent fore and aft excursion in the stationary cradle/mount (Fig. 12). During operation, rotation of the receiver drum cam caused the barrel to reciprocate inside the receiver.

Fig. 13 is a plan view, schematic diagram which illustrates one gun cycle. The cradle/mount is shown in white; the receiver and buffer tubes are shaded dark gray; the sear mechanism is in black; and the barrel is in white. The action sequence begins at Fig. 13A. At the start of the cycle, the receiver is seared to the rear with the buffer springs compressed. The barrel is in the forward (open) position, and a cartridge is positioned in front of the standing breech.

When the sear is released (Fig. 13B), the receiver *starts* to move, driven forward in the mount by the compressed buffer springs. Simultaneously, the barrel is shuttled to the rear by the drum cam. As the barrel moves to the rear, it





Rheinmetall MK 108 30mm Autocannon

Figure 9. Above, the Rheinmetall 30mm MK 108 automatic cannon was a WWII development for installation on aircraft.

Figure 10. Time-displacement curve for the MK 108 (Part C, at left) illustrates the point at which cartridge ignition occurs (Point 2). The bolt is still moving forward at this point and the weapon has not yet gone into battery. By the time the bolt has reached Point 3 — the in-battery position — chamber pressure is already beginning to reverse the bolt's direction of travel.

(Photo and illustration: Rheinmetall GmbH)

chambers the cartridge which remains seated on the face of the breech block. The round fires (Fig. 13C) while the receiver group is moving forward and the barrel is held to the rear in the closed position by the dwell in the drum cam. The firing impulse reverses the receiver motion, the recoiling receiver compresses the buffer springs (Fig. 13D), and the cam shuttles the barrel forward. The receiver is seared to the rear at the end of its rearward travel.

When the barrel reaches the forward (open) position, the spent case is ejected out the bottom of the receiver as a new cartridge enters the receiver from the top. The cycle then repeats itself until the weapon is shut down.

Type-classified for limited production in August, 1969, the M140 was never put into production. Its only application was the AH-56, and when that program was terminated it decided the fate of the M140.[16]

Problem Applications

Differential recoil has been shown to operate well with automatic weapons, even those of artillery caliber, where its ability to smooth high-rate operation by using existing dynamic forces to cancel out other forces provides superior performance. It has not yet been successfully applied in two areas:

- Weapons with large propellant charges, in particular, those using bag charges ("separate-loading ammunition").
- Weapons needing *very* high accuracy, such as tank guns.

The difficulty with using differential recoil with large propellant charges, particularly bag charges, is that these systems tend not to have the uniform, repeatable ignition times crucial to the close timing needed for differential recoil functioning. With differential recoil, peak pressure must be achieved at a specific point in the counterrecoil of the moving parts (preferably at maximum forward momentum), and if the two do not coincide, the mechanism will be out of synchronization. This results in an increase in shock and stresses, rather than reduction. The fact that howitzers, and most field artillery, use variable propellant charges does not make this problem any easier to solve.

In a tank gun, the problem with using differential recoil is that, with a mass as large as a tank cannon in motion prior to firing, there could be shifts in center-of-gravity and disturbances of axes of barrels and sights which can affect accuracy — an unacceptable tradeoff in a very high accuracy system.

Note that the two above applications are usually *hand-loaded, relatively slow rate-of-fire weapons, as compared to automatic weapons,* demonstrating further that *the payoff with differential recoil is with automatic fire.*

Differential Recoil Terminology

One reason the differential recoil technique is less commonly understood than it should be is that weapons designers use different names for it, depending on the language and preferences of the weapon designers — and whether the application is a submachine gun, machine gun, automatic cannon, or artillery. This may explain why it is periodically "reinvented." Excessive compartmentation of knowledge is not unusual in the technical world, even when the data is not classified.

Previously in this article, I've noted most of the variations in terminology for this principle. The only term not previously noted is "dynamic cradle," found in Bethel's *Modern Artillery in the Field* (1911).[3] What is interesting about this book, other than its early 20th Century perspective, is that it is

also the oldest English-language source found (in the author's limited research) that uses the term "differential recoil."

Conclusions

Differential recoil permits use of forward momentum in the high-rate firing cycle to counteract recoil momentum, thereby smoothing operation, reducing stresses, and permitting a lighter weight and more stable weapon. It has been successfully used in many automatic weapons and deserves the attention of engineers for other applications. Perhaps it would be better understood if we could settle on a common name for it, regardless of the application. How about "differential recoil?" And, *please*, let's not re-invent it!

Notes

(a) "Fire-out-of-battery" has also been called "soft recoil," for obvious reasons. But in recent years, "soft recoil" has also been used to describe the long-recoil systems now being used in some direct fire, turreted applications. Note, however, that differential recoil reduces the total rearward impulse delivered to the system, while long-recoil systems do not. To avoid confusion, "soft recoil" is not used in this article. "Differential recoil" is preferred, a simple and expressive term.

(b) This article does not include other means of reducing recoil which are external to the weapon itself, such as recoil adapters which are placed between the weapon and the mount. It is a different technical principle, and the subject should be treated separately.

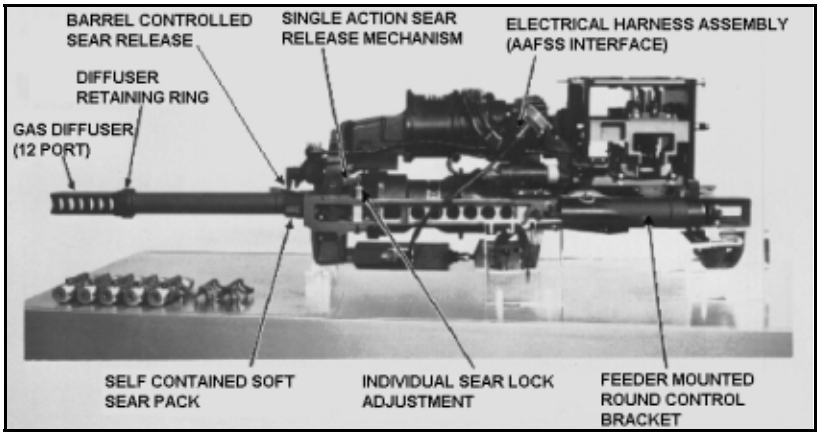
(c) "MK" here is "Maschinen Kanone" (Automatic Cannon), not "Mark" (Mk) for Model Number.

References

(1) Sparklin, Steven E., *Feasibility Study of Soft Recoil (Fire Out of Battery) for Tank Application*. U.S. Army Weapons Command: Armored Weapon Systems Directorate, Weapons Laboratory; Technical Report SWERR TR 72-86. AD 906530. 1972.

(2) Voight, Capt. Suzanne W., "Much Ado About Something", *Field Artillery Journal*. July-August 1986.

(3) Bethel, Col. H. A., *Modern Artillery in the Field*, London: MacMillan and Co., 1911.



The U.S. 30mm M140 Automatic Weapon:

Designed for the ill-fated Cheyenne helicopter, but never produced

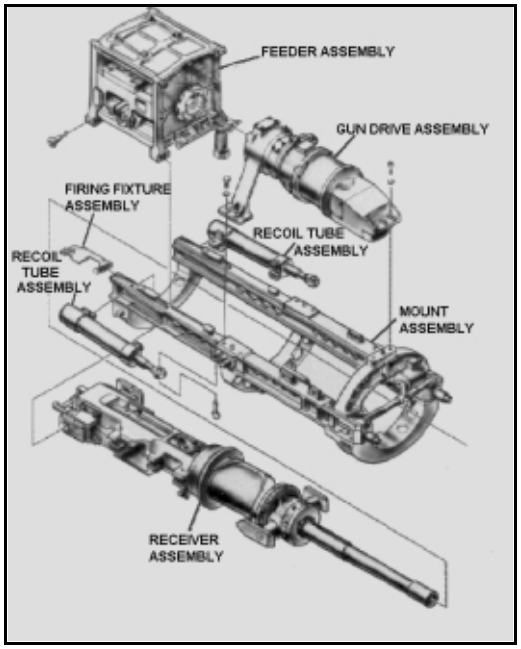


Figure 11. The M140, seen in photo above, was designed for the Cheyenne helicopter, but died when the helicopter project was cancelled. Externally powered, like the Gatling gun or the current Bradley cannon, it was specifically designed for low recoil in its role as a helicopter weapon. Its moving cradle and differential recoil concept helped reduce recoil loading.

Figure 12. At left, the major subassemblies of the M140.

(Photo and illustration: U.S. Army and Ford Aeronutronic Division.)

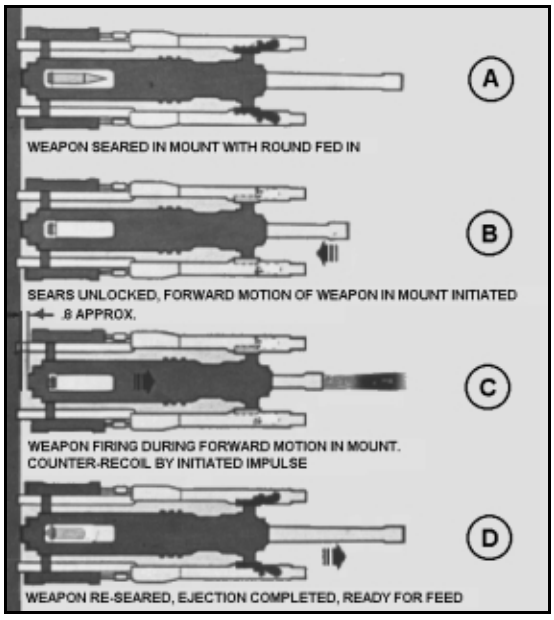


Figure 13. At left, the schematic illustrates the M140 firing cycle.

(U.S. Army Weapons Command)

(4) Gander, F. and P. Chamberlain, *Weapons of the Third Reich.* NY: Doubleday, 1979.

(5) *Weapons and Warfare, The Illustrated Encyclopedia of 20th Century, Volume 18,* N.Y.: Columbia House, 1978.

(6) Ryan, J. W., *Guns, Mortars, & Rockets,* Oxford: Brassey's, 1982.

(7) Bidwell, S. (Editor), *Brassey's Artillery of the World,* NY: Bonanza Books, 1979.

(8) Smith, C.J.M. and P.R. Haslan. *Small Arms & Cannons,* Oxford: Brassey's, 1982.

(9) HQ, U.S. Army Materiel Command: AMC Pamphlet AMCP 706-260, *Engineering Design Handbook, Guns Series, Automatic Weapons.* 1970.

(10) Chinn, George M. *The Machine Gun, Vol. I.* Washington, DC: USN BuOrd, 1951.

(11) Rheinmetall. *Handbook of Weaponry.* Dusseldorf: 1982.

(12) Chinn, George M. *The Machine Gun, Vol. IV.,* Washington, D.C.: USN BuOrd, 1955.

(13) Oerlikon-Buhrle, AG. *Oerlikon Pocket-Book.* Werkzeugmaschinenfabrik, Zurich, 1981.

(14) Personal communication with Mr. Bengt Sjölander, A.B. Bofors, 25 February 1992.

(15) Personal communication with Mr. Edgar Gerndt, Rheinmetall GmbH, 25 May 1992.

(16) Personal communication with Mr. Dean Williams, formerly with Ford Aeronutronic Division, 30 May 1992.

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Any errors are, of course, the responsibility of the author.

Don Loughlin retired from the defense industry in 1992 after a 35-year career as an ordnance engineer. Prior to that, he was a Marine armor officer for five years, a stint he characterizes as "short and undistinguished, but honorable." Loughlin holds degrees from the University of Pennsylvania and Johns Hopkins University and is a 1953 graduate of the Armor School. He lives in Antioch, California.

Reserve O.R.E. (Continued from Page 13)

are not going to like. However, I do feel these suggestions would make our Reserve Component a very professional and lethal force that could be called up within time periods of four weeks.

- To be successful, each company-size unit needs full-time technicians or AGR, a first sergeant, training NCO, motor sergeant, supply sergeant, and company master gunner.

- All Reserve Component soldiers need to have full medical benefits. This is not a benefit for the soldier's sake; it is a benefit which will ensure Reserve Component soldiers stay healthy and do not have health problems when called to serve their country. I don't feel that their families should be entitled to these benefits. Instead, I feel that the Army should develop an inexpensive medical and dental insurance which these soldiers can purchase for their families at little expense for themselves or the Army.

- Reserve Component units should be allotted money to contract with local health clubs to administer physical training to soldiers free of charge. Attendance should be made mandatory and without pay.

- Eleven MUTA-5 training assemblies and an 18-day annual training period should be required yearly. In addition, E5s and above need to attend another MUTA-4 every month to train gunnery, prepare future training events, and attend monthly professional development.

- All company vehicles need to be stored at the unit's location near an operable rail head, so they can train mobilization during every AT, thus reducing call-up time. This would also promote the feeling of crew ownership of vehicles, which seems to be lacking in the Reserve Component.

- Each company-size armor unit will need at least a 500-acre training area. This may be achieved by purchasing private land or incorporating a section of Bureau of Land Management (BLM) or Forest Service land into military training areas.

- Encourage Reserve Component soldiers to attend active duty schools if it is at all possible for them to do so.

- Army and civil leadership need to ensure that Reserve Component soldiers are protected from employer discrimination for participating in the Reserves and that Reservists are given mandatory preferred hiring for government and civilian jobs.

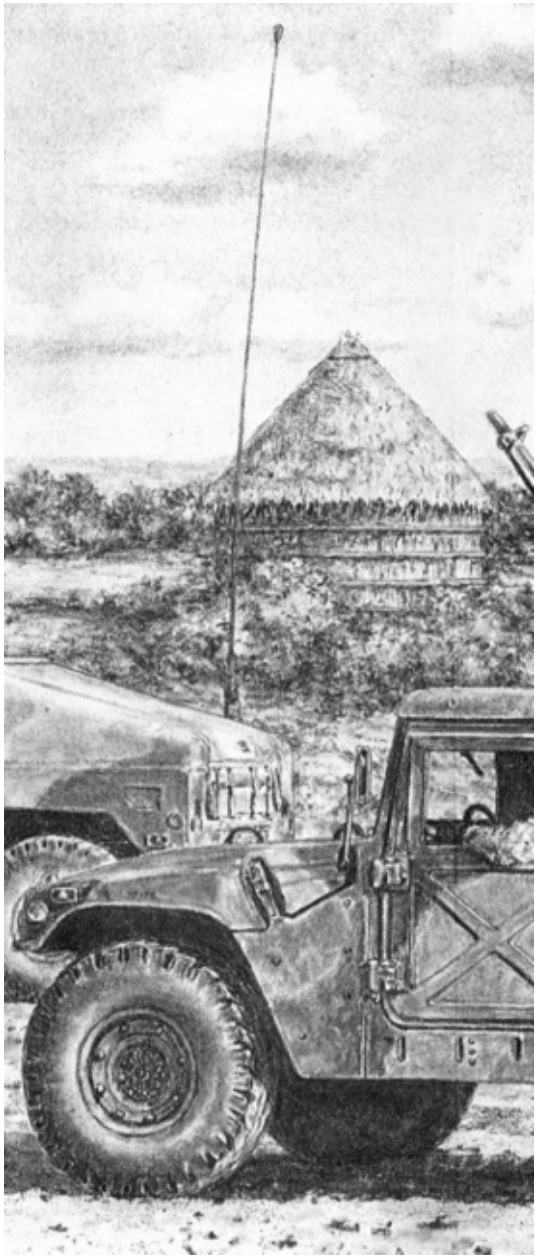
The last thing that the ORE will foster — and this needs to occur —is that we accept each other as soldiers whether we are Reserve or Active Component. We need to genuinely train with, depend on, and develop camaraderie with each other. It would do my heart good to see all soldiers, whether Reserve or Active, standing side by side in defense of our country and its ideals, professionally, tenaciously and — most importantly — together.

First Lieutenant John A. Conklin graduated from basic reconnaissance training, OCS, AOBC, and RCTCC. He is currently attending AOAC at Fort Knox. An honors graduate of Western Montana College with degrees in mathematics and physical science with a minor in chemistry, he is currently the XO of Co A, 1-163 Cav, MTARNG.

The 10th Mountain Division's 3-17 Cav Deploys to Somalia

Peacekeeping With Light Cavalry

by Lawrence G. Vowels and Major Jeffrey R. Witsken



The 10th Mountain Division received notification in late November 1992 that it would provide forces for Operation RESTORE HOPE in Somalia. The 3d Squadron, 17th Cavalry was alerted as part of the initial division forces deployed to Somalia, arriving from early January through May 1993. This was the first time that a light infantry division cavalry squadron deployed on a peacekeeping mission. This article discusses the experiences of 3-17 Cavalry and lessons learned from this operation.

Deployment

When alerted for deployment, A Troop and Squadron HQ were hastily pulled out of field exercises. Preparation for deployment began with country orientations and the units training for what they might encounter. Equipment was prepared for operations in an austere desert-type environment. While units prepared for deployment, the leaders and staff began the task of defining missions, end states, and forces required to deploy. Initial deployment guidance was vague and changed almost daily. Meanwhile, equipment and personnel shortages were rectified. The requirement to develop a task organization that could complete the assigned mission was a difficult chore. Task organization frequently changed prior to deployment, due to lack of a clearly stated mission and ever-changing manpower ceilings, ranging from all of the task force (over 360 personnel) to a low of 180. The need for preparation, planning, and training to take place concurrently presented quite a challenge to the leadership of the squadron. In the end, the unit deployed with only a few problems. But all of the squadron's equipment was shipped before the squadron learned that only 180 would deploy. No clear reasons were provided for the personnel ceiling.

Deploying soldiers received a great deal of deployment training in country briefings, signal procedures, safety, and field sanitation. Tactical classes, terrain board exercises, and situational training exercises refined and rehearsed convoy security, checkpoint operations, mine detection, and disarming civilians. Rules of engagement classes included situational vignettes.

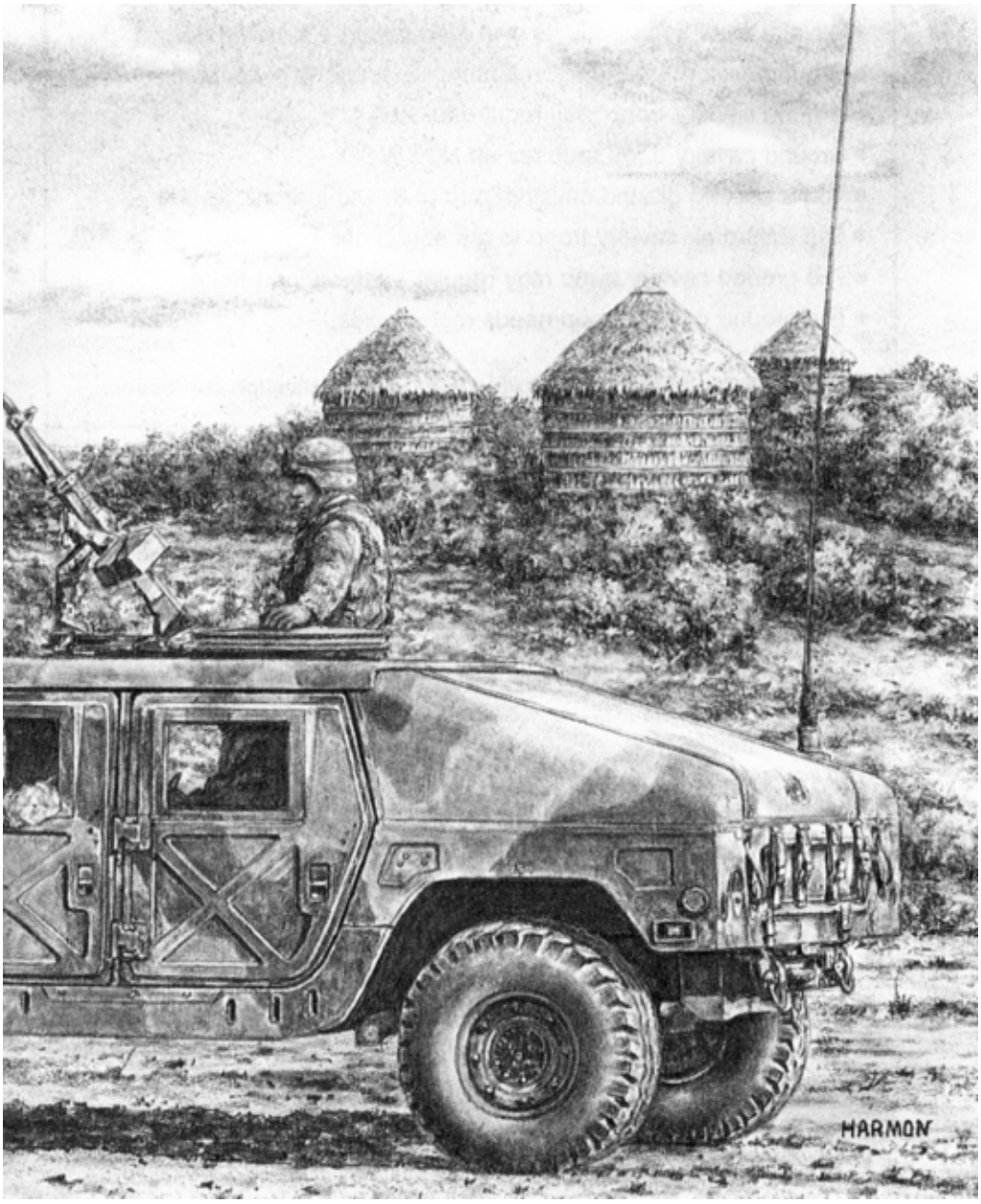
A sudden rush of new equipment reached the squadron just prior to deployment including MK19 machine guns, AN/PSS-12 mine detectors, and global positioning system (GPS) receivers, but pre-deployment training with this new equipment was minimal.

Our deployment to Somalia provided several lessons learned: Expect rapidly changing requirements immediately prior to deployment. Leaders and personnel need to remain flexible and rapidly adapt to the latest guidance. The training that was conducted prior to deployment was extremely useful.

Unit Background

The 3-17 Cavalry is a light cavalry squadron of a light infantry division, also known as the reconnaissance squadron. Activated in the 1986 to 1988 time frame, during the organization of five light infantry divisions, these units represent the first attempt to create rapidly deployable light cavalry. Unfortunately, severe force design constraints limit their capabilities.

Light infantry division design certification began with unit Army Training and Evaluation Programs (ARTEPS), then culminated in a division exercise entitled CELTIC CROSS IV, in August 1986. Although the cavalry squadron was not employed doctrinally, both Armor School and Aviation School subject matter experts stated that the cavalry squadron could not perform its doctrinal missions as structured. The squadron's single



ground troop could only cover a brigade-size front or flank, given its structure. Table 1 summarizes the observations made during light infantry division certification.

After serious official and unofficial debate, the cavalry squadron design was fielded and it remained to unit training and actual operations to further test the design.

Some of the weaknesses noted before and during CELTIC CROSS IV were corrected. Since then, the cumulative experience of the active cavalry squadrons in field exercises, deployments, National Training Center (NTC)/Joint Readiness Training Center (JRTC) rotations, and peacekeeping missions in Panama and Somalia has confirmed that the current cavalry squadron cannot fully accomplish its doctrinal missions for the division as specified in FM 17-95 due to shortcomings in the design. The largest contributor to this inadequacy is the presence of only one ground troop in the squadron.

Area Of Operations

The area in which 3-17 Cavalry operated included almost the entire southwest of Somalia, an area much larger than any the squadron had been able to train in prior to the deployment. A Troop operated primarily on the main supply routes from Baledogle to Mogadishu and from the Afgooye area to the Marka area in the Shebelle River Valley. The air troops operated over the breadth of southern Somalia, from east of Baledogle, to Baidoa, to Bardera, to near the Kenyan border, to Kismayo, to Marka, and to Mogadishu. The assault helicopter unit attached to the task force also flew missions up to Belet Uen.

Task Organization

Squadron - Task force (TF) 3-17 Cavalry (one ground troop, two air troops) deployed with only 180 personnel. B Troop provided the bulk of the Division Ready Brigade (DRB) aviation command and control slice deployed initially to Kismayo. The B Troop soldiers, under command of the squadron S3, became known as Team Bandit.

The team's organization changed throughout Operation RESTORE HOPE, based on the requirements of the next mission. This team initially consisted of the four-aircraft DRB command and control slice. Its strength grew to six OH-58s, four AH-1Fs, ten UH-60s, and well over 100 personnel for some missions.

The squadron (minus) based its operations in Baledogle with the 10th Aviation Brigade. The squadron was usually augmented with a counterintelligence team and interpreters to conduct ground operations. The squadron became the Army Forces aviation headquarters in February when the 10th Aviation Brigade HQ redeployed, assuming attachments of an assault helicopter company, an aviation intermediate maintenance company, an Air Force weather team, and an air traffic control team.

Ground Troop - A Troop deployed with only 42 of its authorized 66 soldiers. While it had all 22 of its assigned vehicles, ultimately only 13 were used once in country. At the

time the vehicles were shipped, the personnel ceilings weren't known. The troop wished to maintain three-man crews on its vehicles, so the remainder were used by other squadron elements or kept as spares.

A Troop was organized into three platoons with both M1025 and M966 high mobility multipurpose wheeled vehicles (HMMWVs). Shown in table 2 is the normal troop vehicle and weapons assignment. The ground troop was routinely supported by a medic team (HMMWV ambulance) and a maintenance contact team (three mechanics in a HMMWV with trailer).

Air Troops - B Troop and C Troop both deployed. As mentioned, the B Troop scout platoon formed the nucleus of the DRB command and control slice deployed to Kismayo. The number of aircraft and crews under each troop varied throughout the deployment as task organization and troop strength were adjusted for all missions.

Two primary lessons were learned from the task organization. First, the unit must remain flexible because the task organization changed with nearly every new mission. Second, the squadron must be prepared to operate as a task force headquarters, accepting aviation and ground elements from many sources.

Squadron Operations

Throughout deployment, squadron operations were characterized by extended communication distances, the need to cover large areas of responsibility, and continuous operations. The squadron was assigned zones to operate in, to allow the light infantry battalions to concentrate in other areas. Because of the large area of operations, robust sustainment and long-range communications were prevalent. The squadron routinely conducted continuous operations to uncover bandits. Whenever possible, ground and air cavalry worked together to facilitate mission accomplishment. The following missions were assigned to TF 3-17 Cavalry elements:

- Area reconnaissance (air and ground)
- Armed reconnaissance (air)
- Convoy escort (air and ground)
- Convoy security (air)
- Raid (air and ground)
- Air assault security (air)
- Air assault (by an attached UH-60 assault company)
- General support aviation
- Show of force
- Quick reaction force
- Force protection

In addition to these missions, the ground cavalry troop frequently conducted "village assessments" to gain intelligence, determine what assistance a village needed, and determine which clan controlled the village. These missions established a strong presence and had a psychological impact on the civilians in the area of operations.

The extended distances required the squadron to continuously maintain two or three command posts. The squadron primary tactical operations center (TOC) and air line of communication (ALOC) were located at the fixed base in Baledogle. This facility was co-located with the 10th Aviation Brigade TOC and the 2d Brigade 10th Mountain Division TOC. A squadron jump TOC supported A Troop area reconnaissance missions. A command and control console UH-60 supported both quick reaction force missions and complex, long range missions. The squadron commander usually commanded from an OH-58 except when accompanying A Troop in a HMMWV.

Mobile subscriber equipment (MSE), the tactical satellite (TACSAT) system, and high frequency (HF) communications were all required to overcome the long distances between elements. TACSAT proved to be more reliable than HF communications, which could not always be established. TACSAT and MSE were the most dependable.

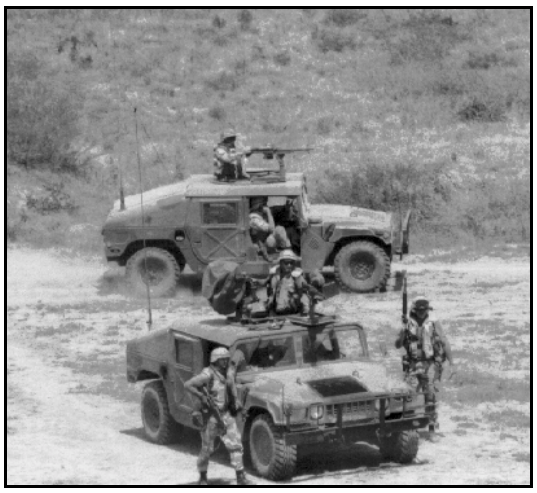
The entire 10th Mountain Division was severely challenged trying to cover its wide area of responsibility. The challenge was particularly acute for the squadron, as it often ranged throughout the division area of operations. Additional air and ground cavalry troops would have permitted sustained continuous operations and added significantly to the squadron's capability.

- Cavalry squadron needs its own fire support element (FSE).
- Ground cavalry troop requires mutually supporting weapons.
- Ground cavalry troop may require an XO.
- Ground cavalry troop requires an NBC NCO.
- Add a second ground cavalry troop to the squadron.
- Add a third air cavalry troop to the squadron.
- The ground cavalry troop may require a fire support team.
- The ground cavalry troop needs motorcycles

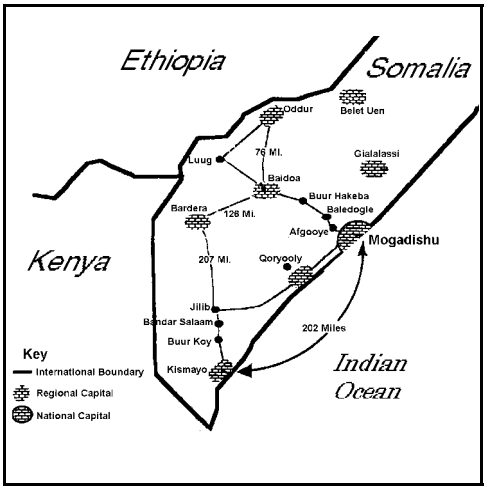
Table 1. Observations made during light infantry division certification.

Troop HQ	**CO (3-man crew) XO (2-man crew) 1SG (2-man crew) Supply Sgt (2-man crew)**	**M1025 (M60) M1025 (MK19) Soft-top HMMWV 5-ton truck w/water trailer**
1st Platoon	**4 vehicles (3-man crews)**	**One M1025 (MK19) One M1025 (.50 cal) Two M966 (TOW/M60s)**
2d Platoon	**4 vehicles (3-man crews)**	**One M1025 (MK19) One M1025 (.50 cal) Two M966 (TOW/M60s)**
3d Platoon	**3 vehicles (3-man crews)**	**One M1025 (MK19) Two M966 (TOW/M60s)**

Table 2. Ground Troop Assignments



Somalia Scenes



The squadron as currently organized has no organic mortars, so it depended on the attack helicopters of the air troop for fire support. But the air troop's support was limited to several daylight hours and several hours at night, due to split-based operations and the long distances between Baledogle and A Troop's area of operations. A mortar section would have been useful to illuminate night operations, to provide reliable, continuous fire support to A Troop while operating far from Baledogle, and for base security.

Air elements worked with A Troop during all ground troop missions. They were invaluable in helping to locate villages that were not on maps, finding routes to villages or across irrigated agricultural areas, covering areas not accessible to HMMWVs, providing security during operations where much of A Troop had to dismount, or where A Troop could not cover all routes in or out of an area to be searched, and to provide fire support on call. FM communications provided the link between air and ground elements.

Due to the split operations, fuel resupply was especially difficult. The squadron does not have an organic support platoon, and the brigade III/V platoon was only equipped with 5-ton tank and pump units. For resupply, the aviation brigade relied on heavy expanded mobility tactical trucks from units in Germany. A large number of convoys were required to build up the bulk supplies of aviation fuel needed at Baledogle. The brigade's class III/V platoon provided outstanding support, but was stretched thin by having to conduct refueling operations at two airfields, as well as in the field. An organic support platoon (equipped with HEMTTs) would have provided the squadron with a more robust and capable fuel resupply.

GPS units in both ground and air elements made location and coordination easy and efficient. They were used on aircraft and ground vehicles (troop commander and platoon leader vehicles only). They worked well, allowing accurate cross-country maneuver, particularly in terrain with no significant landmarks. GPS also allowed units to link up for resupply in vast, featureless areas. GPS saves fuel, flight time, and crew endurance by facilitating reliable point-to-point navigation. GPS should be issued to each scout vehicle.

Junior leaders must be confident and competent to make quick, hard decisions in their dealings with civilians. These decisions had to be made while operating relatively independently and out of communication range with their superiors. Counterintelligence teams and interpreters are critical to the success of reconnaissance operations in this environment, where the best sources are the people. Each scout platoon should have an interpreter.

The cavalry squadron must have reliable long-range communications. The squadron is expected to operate over extremely large areas, and in this instance, the split operations and the great distances between elements strained the capability of the communications available.

Sustainment of operations at two separate locations stretched squadron assets to the maximum. This level of support required intensive maintenance, carefully managed missions, and support of only the highest priority missions.

Troop/Platoon Operations

The ground troop received long-range missions requiring extended operations away from the secure base at Baledogle. The ground troop was nearly always out of range of fire support due to the large areas covered, although air cavalry was usually 10-30 minutes of flight time away. The ground cavalry troop reduced the amount of ammunition and equipment carried in its HMMWVs to maximize space for the extra water and fuel needed for extended range operations. Full basic loads were not carried. The troop traveled with full fuel tanks, 4-5 fuel cans per vehicle, and 4-5 water cans per vehicle. All trucks were sandbagged.

Ground scouts employed binoculars and TOW missile sights during the day. At night, ground scouts used PVS-5s, PVS-2s and the TOW thermal sights, which were invaluable in providing early warning of approaching personnel, vehicles, and animals during assembly area and checkpoint operations at night. The number of night vision goggles was extremely limited, with one PVS-5 per vehicle and a PVS-2 per M60 machine gun. The number of night vision devices is limited and should be increased to a device for each scout. Additionally, each vehicle needs a thermal sight capability for night operations.

Scout platoons were mounted during the majority of operations. Dismounted patrolling was done by engineers,

light infantry, and other personnel from the base camp. Scouts used dismounted movement during some area reconnaissance operations in areas not readily accessible to HMMWVs, but only for very short periods, in small groups, and within supporting distance of scout vehicles. Scouts did not routinely conduct surveillance missions, so, dismounted observation posts were not used.

Convoy security was normally a platoon mission that rotated among platoons. Usually, there was only one such mission a day. The convoys were military supply runs only (no humanitarian assistance convoys were escorted). Being based at two different locations exacerbated fuel resupply.

Scout platoons were not employed in ambushes or night observation posts. Road checkpoints were employed instead. Leaders decided the location of a checkpoint after an initial daylight reconnaissance, then the platoon executing the checkpoint would move in after dark. Each checkpoint consisted of four vehicles, two HMMWVs parked on the road and two more set up off the road in a position to provide immediate support or to intercept vehicles that did not halt. TOW thermals provided early warning when vehicles approached. The checkpoint was set up in one location and was maintained all night.

Movement always occurred in groups of at least two vehicles. When a troop encountered a village, the troop would cover the area outside the village and send two vehicles in. The intent was to determine the population of the village, locate the village elder, and ascertain the identity of the clan occupying the village. Inhabitants were questioned regarding bandit activity, clan rivalries, and what type of assistance was needed. Another objective was to spend some time in the village and try to build good will.

In Our Next Issue...

Cavalry troopers of the 3-17, tasked with protecting humanitarian relief operations in Somalia and keeping the peace, conduct extensive checkpoint operations along rural roads.

The mix of weapons (.50 cal, M60, MK19, TOW) available within the scout platoon proved flexible and successful. However, a lesson was driven home — scout platoons require four-man scout crews because the three-man crew does not allow a two-man scout team to dismount while the vehicle is still crewed with gunner and driver. Platoons routinely found themselves in a situation where more dismounts were required than were available.

Conclusions

The 3-17 Cavalry's experience in Operation RESTORE HOPE provides a good understanding of the divisional light cavalry's strengths and weaknesses. Clearly, light cavalry has utility for operations in peacekeeping operations and other types of conflicts. The squadron's training in preparation for war was also excellent preparation for the operations performed in Operation RESTORE HOPE. The preparation for austere conditions and training in the requisite combat skills allowed the soldiers of 3-17 Cavalry to acquit themselves in an outstanding manner during the operation.

But Somalia indicates, as does previous peacetime experience, that divisional light cavalry squadrons need to be more robust and self-sustaining. The addition of a third air troop and second ground troop, organic fire support, and additional logistics support (especially class III) assets would provide the light division commander additional capability and flexibility. (The addition of a third air troop and a second ground troop were presented to the Chief of Staff of the Army in December 1993, during a Force Design Update. The CSA deferred action to the Force XXI design at that time.) For operations in Somalia, the ground cavalry troop had an adequate mix of weapons, but could have used additional GPS devices, night vision equipment, and long-range communications equipment. These fixes, among others, would optimize the light cavalry's potential and flexibility.

Light cavalry is deployable, responsive, and flexible. Its ability to cover large areas with minimal personnel, and its relatively high level of tactical mobility and firepower,- allowed the 10th Mountain Division to concentrate its light infantry battalions in other essential areas. The squadron also performed invaluable service as a division quick reaction force. The task organization of TF 3-17 Cavalry was in constant fluctuation with each new mission assigned after deployment. The squadron's inherent flexibility enabled it to employ organic and attached assets to accomplish each mission. The light cavalry squadron, with its combination of ground and air troops, has proven to be a very versatile organization.

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The Scout Vehicle

by Lieutenant Colonel John C. Woznick

The M1109 HMMWV, with the Scout Platoon Modification Kit, was displayed recently at Fort Knox. It includes better protection for the crew from mines, bullets, and shell fragments, improved observation and navigation equipment, and greater carrying capacity for scout stowage.

Background: The scout plays an essential role in mounted warfare. He provides the commander with his most critical information: combat intelligence. To accomplish this mission, the scout has special requirements for mobility, stealth, lethality, survivability, and communications. The scout's most essential equipment requirement is the correct scout vehicle.

This article will examine where the scout vehicle is headed: focusing on the battalion scout platoon. It will lay out what is being done to improve current scout vehicle capabilities and what remains to be done. It will examine vehicle alternatives for the battalion scout platoons and lay out our options for how to get to the correct scout vehicle.

Our division and regimental cavalry units will continue to use the M3 Cavalry Fighting Vehicle (CFV) for the foreseeable future. We are making required improvements to the CFV through the Bradley Modernization Program. Near-term improvements are tied to Operation DESERT STORM (ODS) lessons learned — the M2/M3A2 ODS. Long-term improvements will link the Bradley digitally to the force and provide "Abrams-like" integrated fire control — the M2/M3A3. These improvements will provide a significant increase in lethality, mobility, reliability, survivability, and agility. The Bradley Modernization Program is currently funded for both improvements.

M2/M3A2 (ODS) improvements:

- Laser Rangefinder (LRF).
- Global Positioning System (GPS) with integrated compass.
- Driver's Thermal Viewer.
- Battlefield Combat Identification System (BCIS).
- Revised Vehicle Stowage.
- Missile Countermeasure Device (MCD).
- M2/M3A2 (ODS) First Unit Equipped (FUE) projected for FY96.

M3A3 improvements:

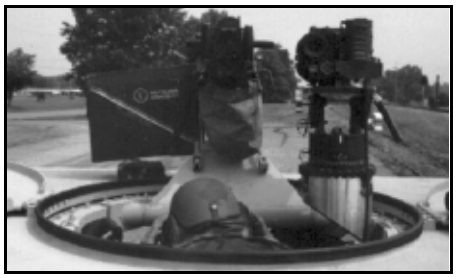
- Core Electronics Architecture (1553 Data Bus).
- Command and Control Hardware and Software compatible with the M1A2's Intra Vehicular Information System (IVIS).
- Improved Target Acquisition (Second Generation Forward Looking Infrared).
- Commander's Independent FLIR.
- Improved Fire Control (Ballistic Fire Control Solution/Dual Auto Tracking).
- M2/M3A3 First Unit Equipped projected for FY00.

The battalion scout platoon equipped with the High Mobility Multipurpose Wheeled Vehicle (HMMWV) is another matter and requires some discussion. Since 1941, the armor battalion scout platoon made three principal transitions: from a mixture of wheels and tracks (1941-1957), to wheeled vehicles (1957-1964), and then to tracked vehicles (1964-1986). The last tracked platoon design was the six-M3 Bradley CFV platoon. And, for reasons that will be discussed, we recently switched back to a wheeled 10-HMMWV platoon. There are considerable philosophical, analytical, and emotional issues in selecting the correct vehicle for the battalion scout platoon. These issues go to the very heart of how scouts perform their mission. What do we expect of the scout vehicle?

Scout Vehicle Requirements: The ability to detect and identify the enemy is the heart of the scout's mission. In the post-cold war world it is most likely that our forces will be on the offensive, moving to the enemy rather than waiting for him to attack. Therefore, scout sensor systems should be able to acquire a prepared, (hull down), stationary enemy while the scout vehicle is moving (or stationary). The sensor system must be capable of doing this at ranges that exceed the threat's lethal reach. And the scout's sensor must do it in adverse weather. The scout would prefer to use totally passive sensors, but may, in some roles, use active means that have a Low Probability of Intercept (LPI) to meet these requirements.

Scout survivability requirements are multifaceted. The scout survives first through stealth, by avoiding detection. If detected, the scout uses terrain, technique, and speed to avoid engagement. The scout vehicle design for survivability should reinforce these means. The scout vehicle should not be designed to survive direct fire engagements, it should avoid them. But the scout vehicle does require protection against unavoidable threats: small arms, unexploded ordnance, mines, and chance artillery.

The scout vehicle must be as least as mobile as the force that it protects. It should, in fact, have a mobility advantage that will allow it to range ahead or alongside the force it supports. Sustained cross-country movement comparable to the armor or mechanized battalion is an absolute requirement. This capability is essential to mobile reconnaissance and security missions. In ad-



The XM1109, an enhanced armor HMMWV, will protect the crew against shell fragments and 7.62mm armor-piercing rounds fired at at 100 meters or more. Windshields and side windows are armored. Shown here with the Scout Platoon Modification Kit, this vehicle is armed with the Mk 19 grenade launcher and fitted with a TOW sight (AN/UAS-11 or AN/UAS 12), GPS, and 2-radio SINCGARS capability, along with a 100-amp alternator.

dition, the scout vehicle should be able to cross difficult terrain and obstacles, and should be able to swim.

The scout mission presents unique lethality requirements. Scouts should avoid direct fire engagements since their primary mission is to report. However, weapons systems can develop the situation, provide security, and assist in disengagement. Battalion scouts require lethality that will allow the selective engagement of enemy reconnaissance and security forces, which may include light armored vehicles. It does not include direct fire engagements with combat systems (tanks and armored fighting vehicles).

The scout vehicle has to haul the considerable equipment necessary for the scout to perform his mission. This equipment includes: sensors/sights, weapons, ammunition, radios, personal equipment, and rations. Because the scout operates semi-independently, payload is a critical requirement. Through some experimentation and analysis, we've established that 2,300 pounds is the minimum essential requirement for a HMMWV scout.

Given the scout's unique mission requirements, it's clear that some conflict. Optimizing payload by increasing internal volume directly conflicts with other requirements like stealth, where a smaller vehicle is better. Mobility and stealth may limit armor protection (survivability). Obviously, there are critical trade-offs that will focus the design issues for the scout vehicle.

What Is Being Done: In 1990, the Army again adopted the wheeled vehicle solution of 10 HMMWVs as the best organization for the battalion scout platoon. The Army made this decision based upon analysis and operational testing. The results indicated that:

- The 10 HMMWV platoon provided greater coverage.
- The HMMWV's stealth allowed it to live longer.
- The CFV's better lethality did not add significantly to its effectiveness.
- The HMMWV had an advantage in supportability.

Yet, since its adoption, the HMMWV has had mixed reviews from scouts and commanders. In the Gulf War, concern over the HMMWV's survivability and its lack of night vision equipment caused some commanders to use Bradleys in lieu of the HMMWVs. Recently, the vulnerability of the HMMWV also led to the rapid procurement of an up-armored configuration of the HMMWV for Somalia. Given these concerns, several initiatives were taken to improve the HMMWV to meet the needs of the scouts.

Survivability is the HMMWV's chief limitation as a scout vehicle. Recognition of this led to the development of requirements for an up-armored variant, the M1109. Development of the up-armored variant was accelerated to deliver a survivable vehicle to the Military Police in Somalia. However, the requirements were originally developed for the battalion HMMWV scout vehicle. The requirements for the M1109 include:

- Underbody protection for the crew compartment against mines and unexploded ordnance of 1 pound explosive weight (up to 12 pounds is desirable and appears possible).
- Three hundred sixty degree ballistic protection **for the crew** from small arms up to 7.62-mm NATO Armor Piercing (AP) ammunition.
- Overhead protection from artillery fragmentation exploding from 20m to 100m from the HMMWV.
- A 2,300 pound payload.

Another initiative to improve the HMMWVs is the Scout Platoon Modification Kit (SPMK). The SPMK requirements were developed to accommodate necessary and upcoming improvements to HMMWV capabilities and include:

- Mounting and power for the AN/UAS-11 or AN/UAS-12 Tube Launched Optically Tracked Wire Guided Missiles (TOW) sights (or later scout sights/sensor systems).
- Provision for two Single Channel Ground and Airborne - VHF (SINCGARS) radios and mounts.
- Global Positioning System and mounting provisions.
- Vehicular intercom.
- A 100-ampere (AMP) alternator to power the new systems.
- Cargo and equipment stowage systems.

Both the up-armored HMMWV and SPMK are funded for limited production. The exact distribution of the up-armored HMMWV is dependent on funding. It is obviously critical that all HMMWV scouts have this capability.

Historically, the last thing we gave the scouts to perform their enemy acquisition mission was binoculars. The Army took several initiatives to correct this situation. The Army made the decision to redistribute AN/UAS-11A (Night Observation Device Long Range - NODLR) or AN/UAS-12A TOW sights (being displaced by the fielding of more capable sights) to the scouts. This gives the scout a first generation FLIR that begins to address the adverse weather acquisition requirements. The Army is also attempting to acquire stabilized binoculars. These will provide high magnification direct-view optics stable enough to provide a high quality image while on the move, something lost in the transition from the CFV to the HMMWV.

However, these sights do not meet scout requirements to acquire the enemy before reaching his direct fire engagement range. To do this, the Army initiated a requirement for the Long Range Advanced Scout Surveillance System (LRAS^3) for scouts. The basis of this system is a second-generation FLIR that is coupled with day television, an integrated LRF, and a digital linkage for GPS that will allow far-target location. The LRAS^3 puts the scout outside the threat engagement range.

Proposed product improvements to the LRAS^3 could meet all scout target acquisition requirements. Significantly, the digital link allows the scout to send digitized target information to other task force elements. This capability would give scouts the ability to pass timely calls for fire to artillery and systems such as the Non-Line of Sight (NLOS) missile. The LRAS^3 requirement is now competing for funding. If procured, it will finally allow the scout to provide critical enemy combat intelligence without sacrificing himself to get it.

The up-armored HMMWV with the SPMK will solve the most glaring vehicle deficiencies. However, the fact remains that the HMMWV was not designed as a scout vehicle. It is not optimized for the role and represents only the minimally acceptable scout vehicle. Shortfalls still exist.

First, unless and until LRAS^3 is fielded, the sights/sensors will be inadequate to the scout's requirements. This makes the availability of the LRAS^3 capability an essential milestone in providing the correct scout vehicle. With it, the scout outranges the threat; without it, he operates within the threat's lethal reach.

Second, the current weapon systems don't meet the unique requirements for scout lethality. With LRAS^3 and a digital communications capability, the HMMWV scout could bring to bear timely and accurate indirect fire from artillery or NLOS missiles by performing far target location and digital target handoff. However, the scout HMMWV primary weapon systems lack the capability to bring precise, direct fires to bear.

Finally, the HMMWV has excellent mobility on roads and most terrain. However, the HMMWV cannot cross trenches, break through obstacles, or swim. And although the up-armored HMMWV will provide enhanced protection to the crew, it is still vulnerable to mobility kills because the suspension and engine are unprotected. The up-armored HMMWV still is not the proper scout vehicle, but a system designed to correct the most grievous scout HMMWV faults.

Future Scout Vehicle (FSV): In the long term, both cavalry and scout modernization needs will be met through the FSV. The FSV will be a vehicle specifically designed for combat reconnaissance. The Armor Center has defined its requirements in a Mission Needs Statement (MNS). The FSV will be a highly mobile platform incorporating reduced signature/ stealth technology, advanced vetronics and communications, and integrated defensive measures for high survivability. The FSV design will provide a basic vehicle that can be configured to meet the full spectrum of scout mission requirements, from battalion scout through armored cavalry regiment with a dedicated scout design.

FSV design characteristics include:

- Reduced signature.
- Advanced sensors to meet full scout target acquisition requirements.
- Advanced communications.
- Mobility differential (sustained cross-country movement, swim without preparation).
- Tailored weapon systems (selected for each vehicle's mission role).
- Roll-on/roll-off C-130 aircraft/CH-47D helicopter transportable.

The mission needs statement for the FSV has been validated by DA, but the system has not been allowed to compete for funding. DoD is currently considering the FSV for approval as a joint program. The FSV requirement remains the objective solution to scout and cavalry requirements; however, it will be years before the system is fielded.

The up-armored HMMWV and LRAS^3 continue to compete for limited resources. Although we remain hopeful, we have to ensure the scout vehicles that we have will perform until the fielding of the FSV.

Therefore, several alternative strategies suggest themselves.

The first possible strategy is to keep the scout HMMWV as is and begin a crash effort to field the FSV. This possibility is undesirable because of the HMMWV limitations we've defined. A quick decision for a FSV new start is also unlikely.

The second strategy is to field the up-armored HMMWV with SPMK to all scouts and continue to press for the FSV. This would correct the worst of the HMMWV deficiencies and provide the scouts an enhanced capability. It would not meet all scout requirements. It would provide a minimally acceptable scout vehicle until fielding of the FSV. The LRAS^3 would provide the next essential improvement. The LRAS^3 will allow the scout to perform his mission and survive. This is the current strategy.

The third strategy would be to reconsider the HMMWV scout platoon and field a pre-existing tracked vehicle option that might meet more of the scout vehicle requirements as an interim solution for the FSV. Two home-grown possibilities exist: the M3 CFV, and the M113A3. This option requires an evaluation of these vehicles against the scout vehicle requirements.

In target acquisition (the most essential scout capability), the Bradley M3 with its stabilized, high quality FLIR sights is a clear leader. This is especially true as the M3A3 is fielded with a second-generation FLIR. If the LRAS^3 is fielded, the up-armored HMMWV (or M113A3) will close the gap and come much closer to the Bradley M3 acquisition capability. Both the Bradley M3A3 and LRAS^3 would allow far-target designation and handoff.

The HMMWV option provides the best stealth (the scout's top survivability feature). The M113A3 is stealthier than the Bradley, but from an acoustic, visual, and infrared standpoint, both tracks have much more prominent signatures than the HMMWV.

The tracks, however, provide the best protection. The M3A2 is considerably better than the M113A3 (with applique the M3A2 has protection against handheld High Explosive Antitank (HEAT) and some Antitank Guided Missiles). The up-armored HMMWV provides crew protection against small arms and fragmentation, but is still vulnerable to mobility kills. **No** vehicle is immune to the mine threat, although both tracks have a structural advantage and some built-in, or add-on, protection. The up-armored HMMWV provides only crew protection against mines.

All options have good mobility, but tracks provide an advantage in some soils and terrains, and in crossing obstacles, and both tracks can swim. All candidates are capable of keeping up with the force in terms of speed.

The M3 is undoubtedly the most lethal system. Its fire control, the automatic cannon, and its TOW missiles make the M3 fully capable of defeating threat reconnaissance and security threats as well as most combat vehicles. The issue may be that the M3 is too lethal a system and tempts the scout to engage instead of reporting his primary mission. This is an old argument. All the other candidates rely on limited area fire weapons.

The HMMWV payload is adequate. The up-armored HMMWV is being designed to maintain the scout's minimum requirements. The Bradley and M113A3 both have significantly greater payloads (the M113A3 is a big armored cargo box). Payload also has a positive impact on the number of crewmembers the vehicle can carry and dismount.

Finally, the costs of maintaining and supporting the HMMWV option is clearly less than the tracked options. The tracks require more Class IX, fuel, and maintenance support; the HMMWVs have greater mean times between failures. In times of decreasing budgets, this may have a great impact.

These comparisons are based on a simple set of rankings without weights and are not meant to represent a definitive analysis. They do take into account analytical work and data gathered in the past, as well as the requirements definition process underway at the Armor Center.

All things being equal, there is an advantage to the tracks (especially the M3) as the best scout vehicle. Of course, all things are not equal. Enemy acquisition is clearly the heart of the scout's mission, so the advantage for the M3 is even more pronounced. This is the argument for an advanced scout sensor.

The HMMWV platoon has four more vehicles than the M3 platoon. The advantage in flexibility and coverage that a 10-vehicle design offers was an essential element in the Army's choice of the original HMMWV platoon design. The advantage gained, for the same number of soldiers in the platoon, weighs on the side of the HMMWV solution.

Ultimately, the comparison highlights the trade-offs necessary to optimize scout vehicle design and shows that no option integrates the requirements in an optimum way. The FSV is the long-term answer to developing a truly integrated design.

Conclusions: The optimum scout vehicle has not yet been designed. The requirements are well known, but current vehicles are partial solutions derived from other uses. None entirely meet the requirements for the scout vehicle we need.

The M3 is, and with its improvements remains, an effective scout vehicle. Its target acquisition capability makes it a more effective vehicle on a one-for-one basis. It does not have the stealth to operate optimally in all scout roles.

The up-armored HMMWV with the SPMK is a near-term solution. It meets the scout's minimum requirements. LRAS^3 is the essential improvement that will make the scout up-armored HMMWV an effective interim vehicle. The LRAS^3 will provide the scout with the target acquisition capability he needs to perform his mission and survive. Without these improvements, our current scout vehicle is inadequate and will remain so until the FSV is fielded.

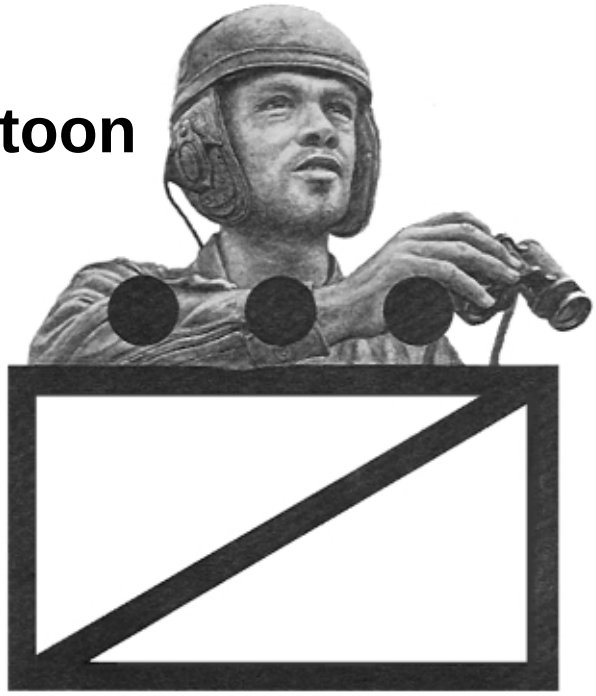
If these improvements are not forthcoming, we should consider the more survivable, mobile, and capable tracked vehicles as interim scout vehicles until the FSV is fielded. There are not enough Bradleys for all claimants currently; we would have to make scout requirements a priority. M113A3s, with thermal sights, could also be an effective interim vehicle until the Army fields the FSV. Testing of these alternatives could begin now.

The ultimate solution to scout vehicle requirements is the FSV, a vehicle designed specifically for the scout mission. With advanced sensors and communications, and designed to minimize its signature, the FSV will provide the scout an optimum platform to perform his indispensable mission.

Lieutenant Colonel John C. Woznick is a 1976 graduate of the State University of New York at Geneseo, was commissioned through OCS in 1977 and attended the Armor Officer Basic Course. He served as a cavalry platoon leader and tank commander executive officer in the 2d ACR; and following AOAC was S2/3, BMO, and tank company commander in the 194th Armored Brigade. After serving as a Research and Development Coordinator at Benet Labs, he accessed into the Acquisition Corps. He attended CGSC and then earned his masters degree in Materiel Acquisition Management at Florida Tech. He recently served as Cavalry Branch Chief, Maneuver Division, Directorate of Combat Developments at the Armor Center. He is currently attending the Defense Systems Management College prior to a posting as Armor Technology Manager at the Army Research Laboratory at Aberdeen Proving Grounds, Md.

Full Circle: The Armored Cavalry Platoon

Brigadier General Philip L. Bolté, U.S. Army, Retired



The pages of *ARMOR* have often included articles by cavalrymen complaining about the cavalry organization. In one recent issue, it was a cry for mortars in the platoon. Before the latest organizational change, they called for tanks in the divisional cavalry squadron. More "dismounts" has been suggested. These articles may have reflected the Army's own periodic dissatisfaction and frustration as it strived to get it right. Perhaps it is time to look back and see if just maybe it was done right once before.

During World War II, U.S. Army armored cavalry elements were generally equipped to provide reconnaissance to their parent units. The basic vehicles used were the ¼-ton "jeep" and the M-8 armored car. The jeep had no armor protection and was limited in weapons-carrying capacity to a machine gun, either .30 or .50 caliber. The M-8 armored car was a lightly armored vehicle based on a 2½-ton truck chassis and armed with a 37-mm cannon. Units so equipped often found themselves up against far heavier enemy elements in their search for information, so at times, cavalry units were augmented with tank or tank destroyer units to allow them to accomplish reconnaissance and other combat missions.

At the end of the war, a group of combat veterans familiar with armored cavalry operations met under the auspices of the Continental Army Command (CONARC) to establish the proper organization and materiel requirements for armored cavalry in the post-war U.S. Army. CONARC, headquartered at Fort Monroe, incorporated many of the functions of the current TRADOC.

The veterans studying the requirements for armored cavalry had served

Cavalry Steeds, Circa WWII

At left, the unarmored jeep was the cavalry's indispensable mount in WWII. This one, advancing near Worms, Germany in 1945, carried a pintle-mounted .30 caliber Browning machine gun. The M8 armored car, above, was lightly armored and armed with a 37-mm cannon. The vehicle was developed on the 2½-ton truck chassis.

Postwar Cavalry — A Combined Arms Force

M24 light tank sections beefed up the organization of postwar cavalry units. These M24s are seen moving down a forest road in Germany late in WWII.

Halftracks soldiered on after the war and saw action in Korea. Some were employed as troop carriers; others carried mortars or antiaircraft guns. This one mounts a 40-mm AA gun.

in units that had taken on the whole array of cavalry missions: reconnaissance, security, economy of force, and, at times, attack and defense. The basic armored cavalry structure that emerged was a platoon that was itself a microcosm of a mechanized combined arms force. Led by a lieutenant in a jeep, the platoon included a scout section of two scout squads in two jeeps each, a tank section in two light tanks, a rifle squad in an armored personnel carrier, and a mortar squad with an 81-mm mortar mounted in an armored vehicle. In the late 1940s, the jeep used was the original World War II model, the light tanks were late-World War II M24s, and the rifle and mortar squad carriers were World War II half-tracks.

Delaying for the moment discussion of the platoon equipment, it is worthwhile to examine the organization. The platoon, particularly as a component of a three-platoon company, was capable and flexible.

Organization

The platoon leader, mounted in the same vehicle as his scouts, could easily exercise control over his scout section when on reconnaissance or security missions. The scout section itself, with two scout squads, could move or observe on one or two routes, or even four when not too widely separated.

The tank section of two tanks could protect the scouts with significant direct protective firepower, particularly in an overwatching role. Enemy security forces could be quickly overcome with immediate application of armor offensive action. The rifle squad provided the platoon with a more significant dismounted fighting capability than could the scouts. Against roadblocks, enemy security forces, or in built-up areas, the rifle squad was immediately available to the platoon leader for dismounted action. In addition, the squad could supplement the scouts in security missions over extended frontages requiring a number of observation posts beyond the capability of the scouts alone.

The mortar squad provided the platoon leader with immediate and responsive indirect fire. Communication with the squad was easy and there was no question of priority of fires.

In short, the cavalry platoon leader had on hand a small combined arms team. The organization was particularly suitable for far-ranging missions. What the platoon lacked, of course, was very much of anything. This situation could be overcome partially at the company level. Not only could a company commander maneuver his platoons to be mutually supporting, but he had the ability to realign the platoons. In this "scrambling," the scouts of all three platoons could be grouped together under one platoon leader, the tanks under another, and the rifle squads under the third. The mortars could be grouped together, as well, generally under the senior mortar squad leader. Thus, the company commander had a six-tank platoon (seven if he added his company headquarters tank), a three-squad rifle platoon, a three-tube mortar battery, and a mounted or dismounted scout platoon that could be used in a variety of ways. Units practiced this "scrambling" so that they could easily transition to it.

Equipment

The biggest weakness of the cavalry platoon of the 1950s was its outdated equipment, which the Army set about to correct.

The jeep was eventually replaced with the M114, a fully, but lightly, armored vehicle mounting a 20-mm automatic cannon. While perhaps sound conceptually, neither the vehicle nor the weapon were satisfactory. The reputation of the M114 was not enhanced by the fact that cavalry scouts in Europe for years logged thousands of miles patrolling the roads along the East-West German border, an activity more suited to jeeps than tracked vehicles.

The M24 tank was replaced in the 1950s with the M41, an excellent light tank with a high-performance gun. Nevertheless, the 76-mm gun and light armor of the M41 were no real match for modern main battle tanks. The M41 gave way to the Sheridan and the main

Upgrading Equipment in the ’50s

The M41 light tank, upper right, replaced the M24, providing increased firepower with a high velocity 76-mm gun. But the M41s light armor, and the prospect of its use against heavier Soviet Bloc tanks, shortened its Army career. (During the Vietnam War, South Vietnamese M41s had little problem dealing with Chinese T-59s —T-54 copies — and PT-76s in Operation LAM SON 719, destroying 22 enemy tanks with no losses).
Above, the M39 carrier, a variant built on the M24 tank chassis, was used to carry troops and, in this case, an 81-mm mortar team.
The 20-mm autocannon on the M114, at right, was an improvement on the jeep’s firepower, but reliability problems, poor mobility in Vietnamese terrain, and the vulnerability of its gasoline fuel system retired it early.

battle tank. Here again, the role of cavalry in Europe played a part: the cavalry regiments could well have been called “antitank regiments,” with the initial combat mission of killing as many Warsaw Pact tanks as possible as they withdrew.

The rifle squad went through a series of vehicles, including the M39, a derivative of the M24 chassis with no top armor; and the M75 and M59, both fully armored. They were finally mounted in the fully armored M113.

The mortar squad half-track gave way to two jeeps and trailers as half-tracks were phased out of the Army. Finally, armored mortarmen got their own M113-based vehicle, the M106 for a larger 4.2" mortar and the M125 for the 81-mm mortar.

As a sidelight, it is interesting to note, in this time of concern for air deployment, that each of the Army’s two airborne divisions had an airborne reconnaissance company organized similarly, but with different equipment. Each platoon had a section of two jeep-mounted 75-mm recoilless rifle squads instead of light tanks and the rifle and mortar squads were mounted in jeeps.

A New Look

But despite these equipment changes, the cavalry platoon organization of the 1950s and 60s remained essentially the same. There were, in fact, few complaints from the field concerning the structure of the platoon.

Nevertheless, flexing the muscle of its increasing analytical capabilities, the Armor Center set about — starting in the 1970s, and perhaps even earlier — to fix what may not have really been broken in the first place. A number of studies have been conducted at Fort Knox aimed at optimizing cavalry organization.

Perhaps the lessons of World War II were forgotten as the veterans of that war retired. Perhaps it was that the influence of the Korean War and then Vietnam on those conducting the studies. Certainly, one factor was the necessity to generate personnel spaces for growing aviation assets related to cavalry. Through these decades, as well, we felt the influence of the antitank role for much of the cavalry in Europe. Finally, there is always the fact that it is difficult for a study task force to conclude that everything is just fine the way it is.

At any rate, the “combined arms” platoon was gradually eliminated and cavalry platoons became an organization of scouts and tanks, or scouts alone, depending on their parent unit. And now the cries are heard: “need more dismounts,” “need more tanks,” and “need a mortar.”

Perhaps it is time to take a new look at the organization fashioned by those who spent 1944 and 1945 fighting a well-trained and motivated enemy peer. New equipment available today would surely result in some modification, but the flexibility and responsiveness of the “mini-combined arms team” of the 1950s and 60s cavalry platoon had much to offer — and still might.

Brigadier General Philip L. Bolté was commissioned in Cavalry from USMA in 1950. He served in a number of cavalry units, including the 3d and 14th Armored Cavalry Regiments and the 11th Airborne Reconnaissance Company, and commanded the 1st Squadron, 1st Cavalry in Vietnam. He is a graduate of the Armor School, the Canadian Army Staff College, and the Army War College. He retired in 1980 from his final assignment as Program Manager, Fighting Vehicle Systems.

Assault Gun Battalion 96

by Major Martin N. Stanton

With any new system comes the requirement for a new doctrine of employment. The Close Combat Vehicle Light (CCVL) is a new type of combat vehicle for the U.S. Army, a lightly armored vehicle with the punch of an MBT. Its employment must be carefully considered.

I would recommend that most of the CCVLs should be organized into assault gun (AG) battalions, with one battalion assigned to each light division and airborne division. (The air assault division would not be allotted an AG battalion because of its specialized airmobile nature.) Each of these battalions would be organized into three line companies of 14 CCVLs each, with two CCVLs in the battalion headquarters section. The major difference in organization between a normal tank battalion and an AG battalion is the number of line companies (3 instead of 4) and the lack of a heavy mortar platoon (Figure 1).

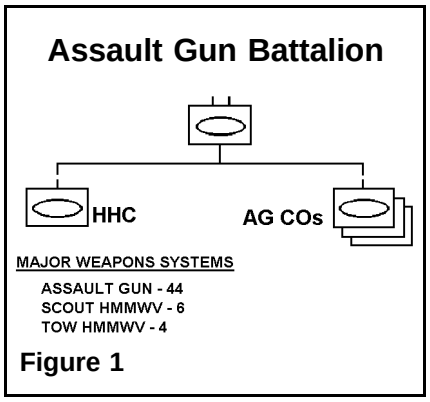


Figure 1

The reason for this different organization is the fundamentally supporting role that the AG battalion would play. Although there are instances in which the AG battalion would fight as a unified command, the battalion would normally cross-attach its companies to support light infantry units, one company per infantry brigade. The AG battalion does not need the heavy mortar platoon because, on most occasions, its subunits would be operating within infantry mortar fans. The capabilities statement for the AG battalion should read something like this:


One of six preproduction versions of the XM-8 Armored Gun System now going through extensive testing. A final decision will be made on full-scale production after March, 1997.

- Conducts operations requiring a high degree of firepower and mobility, along with moderate armor protection.
- Attacks by fire or defends under hostile fire and during limited visibility conditions.
- Destroys enemy mounted and dismounted forces by fire.
- Commands, controls and maneuvers groups of assault gun, infantry, TOW, attached/OPCON heavy forces (armor or mech), and attached/OPCON USMC or allied nation elements to engage the enemy in mobile warfare.
- Provides separate AG company/platoon force packages, with sustainment and maintenance capability, to airborne/light division brigades or battalions for contingency operations.
- Supports the maneuver of infantry battalions by providing overwatch and direct fires.
- Provides combat service support to the headquarters and line companies to include supply, maintenance, medical, mess, and unit-level administration.

To operate as a fully functioning independent tactical element, the assault gun battalion requires the following attachments:

- A battalion fire support section with a BN FSE and company-level FIST teams.
- A USAF TACP for directing tactical air support.

The organic maneuver elements of the AG battalion are formed into three AG companies and a scout platoon configured as follows:

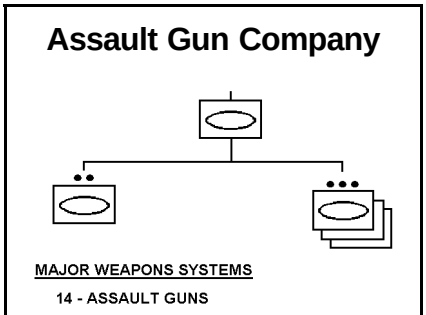
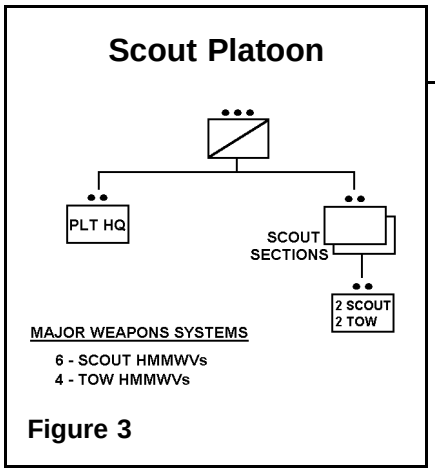


Figure 2

The Assault Gun Companies — The AG companies will be organized similar to tank companies, with four CCVLs in each platoon and two in the headquarters section, which will also have two HMMWVs. The AG companies will train for operations both as part of the AG battalion and as separate companies attached to infantry brigades or battalions. The primary capabilities of the AG company are as follows: (Figure 2)

- Suppress and kill heavy and light armored vehicles with the 105-mm gun.
- Suppress and kill enemy bunkers, field fortifications, or positions in a built-up environment (MOUT) with the 105-mm gun.



- Suppress and kill soft targets with the 105-mm gun and machine guns.
- Provide limited air defense with organic mounted machine guns.
- Engage and suppress or kill enemy systems or positions at night or in limited visibility.

The Battalion Recon Platoon — The scout platoon organization is exactly the same as that of a J-Series light cavalry platoon. The platoon will be authorized four additional .50-caliber machine guns for employment on the TOW HMMWVs when there is no armor threat for the TOW systems to engage. The platoon would have the same missions as a tank battalion scout platoon when the AG battalion is operating as a battalion-level formation. The platoon can also be cross-attached to the infantry brigades in the same manner as an AG company should there be a requirement for a mounted reconnaissance element. In this case, the platoon will draw all support and classes of supply from the unit of attachment. (Figure 3)

The CSS and C² structure would be similar in function to the normal J-Series TO&E tank battalion, but because of aircraft restrictions and the desire to economize on space and weight, certain vehicle types are going to have to be substituted for their tank battalion counterparts. For example, the M577s of the battalion headquarters will have to be replaced with HMMWVs configured for TOC operations. Likewise, the battalion's ambulances and maintenance contact team vehicles will also have to be HMMWVs, as opposed to M113s. The battalion support platoon will operate out of 5-ton trucks because of size and weight restrictions. The idea is to keep vehicle types to a minimum for both weight and PLL considerations. Ideally, we should have just four, CCVLs, M578 recovery vehicles, 5-ton truck variants (fuel tanker, wrecker, cargo, PLL) and HMMWV variants (scout, C², TOC, cargo). We will address each C² and CSS organization in more detail.

Command and Control

Battalion Command Group — The battalion command group would consist of three HMMWVs for the battalion commander, XO, and S3. Each would have dual FM RTs and one auxiliary receiver, all secure capable. In addition, the battalion commander and XO HMMWVs would have MSE systems installed.

During operations when the battalion commander was forward in his AG, the battalion CSM would use the commander's vehicle to assist the XO and HHC commander in ensuring the smooth flow of support to the companies. The CSM's HMMWV would also act as a relay if communications ranges became extended too quickly for the communications platoon to establish a relay or RETRANS. The command-configured HMMWVs would also be useful in liaison roles, providing an LNO with a robust communications setup from which he could more effectively coordinate with the AG battalion.

Battalion Communications Platoon — The battalion communications platoon would be similar in design and function to that of a J-Series tank battalion, with the exception of the M577/M113, which would be replaced by a C²-configured HMMWV.

The Battalion TOC — The battalion TOC would be configured much like a light infantry battalion TOC. Its equipment would consist of HMMWVs with ¾-ton trailers. Unlike the light infantry TO&E, however, I recommend that the S2 and S3 sections each get their own separate HMMWV, as opposed to sharing one as they do in the J-Series Light Infantry TO&E (which is one of the dumber things the U.S. Army has done in this century). These HMMWVs could either be cargo HMMWVs customized for C² or ambulance HMMWVs (4 stretcher) customized for C². The tent they would use is the same Standard Integrated Command Post System (SICPS) used by the light infantry battalion, a lightweight frame and canvas tent that folds up to a fairly small package and fits nicely in the ¾-ton trailer. A good TOC crew can erect a two-module SICPS in about 10 minutes. If necessary, they could pull up side-by-side (not back-to-back as they're both dragging trailers) and operate for short periods of time. The TOC would have the same communications capabilities as a normal tank battalion TOC to include MSE. The battalion FSO should have a similarly equipped HMMWV for the battalion FSE section that boots into the TOC in the same manner as the other two sections. In addition the battalion FSE would have his own dedicated HMMWV as well as a FIST HMMWV for each company.

The total signature of the TOC would be four HMMWVs with trailers (battalion S3 section, S2 section, FSE, and a communications section HMMWV). The TOC would have no weapons larger than 7.62 machine guns. In LIC operations, where dispersion of C² and CSS assets is not as critical a factor due to a low indirect fire threat, the battalion XO might want to consider combining his combat trains location and TOC location in order to combine firepower and troop strength for security. This technique was used by my battalion successfully on several occasions, including our deployment to Somalia. The downside is, of course, if your security is sloppy or inadequate, you stand to lose C² and CSS in one fell swoop. It's a METT-T consideration.

CSS Structure

Combat Trains — The AG battalion combat trains would be similar in form and function to those of a tank battalion. The main difference would be in the configuration of the ALC, which would consist of two C²-configured HMMWVs similar to those used in the battalion TOC (one each for the S1 and S4 sections) and one SICPS tent. Communications equipment would also mirror the tank battalion TO&E and would include MSE.

Field Trains — The AG battalion field trains would mirror the function of a tank battalion field trains. They would co-locate with either the BSA of the supported infantry brigade or the MSB. If neither of those organizations was within practical distance, the field trains would co-locate with

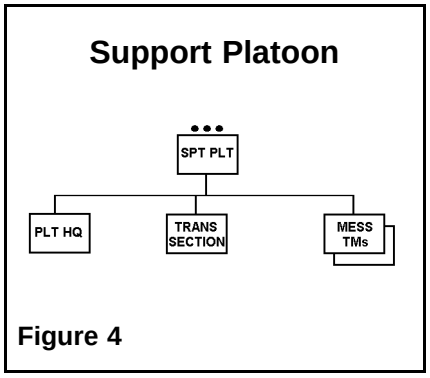


Figure 4

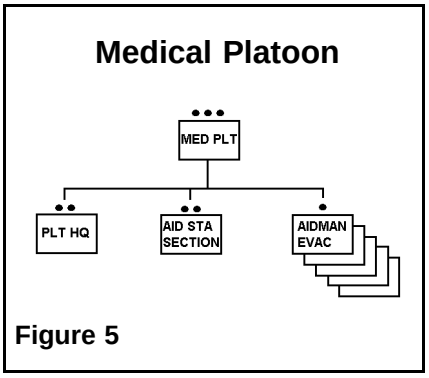


Figure 5

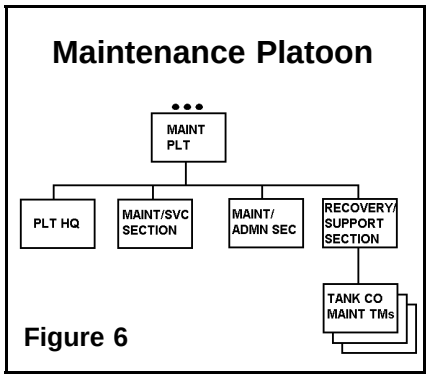


Figure 6

the combat trains or position itself separately. However, due to the small number of personnel in the field trains and its lack of combat power, every attempt should be made to co-locate the AG battalion field trains with other assets.

Support Platoon — The AG battalion support platoon is organized along the lines of a tank battalion support platoon, with the exception of the mess section. It would service only a consolidated battalion mess, both in garrison and in the field. The primary reason for this is air transport considerations. The AG battalion is too small to justify four separate company mess teams with MKTs. When subunits are cross-attached for long-duration missions (i.e. one company of the AG battalion goes on a contingency mission as part of an infantry brigade package while the remainder of the AG battalion stays at home station) then the AG battalion commander can attach one of the mess teams and MKT to the cross-attached company. Normally though, the cross-attached AG company would receive Class 1 — both MREs and hot meals — from the unit of attachment (i.e. the infantry brigade).

The transportation section would have the normal fuel, ammunition, and supply sections that are found in a tank battalion, but instead of HEMTTs the platoon would have 5-ton trucks, thus losing some cargo capacity. The support platoon HQ would have two HMMWVs (PL and PSG) with dual net capability (secure). (Figure 4)

Medical Platoon — The aid station would be organized like a tank battalion aid station, with a HQ section, aid station section, an evac section, and company aid teams. The HQ section consists of one HMMWV with two FM secure radios for the platoon leader. The aid station section would have two HMMWV ambulances with ¾-ton trailers. The aid station itself would consist of SICPS tents booted in to the aid station HMMWVs in a style similar to that of the battalion TOC. The evac section consists of two HMMWV ambulances. Each company aid team would have one HMMWV ambulance. The teams would be dedicated to each line company on a permanent basis. Radio configuration of aid vehicles would be similar to that of a tank battalion. (Figure 5)

Maintenance Platoon — The maintenance platoon would be organized along J-Series tank battalion lines with all maintenance assets consolidated at battalion and cross-attached out. The platoon would have one extra major recovery vehicle, an M578, to compensate for the fact that there are no other armored-type units in the division, and two 5-ton wreckers. The platoon would have the same recovery and maintenance functions as the maintenance platoon of the tank battalion. (Figure 6)

Tactical Employment of the Assault Gun Battalion

The AG battalion represents the most concentrated and mobile firepower available to the light/airborne commander. The CCVLs will be the most potent fighting vehicles in his organization, and the temptation to employ them as light tanks will be a strong one, but it is a temptation that he should resist. The CCVLs have several important limitations.

- The assault gun (CCVL) should not be used for close assault because it is more vulnerable than a tank to shoulder-fired infantry antitank weapons. If close assault tasks are unavoidable, dedicated infantry elements attached to the CCVLs should protect them from this threat. The assault gun is also vulnerable to enemy infantry when employed in restrictive or close terrain. Dedicated infantry security will be necessary there, too.
- The assault gun can't traverse slopes or difficult ground like the M1A1. It cannot swim, and requires bridging or rafts to cross water obstacles of greater depth than its fording capability. The assault gun's fording capability is less than an M1A1.
- The assault gun's smaller 3-man crew will become fatigued more quickly on continuous operations, and there will be fewer people to perform vehicle maintenance and security.
- The 105mm may not be capable of penetrating the frontal armor of modern main battle tanks (Leopard 2, Merkava, M1s, T-80s, etc.).

The CCVL's concept of employment should go back to the divisional tank battalions of the 1940s and '50s; that is to say, the CCVLs will usually be supporting infantry, as opposed to breakthrough, exploitation, and pursuit. In effect, the CCVL unit would function like the German Sturmgeshutz units of WWII. Although the AG battalion will have the capability to operate as a battalion, the LIC/contingency aspect of most deployments from light divisions (i.e. brigade force packages) will drive the cross-attachment of AG companies.

AG Company Missions

As part of an infantry brigade force package, the AG company can remain consolidated to weight the brigade main effort, provide a reserve, or be broken up into platoons for cross attachment to infantry battalions. The decision is METT-T dependent, but a good rule of thumb would be that the assault gun platoons would be more likely to be cross-attached during offensive operations and kept consolidated in the defense. (Figure 7)

Offensive Operations — In the offense, the assault gun company or platoon would be most effective working

Assault Gun Company TM (Attached Slice)

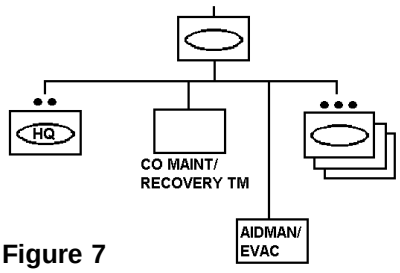


Figure 7

for the infantry battalion(s) they are supporting. This is true especially in a MOUT and/or restricted terrain environment. It would not be uncommon to find the platoon cross-attached down to the infantry company level. The assault guns would operate in a close support role, normally within 2,000 meters of the enemy (possibly as close as 20 meters, depending on visibility and the ability to get a clear shot at the target). The infantry would provide security for the assault guns as well as target designation. In turn, the assault guns would destroy point targets that the infantry designates. This designation might be made by voice (FM), tracer, smoke, or any combination. This employment would very much resemble the classic tank-infantry teams of WWII, Korea, and Vietnam. In spite of the improvements in antitank technology, recent events across the world in places such as Somalia have once again proved the worth of this tried and true formula.

When terrain is more open and it is possible to employ more than one platoon with each company, then the brigade or battalion commander might wish to consider creating a heavy company team by cross-attaching one AG platoon per infantry platoon. This would allow the brigade or battalion commander to have a heavy force of two AG platoons, enough vehicles to permit cross-attached infantry to ride on the vehicles. This force could be displaced quickly from one position to the next to provide massed fires, with the cross-attached infantry providing local security.

Defensive Operations — In the defense, the infantry brigade commander would want to keep his assault guns consolidated to be able to mass their firepower on the main enemy threat. This would probably entail positioning them in depth, rather than forward. All this is METT-T driven, the brigade commander analyzing his avenues of approach and weighting them accordingly. Considering that the AG company is the only rapidly repositionable asset he would own, it is unlikely that a commander would commit it to a specific avenue of approach unless it was the only one. It must also be remembered that the AG company requires infantry security, no matter where it is positioned initially.

LIC Missions — The AG company can perform the same infantry direct fire support missions in LIC as it does in conventional warfare. The AG unit is still basically dependent on the infantry for security and target acquisition, identification, and designation. In addition to acting in their traditional support role, the AG company can perform other important LIC tasks.

Act as a blocking force. When terrain permits (i.e. more open, better visibility), the AG company with attached infantry can act as a blocking force or as part of a cordon. The ability of the AG company to move quickly can allow it to move rapidly into position before the enemy can react. Although ill-suited for actually chasing LIC type enemies, the AG company can be used as an effective "stopper in the bottle."

- **Provide convoy security.** When convoys are operating over short to medium distances (less than 100 km) on a continual basis, the AG company can provide convoy security. A platoon of assault guns and a platoon of light infantry, in addition to the weapons of the transportation personnel, can present a formidable force to any would-be ambusher in an LIC environment. Although convoys of longer duration and range are possible, these operations would entail refueling on the march and the need to attach recovery assets. The requirement for extended range convoy escort should be balanced against the support requirements, the amount of wear on the vehicles, and the threat. If not required for reconnaissance purposes, the scout platoon of the AG battalion, configured with MK 19s and 50-caliber machine guns in a 50/50 mix, would be ideal for this type of mission.

- **Critical site security.** Although armor soldiers cringe at this, critical site security is one of the most useful missions an armored unit can perform in LIC. In Vietnam, on more than one occasion, the presence of just a few tanks made the difference between a firebase or logistics base being overrun or successfully repelling its attackers. In LIC, the tendency will be to consolidate critical assets into large, easily guarded sites due to the lack of significant artillery or air threats. Putting assault guns in fighting positions on the perimeter will add considerable firepower to the defense, and the CCVL's thermal optics will provide significant early warning capability.

AG Battalion Missions

Even though the primary mission of the AG battalion is to support the infantry brigades of light divisions, there will be occasions when the light division commander may wish to use the AG battalion as a separate maneuver element. The missions would reflect the desire to achieve short-term objectives from the massed application of speed and firepower, as opposed to any long-term use of the AG battalion in this manner.

Offensive Missions — Since the AG battalion's companies would normally be attached to infantry brigades, an AG battalion offensive mission would most likely be a special mission that could not be accomplished by the normal infantry brigade task force. This type of mission would most likely involve the ability of the AG battalion to move rapidly and apply firepower. For example, the division could use the AG battalion with attached infantry riding on the vehicles as a "forward detachment" to seize key terrain (i.e. bridges, river crossing sites, defiles, etc.). Obviously this is a high-risk operation, especially from the point of view of the infantry who would be riding on the assault guns or accompanying in trucks.

The AG battalion could also be part of a task force with cross-attached infantry, cavalry (LT), and air defense units (Vulcan) to form a heavy firepower task force that could be used to quickly move from one brigade sector to another to reinforce success or provide additional firepower to the at-

The XM-8 Armored Gun System fires its 105-mm cannon in a California test. The gun is fed by an autoloader, so the crew is reduced to three. A "pepper-pot" muzzle brake helps reduce recoil effects on the 19.5-ton vehicle.

tacking infantry brigades. This TF would normally include two AG companies, an infantry company for security, and other assets if available (i.e., the TOW platoons of the ground cavalry troop and Vulcan platoons, if those are still in the inventory). Because infantry brigades attack at a walking pace, the AG TF would be able to reposition between elements at mechanized speeds and could effectively concentrate combat power at the time and place needed.

The AG battalion TF could also be allocated to the aviation brigade to act as part of the divisional covering force. This would both increase the frontage the light cav squadron could cover and provide it with considerably improved firepower in the event of chance contacts.

Additionally, it is possible that there will be times that the AG battalion and the light cav squadron are the only elements deployed from a light infantry division. For example, although the 10th Mountain Division did not deploy to DESERT SHIELD, its AG battalion, had it existed at the time, might have been cross-attached to XVIIIth Airborne Corps to improve the AT capability of the 82d Airborne. It is not inconceivable that this may happen in the future. The Army's ability to fly AG units on C-17s opens up many new possibilities for cross-attachment. Although by no means a heavy division, the 82d Airborne with three AG battalions (1 assigned, 2 attached from 25th ID and 10th MTN) along with the air transportable 2d ACR (LT) would have presented a much more formidable force than the division projected in Saudi Arabia in Aug-Sept 1990.

Defensive Operations — The AG battalion's defensive role would be limited mainly to being the division commander's counterattack force. Light divisions normally defend in terrain that has limited avenues of approach for armor/mechanized forces. The AG battalion would be employed as a battalion when there was a significant enemy armor/mech threat and when there was more than one avenue of approach into the division sector. Due to their relatively immobile nature in the face of an armored threat, the infantry brigades would be emplaced in depth along the avenues of approach and in and around key terrain features, such as towns with road network intersections, etc. The intent would be for the infantry to take the initial shock of the enemy attack and force the enemy to commit his reserve and define his main attack. At that time, the AG battalion would be released to counterattack by fire. Since light infantry would be defending in terrain that normally has only battalion avenues of approach or smaller, the concentration of the AG battalions weapons would have a good chance of blunting the enemy attack.

CCVLs in the 2d ACR

The 2d ACR's CCVLs should perform the same functions as tanks in a heavy ACR. The 2d ACR Light is obviously less capable of toe-to-toe combat with enemy heavy forces than its heavy counterparts. The ACR will probably not be used for offensive or defensive guard type missions that require decisive engagement and no penetration by enemy forces. However, the CCVLs will allow the ACR to screen more effectively and fight through resistance that would have stopped it in its previous pure HMMWV configuration. Conversely, in defensive screening operations, it will be better able to strip off enemy recon and advanced guard elements before collapsing the screen and conducting a rearward passage through friendly elements.

"Although the present tank gunnery tables give the fledgling AG battalion a basis to start from, I feel that we should add some special infantry support tasks. There should be a vehicle battle run through close terrain with an infantry platoon that designates targets."

Because the basic cavalry missions have not changed, CCVLs should be allocated two platoons per cavalry troop and three per squadron AG company. The only difference in total authorization of vehicles is that I would recommend that the cav troop commanders and the cav squadron commander/S3 work out of hard-top HMMWVs, as opposed to CCVLs, due to the limited space within the CCVL. Therefore the cav troops would have eight CCVLs and the squadron command group would be strictly HMMWVs. The assault gun company would be the standard TO&E of 14.

Working with Infantry

The AG battalion is going to have to resurrect some armor skills that have been dormant for 20+ years. We have not had armor that fought "one or two tanks, surrounded by infantry, carefully nosing forward along a jungle track" to quote Field Marshal Slim of Burma. Not since Vietnam has American armor done this sort of close infantry support.

This is not an insurmountable problem. Most of the tactics used by tank-infantry teams in WWII, Korea, and Vietnam are still applicable today. There is certainly no shortage of documentation.

The assault gun itself does lack one feature that has been eliminated in our most recent armored vehicle designs. That is the external phone. The kind of fighting this vehicle is likely to do could be quite close in nature. It may not be the healthiest thing in the world for an infantryman to stand next to a CCVL and talk to the TC. Providing a phone would allow an infantryman to direct the assault gun's fire while keeping in cover behind the vehicle. It should also allow the vehicles to be included in an infantry phone hot loop. Target designation is the big problem when fighting close-in with infantry. Assault gun units and the infantry they support should work out SOPs in which the infantry marks targets with either smoke or tracer. This designation, combined with verbal instructions over either FM or external phone, should be sufficient to get rounds on target.

In addition, infantry could be ahead of the vehicle to either side as part of its security. Both the infantry and the assault gun crews will need to be trained about the hazards of the 105-mm gun so that the infantry security does not inadvertently mask the assault gun's fire.

In another probable use of the assault gun in support of infantry, fighting in a MOUT environment, the assault gun crew will have to train at firing at targets that are very small and normally within 500 meters. They will have to do this while exposing as little of their vehicle as possible for the least amount of time. Although the present tank gunnery tables give the fledgling AG battalion a basis to start from, I feel that we should add some special infantry support tasks. There should be a vehicle battle run through close terrain with an infantry platoon that designates targets. (Battle "run" is a misnomer, since it would be done at a walking pace.) The accompanying infantry would make contact and designate with tracer smoke and verbal instructions. There would be a day and night phase, with thermal targets representing men in the embrasures of camouflaged bunkers.

There should also be a MOUT battle run, but this would probably have to be fired with a subcaliber ammunition. The cost of rebuilding a MOUT site after using main gun training rounds a few times would no doubt be prohibitive. The range could be a simple version of a maze of "street fronts," similar to a Hollywood lot. The assault gun would negotiate it using an infantry squad to designate targets at ranges of 50-500 meters. Since only subcal ammunition would be used, the range would have a fairly small fan (all second or third story targets must be positioned to ensure that the arc of the bullets do not endanger overflight). The assault guns should participate in live fires with infantry units on as many occasions as possible. They should also train together as much as possible. Infantry must be familiar with the capabilities and limitations of assault guns. In particular they should be acutely aware of the security limitations of a three-man crew. There should be a company of normal attachment dedicated to each brigade, and this company should not change. Every infantry platoon and company in the brigade should be familiar and comfortable in working with assault guns. The assault gun company commander should be included in all training meetings at brigade. They have to be tight.

In closing, I can only say that the Armored Gun System has been a long time coming and was long overdue. We now have the opportunity to make up this shortfall in the structure of our rapid deployment forces and improve their capability exponentially. We could have used them in Somalia. They would have saved lives. There will be other times. Let's be ready.

Major Martin N. Stanton received his Infantry commission in 1978 from Florida Tech. He has served as a company XO with 1st Infantry Training Brigade at Ft. Benning; rifle and TOW platoon leader with 1-9 Infantry in Korea; asst. G3 staff officer with 9th ID, and commander, D Co, 2-2 Infantry, both at Ft. Lewis, Wash.; company and S3 observer/controller at the NTC at Ft. Irwin; senior brigade advisor, 2d Saudi National Guard Mech Brigade, Hofuf, Saudi Arabia; and as S3, 2-87 Infantry, Ft. Drum, N.Y. His combat service includes the Gulf War in 1991 and Somalia 1992-93. He is currently at the College of Naval Command and Staff, Newport, R.I.

What's Your Next Move?:

The Ins and Outs of the Armor Enlisted Assignments Process

by Sergeant First Class Michael R. Laney, Captain Joel C. Williams, Master Sergeant Curtis C. Brown, and Master Sergeant Joseph S. Woytko

Home is where the Army sends you. Whether you agree that your current or proposed assignment is home, you can't ignore the fact that your assignment is a very important part of the lives of you and your family. The career advisors here at the Armor Enlisted Assignments Branch of the Total Army Personnel Command (PERSCOM) also understand the importance of directing you toward the right assignments. This article was prepared to give the average enlisted tanker, scout, and armor senior sergeant an insight into the assignment process so that you can effectively work with us in processing your next assignment.

Armor Branch is the career branch for Career Management Field (CMF) 19 and is located in Alexandria, Virginia. Our office only deals with enlisted assignments and issues.

The military personnel include the branch chief (an Armor captain); a senior career advisor (a master sergeant with PMOS 19Z) who controls SFC(P) and MSG/1SG assignments and functions as the branch NCOIC; and two career advisors (sergeants first class with PMOS 19D and 19K) who control PVT through SFC assignments for the respective MOS. The civilian staff include a civilian supervisor, three assignment managers, a schools manager, and a clerk-typist.

Many factors come into play when determining a soldier's assignment, the most critical being the needs of the Army. Before an assignment can be made, a valid requirement must exist for a particular type of soldier at a given installation. Many installations have shortages of certain types of soldiers, but this in itself does not constitute a requirement. Requirements are derived from the number of soldiers authorized, the projected number assigned, the distributable inventory of the MOS and grade, and the unit's priority of fill, based on its mission. We often get calls from soldiers with 'letters of acceptance' from certain units, but these letters have no real value in determining a requirement. Real requirements are generally determined by PERSCOM's Enlisted Distribution Division which verifies and validates requisitions for soldiers. These in turn get filled by Armor Branch. Because valid requirements change, timing makes a big difference in the availability of assignments.

Once a requirement has been validated, Armor Branch is then responsible for filling the requisition with a qualified soldier. In determining qualification, we ensure that the soldier's PMOS (including additional skill identifiers and skill qualification identifiers) and grade match the requirement. In some situations a soldier might fill a higher grade position if he's promotable. In most cases, a soldier's assignment will not be changed if he becomes promotable after assignment instructions are issued.

We also check to ensure that the soldier is PCS-eligible. By PCS-eligible, we mean the soldier, if he is overseas, has a DEROS date compatible with the assignment. He must have a minimum of two years time on station as of the report month if he is in CONUS and being considered for an overseas assignment (one year for first-term soldiers). Or he must have a minimum of four years time on station as of the report month if he is in CONUS and being considered for another CONUS assignment. Waivers to PCS-eligibility can be obtained from the PERSCOM Combat Arms Division Chief through the Assistant Secretary of the Army for Manpower and Reserve Affairs when certain situations warrant an exception. Such waivers are generally obtained to move soldiers into or out of low-density positions or special duty assignments. PCS-eligibility also accounts for stabilizations. Stabilizations are our promise that a unit can keep a soldier for a certain length of time, generally no more than two years from the beginning of the stabilized period. The most common problem with stabilizations is that units fail to request a stabilization until after the soldier has received assignment instructions. If you have been selected to attend master gunner school or to serve in a first sergeant position, check with your unit about requesting a stabilization.

Another major factor in making an assignment is the soldier's professional development. The Armor Enlisted Professional Development Guide, which is published by the Armor Center, identifies the 'Professional Development Triangle' which places professional development responsibility on the soldier, the soldier's commander, and us, the career advisors. The guide

further provides guidance on the assignment and career progression of Armor soldiers. We try to make assignments consistent with the recommendations outlined in the guide and on the Armor career map. This means avoiding repetitive TDA or staff-type assignments, selecting soldiers with recent troop leadership time commensurate with their grade for special duty assignments, making decisions that provide the force with well-rounded Armor soldiers, and enhancing the promotion potential of soldiers. Soldiers who have shown a willingness to pursue self-development through military and civilian education, GT score improvement (most special duty assignments require at least a GT of 100), enrollment in the Excellence in Armor Program, and other self-improvement programs typically have an edge over those who don't. All too often, we get calls from soldiers who are resigned to never seeing another promotion. This lack of interest in self-development does not relieve us of our responsibilities to integrate professional development into the assignment process.

With the recent reductions in the Retention Control Points for enlisted grades, retainability has become a more important assignment factor. Generally, a soldier must have two years retainability for a CONUS-to-CONUS PCS, 13 months (from DEROS) for a long tour overseas-to-CONUS assignment, and seven months for a short tour overseas to CONUS. Assignments are not made to overseas short tour areas unless the soldier also has enough retainability to complete the tour and to return for another CONUS tour. Retainability only means the maximum amount of time the soldier is eligible to reenlist for, not the amount of time to his current ETS (except first-term soldiers).

Soldiers who refuse to reenlist for an assignment are counselled by the installation and required to sign the Declination of Continued Service Statement which precludes future reenlistments. First-term soldiers have different retainability criteria. First-termers must have retainability to complete the appropriate tour requirement as of their ETS dates. Consequently, many first-termers who have their initial tours in CONUS are precluded from overseas selection. The important point here is that if a CONUS-based first-termer desires to go overseas, he can increase his chances immensely if he submits a request that expresses his willingness to extend or reenlist for the assignment.

The Exceptional Family Member Program and the Married Army Couples Program are two programs that facilitate family welfare in the assignment process. These generally don't have much of an impact on the assignment of soldiers because most medical problems of family members in EFMP are treatable at most installations and most career branches are cooperative in coordinating joint domicile assignments for MACP soldiers.

There has been some difficulty in coordinating EFMP care in Europe because of the realignment of many of the medical care facilities there. This causes delays in the departure of Europe-bound soldiers, especially if the EFMP enrollment is not made until the soldier outprocesses the losing command. In some cases, family travel is denied and soldiers are required to proceed on unaccompanied tours. If this happens, contact Armor Branch to determine the possibility of a change in your assignment.

The MACP ensures that a joint domicile assignment, although not guaranteed, is considered in the assignment process. It is essential that married spouses get enrolled in the program as soon as possible after marriage and that they don't initiate personnel actions that reduce their chances of a joint domicile assignment being made, such as reenlisting for an installation that does not have adequate vacancies for the spouse. We at Armor Branch make every effort to provide assignments that keep families together and provide adequate medical services.

A soldier's preference, believe it or not, is also a major consideration in his assignment processing. With strict rules on the processing of deletions (cancellation) of assignments, you increase your chance of getting what you want if you make your preference known before an assignment is made. To ensure we know your preference, update your CONUS and overseas area of preference through SIDPERS by submitting a DA Form 4187 requesting your preference, and call your career advisor. The areas of preference should be updated whenever the form is not current. The DA Form 4187 or the phone call to your career advisor is best received when you are eight months short of DEROS, if overseas, or as you approach two years time on station if in CONUS looking for an overseas assignment. When expressing a preference, it is very important that you select locations where there is a large density of Armor soldiers and an abundance of positions commensurate with your particular development needs; otherwise you force us to make a realistic decision for you.

One frequently misunderstood factor in assignments is the Homebase and Advanced Assignment program. When we assign a soldier with the rank of sergeant through master sergeant to a short tour area, we project his return assignment at the same time. Although many soldiers elect not to participate in the program, there is no assumption that the soldier will return to his current station after the short tour. Quite often, because of installation strength projections, the soldier will still be assigned to the originally selected installation. To increase your chances of being assigned a homebase or advanced assignment of your choice, keep your preferences up to date. If you volunteer for a short tour, express a preference for a return assignment on the request. Pinpoint assignments to long tour areas are made by the gaining command and coordinated directly between the command and the losing installation; we have no impact on pinpoint assignments.

We often get assignment requests based on personal hardship reasons. While we try to assist all soldiers in going where they want and need to go, we can't always make assignments based solely on hardship. Soldiers with extreme hardships should contact their chain of command and MILPOs for assistance in processing compassionate reassignment requests or requests for assignment deletion. The Compassionate Review Panel reviews and determines whether to ap-

prove or disapprove compassionate reassignment requests. When a request is approved, the Compassionate Review Panel coordinates the compassionate reassignment with Armor Branch. It is rare that a soldier will be assigned to a location that has no authorized position for his PMOS. Now we will discuss the tools we use to make assignments.

The primary tool we use at Armor Branch is the Enlisted Distribution and Assignment System (EDAS). It is an automated system that uses soldier information in the Personnel Database (PERDB). The information is supplied to PERDB through the SIDPERS transactions that are submitted by the MILPO. We use this system to select soldiers for assignments based on PCS-eligibility and certain qualifications required for the assignment. Once the right soldier has been selected for the right requirement, he is assigned a requisition number and the assignment is entered into EDAS. If the soldier is being sent to a school enroute to his next assignment (master gunner, tank/scout commander certification, airborne (19D only) etc.), he will be scheduled for the course and special instructions will be supplied in the assignment instructions. The assignment instructions will transmit over the following weekend on a Centralized Assignment Procedure (CAP) cycle to the MILPO who will use the assignment instructions to conduct a levy briefing and issue orders to the soldier. Before assignments are made on staff sergeants through master sergeant/first sergeant, the soldier's Career Management Information File (CMIF) is reviewed. The CMIF contains all hard copy NCOERs signed by the soldier since he became a staff sergeant (they are forwarded to us after posting in the microfiche at the Enlisted Records and Evaluation Center at Fort Benjamin Harrison, Indiana), the most recent photo of the soldier, DA Form 1059, DA Forms 2A and 2-1, reviewed by the soldier's most recent DA board, and recent assignment documentation such as DA Forms 4187. Since soldiers in the ranks of private through sergeant have no CMIF, it is particularly important that they ensure their areas of preference are updated through SIDPERS and submit DA Forms 4187 in a timely manner. One component of EDAS is an automated assignment nomination module that compares validated requisitions with available soldiers. In this system, soldiers are given scores based on their qualification data in PERDB. Such data includes areas of preference, PMOS, grade, ASI/SQI data, DEROS, time on station, etc. Once a soldier is selected for an assignment, the career advisors verify eligibility and accept or reject the system's nomination. Generally, if a soldier is eligible for the assignment, it will be accepted. Again, this emphasizes the need to have accurate preferences on file.

Now that you have a basic understanding of the assignment process, you may be wondering what types of assignments are out there. Since we assume most Armor soldiers are aware of the locations of various Armor units, we will only concentrate on low-density and special duty assignments, such as drill sergeant duty, recruiting, readiness group advisors (advisors to Reserve Component units), observer controllers at the NTC and CMTC, Inspector General duty, equal opportunity duty, range control duty at non-Armor installations, and special management command positions in Kuwait, the On-Site Inspection Agency in Frankfurt, and the Army fielding team in Egypt and Saudi Arabia. These positions are highly competitive and many contain specific qualification standards (most are outlined in AR 614-200 in the Enlisted Ranks Update). If you are interested in these types of assignments, it is critical that you have recent proven performance in the troop leadership position commensurate with your grade and that you meet all of the qualification criteria. Armor Branch also publishes the Armor Branch Newsletter that advertises different programs and vacancies for which we are seeking applicants.

While the assignment process as a whole is fairly complex, it is not beyond reality to have a profound impact on your own future by keeping yourself highly competitive, being realistic in your preferences, and ensuring your preferences are made known prior to receipt of assignment instructions. You can correspond with us at Commander, PERSCOM, ATTN: TAPC-EPK-R, 2461 Eisenhower Ave., Alexandria, VA 22331-0452. Tel: DSN 221-9080/COM (703) 325-9080.

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Captain Joel Williams was commissioned in Armor in December 1985 from Jacksonville State University. He served with 2d AD (Forward) and commanded M1A1, M3, and student units at Fort Knox. He is a graduate of CAS^3, IOAC, and AOBC and is currently serving as the Enlisted Branch Chief, Armor Branch, PERSCOM.

Master Sergeant Curtis Brown is currently assigned as the Senior Career Advisor, Armor Branch, EPMD, PERSCOM. His past assignments have been with the 11th ACR and 3d ID in Europe as a scout squad leader, scout platoon sergeant, cavalry platoon sergeant, regimental master gunner, and first sergeant.

Master Sergeant Joseph Woytko is currently assigned as the MOS 19D Career Advisor with Armor Branch, EPMD, PERSCOM. His previous assignments have consisted mainly of duty in divisional and regimental cavalry units, mainly in the 2d ACR. He served as squad leader, section sergeant, platoon sergeant, first sergeant, Bradley master gunner, and drill sergeant.

Armor Officer 2000

by Major Douglas J. Morrison

"Practice those things in peacetime that you intend to do in war."

General George S. Patton, Jr.[1]

As the downsizing of the Army continues, training and preparation for war grow ever more important. Discussion has focused on base closings, personnel cuts, reduced budget authorizations, and unit standdowns, but very little debate or thinking has gone into personnel assignment policies and officer professional development. The Army continues to maintain an officer assignment program that focuses on short assignments and certain "gates" to pass through, such as the Officer Basic and Advanced Courses. With growing equipment sophistication, increased mission requirements, and reduced training dollars, Armor officers at the company-grade level require stricter professional development standards. Unfortunately, current Army officer Professional Management Division (OPMD) and manning requirements preclude the Armor Force from making the necessary institutional changes. This paper identifies shortcomings in the tactical and technical proficiency of Armor officers, then discusses a remedy — mandating specific duty assignments and establishing mandatory assignment duration for all Armor company-grade officers.

The time for everyone to have a fair chance and to command are over. The Army and the Armor Force must focus on maintaining a tactically and technically proficient officer corps, ready for future battles, the composition of which we cannot predict.

Problem

General Sullivan, the Army Chief of Staff, has stated we must have a versatile and balanced force, which is "smaller, more modern and technologically overmatching."[2] But accomplishing this will require a change in philosophy and application.

The current DA PAM 600-3 contains the appropriate time lines, schools, and professional development "gates" that are required to advance. It is used as a template to guide personnel managers in assignments. Many variables affect assignments, to include Army (OPMD) requirements, location/time on station, field commander demands, officer preference, and professional development.[3] Given these considerations, nothing addresses the need to have trained, competent company-grade officers, ready to go to war.

In reality, it is a "unit problem." Commanders must train their units and officers. But in order to meet the needs of the personnel managers and to have the "right jobs," officers are moved to new positions before they are proficient in their last one. With increasingly complex equipment and other technological innovations coming with the digitization of the battlefield, officers must learn quickly so they in turn can lead their units effectively. Unless we implement mandatory requirements, a junior officer serving as a platoon leader for only a year may never have a gunnery or a Combat Training Center (CTC) opportunity as a platoon leader. The qualifications of any professional will deteriorate over time if not practiced. After all, "The management of violence is not a skill which can be mastered simply by learning existing techniques. It is a continuous process of development...."[4] What is required, then, is an institutional and organizational change to the professional development models.

Armor Officer 2000

Under current manning requirements and the officer distribution plan (ODP), the concern is to fill personnel shortages and to "check the block" for every officer. Emphasis must shift to having trained, experienced, proficient junior leaders, capable of leading in combat at the company-grade level. The idea of "fairness," "equity," or "walking in to a branch qualifying job" should become history. Focus should shift to the warfighting skills we'll need on the technologically advanced, lethal battlefield of tomorrow. Only those proficient within the profession would be selected to become combat leaders. With our smaller force structure and these considerations, the following solutions should be implemented to achieve Armor Officer 2000.

Every Armor lieutenant would attend the Armor Basic Course (AOBC), a leadership development course (Airborne, Ranger, or Air Assault), and then to his first duty assignment. During this first assignment, every Armor officer would serve two years as a platoon leader in either a cavalry or tank platoon. Upon completion of platoon leader duty, he would serve two years as a company/troop executive officer or specialty platoon leader. The only exceptions to this policy would be based upon an emergency, or contin-

gency operations that require longer or shorter tours of duty.

At this point, the officer would be in commissioned service for four to four and a half years and would be ready for the Armor Officer Advanced Course (AOAC) or equivalent. The advanced course would expand to include what is now the Junior Officer Maintenance Course and the correspondence portion of CAS^3. Further, the advanced courses would add emphasis on tactical dynamics and theory. Clausewitz outlined the powers of intellect that war requires. Currently, company grade officers receive little instruction on the "fog" and "friction" of war. Given the complexity of the future battlefield, the fact that "three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty"[5] a shift in focus must occur. The advanced officer courses actually prepare young officers for company/troop and battalion/squadron command. An officer receives his last formal tactical instruction in the Army during this time. The instruction must include discussions on friction and the fog of war, battlefield stress, the isolation of soldiers, and the moral cohesion required to maintain an effective command on the future battlefield.

Upon completion of the advanced course, the Armor officer would attend CAS^3. Too much time is now spent training officers to be staff officers *after* they have been commanders or staff officers! Another option would be to transfer CAS^3 training to the Advanced Course since it is already a permanent change of station move (PCS). Since other branches, including Infantry, Aviation, and Field Artillery, send officers to Fort Knox, this option still maintains the branch interaction component of CAS^3 at a lower cost. After completion of CAS^3, the officer would go to either an operational (S2/A-S3) or logistical (S1/S4/BMO) position at the battalion/squadron level or at brigade. Then, after one year in an operational position, the officer would switch to a logistical position, or vice-versa, because officers must understand both the logistical and operational requirements of our new, sophisticated equipment and changing doctrinal applications. Upon completion of these operational and logistical assignments, the officer would be considered for company or troop command.

Officers would be locked in for a two-year command tour, and the focus on tactical and technical proficiency would remain key. Further, this would standardize command tours throughout the Army — the command tour of a company commander or division commander would be the same — two years. During this time, the officer should become proficient in all facets of battalion/squadron operations, including administration, gunnery, maintenance, and tactical applications. Upon completion of the two-year command tour, the officer would then be given a nominative assignment, based on Army requirements.

If the officer is qualified to command, but not a tactical unit, the battalion and brigade commanders could recommend assignment as an ROTC or recruiting company commander or a transfer to the Reserve for continued training and development. If the officer is found to be unable to lead soldiers, his file must be considered for release from the service. If retained, the officer could be transferred to a position more fitting the individual's skills, such as the PAO or Finance Corps.

The future of the Army and the Armor Force will be a challenging one. The one constant will be continued uncertainty. No longer can we look at personnel assignments, professional development, and warfighting skills separately. Operations JUST CAUSE and DESERT STORM illustrated the type of future operations Armor leaders will execute. Complex, violent, and decisive operations using advanced technological equipment will be the norm. Our current personnel policy of broad experience for all officers, without concern for warrior proficiency, must go the way of the Cold War army it was designed to support.

Not every officer will make the transition, but we owe it to our soldiers and the nation to have the best, most experienced and proficient officers available. No longer can we expect time to build up or train up, as was the case in Operation DESERT SHIELD. Based upon our new focus as a "strategic force for decisive victory,"[6] our innovation and experimentation must begin with professional development and officer assignments. Now is not the time for timid institutionalism. The Armor Force must break the paradigm and focus on training determined, warfighting, company-grade officers, proficient in the Combat Arm of Decision.

Notes

[1]General George S. Patton, Jr., *Leadership.* Edited by Robert A. Fitton, (Boulder, Colo. Westview Press, 1990) p. 289.

[2]General Gordon R. Sullivan, "Moving into the 21st Century: America's Army and Modernization," *Military Review,* July 1993, p. 3.

[32]Colonel Stephen E. Wilson, "Ruminations of a Branch Chief," *ARMOR,* September-October 1991, p. 43.

[4]Samuel P. Huntington, "Officership as a Profession," *War, Morality, and the Military Profession.* Edited by Malham M. Wakin, (Boulder, Colo. Westview Press, 1986), p. 29.

[5]Carl von Clausewitz, *On War.* Edited by Michael Howard and Peter Paret, (Princeton, N.J.: Princeton University Press, 1984), p. 101.

[6]Sullivan, p. 11.

Major Douglas J. Morrison served as a platoon leader and company XO with 2-66 Armor, Garlstedt, Germany; asst. G3 operations officer, 2AD (FWD), Garlstedt, Germany; S3 Air for 1-63 Armor and 2-34 Armor, and as commander, D/2-34 Armor, 1st ID (M); troop commander and squadron S3 for 1st Squadron, 4th Cavalry during Operations DESERT SHIELD/DESERT STORM; and as asst. observer controller with the Battle Command Training Program. A graduate of the Armor Officer Basic and Advanced Courses, CGSC, and SAMS Class 1993-94, his next assignment will be to G-3 Plans, 2d Infantry Division, Korea.

The Green Tabbers of Force XXI

by Lieutenant Colonel (P) Martin E. Dempsey, Armor Branch Chief

I am heartened to note the ongoing dialogue about the professional development of our officer corps. These days, it is easy to become caught up in the excitement and newness of information age technology, but we must never forget the development of the men who will employ it. The officers who will command Force XXI are leading our platoons today. The challenge to ensure their professional development toward that end is an intimidating one.

The authors of two recent articles in *ARMOR* magazine — MAJ Morrison in this issue and CPT Salerno in the May/June issue — are concerned that we are not adequately grounding our future armor leaders in the skills of their profession. MAJ Morrison questions assignment policies that attempt to branch qualify everyone minimally and end up branch qualifying no one satisfactorily. CPT Salerno questions assignment policies that attempt to generalize the experiences of tankers and cavalrymen at a time when specialization seems to make more sense. Both authors lament our inability to leave officers in assignments at the company and battalion level longer.

My personal view is that we can never be immersed enough in experiences that will make us better warfighters at the tactical level. I share the concerns of MAJ Morrison and CPT Salerno. I am concerned that personnel turbulence may negatively affect our ability to assimilate leaps of technology.

I am even more concerned at the effect personnel turbulence has on the ability of leaders to mentor their subordinates. After all, it is difficult for a major to develop a rapport with young captains and lieutenants in the 12 months we allow him to remain at the battalion level. It is even more difficult for the major to release the reins to his subordinates when he realizes that he has only a fleeting opportunity to demostrate his ability to get the job done at the battalion level.

Without question, spending more time is better than spending less time at the tactical level. I would think less of anyone wearing Armor brass who would suggest otherwise.

However, we are an army in transition. The mission to transition properly is at least as important as the mission to remain combat ready. In fact, they are really the same mission. Transition began in 1989 and will likely last until 1999. At some point in the future, authorizations for officers will equal the available inventory of officers. At this moment, authorizations far exceed inventory. The result is a sharing of shortages. This is the Officer Distribution Plan (ODP) to which MAJ Morrison referred in his article.

If you agree that this is a transitional period, you must also agree that we should not base our assessment of the effectiveness of personnel assignment policies on some of the things that occur during this period.

We are not simply downsizing in the manner of past postwar periods. We are truly restructuring. It will cause those of us who grew up in the Cold War period some anxiety. It may even challenge our understanding of branch.

We do not know how much time will be required to sustain proficiency and to grow professionally in the digitized force. There are studies ongoing in the battle labs and in the combat training centers intended to answer that question and many others. There are studies ongoing in the personnel community seeking to redefine the officer personnel management system (OPMS) and officer professional development (DA PAM 600-3). In the meantime, we will continue to provide every armor officer the opportunity to become branch qualified within our ability to do so and until a selection board — not an assignment officer — declares him no longer competitive for command.

There have been many comparisons drawn between this period of transition and others in our army's history. One particularly appropriate comparison was adopted as the theme of this year's Armor Conference: the comparison between our current period of great technological change and the period 1934-1941. I think another telling comparison can be made between our current period of uncertainty and the period 1890-1900.

The last decade of the nineteenth century was a decade of great promise and, at the same time, of great anxiety. The Chicago World's Fair placed the great technological wonders of the period on display, but throughout the country there was great skepticism about the revolutionary — not evolutionary — movement from an agrarian to an industrial society and the challenge to traditional values that many saw as a direct result.

Imagine the concern among the young captains of cavalry who served their army during its search for an identity in this period. Our young captains of armor and cavalry have similar concerns as we approach the end of the twentieth century. Now, however, is not the time for dramatic policy changes.

Now is the time for selfless service to an army in transition.

I applaud the efforts of MAJ Morrison, CPT Salerno, and others like them who have entered the dialogue about the course of future officer professional development. Keep it up!

Lieutenant Colonel (P) Martin E. Dempsey is the Armor Branch Chief, Total Army Personnel Command. He is a 1974 graduate of the U.S. Military Academy and has served in troop assignments with 2d Armored Cavalry Regiment, 4th Infantry Division, 3d Armored Division, and 1st Armored Division.

LETTERS *(Continued from Page 3)*

ROGUE in mind. The support of a very capable heavy force to the U.N. operation in Somalia is a very good example of the deployment capabilities of today's M1A1-equipped heavy force.

JAMES M. WARFORD
MAJ, Armor
Leavenworth, Kan.

Where Is the XO?

Dear Sir:

The article "M1A2 Tank Distribution" by Lawrence G. Vowels (March-April 1994) was very informative, but one essential item was missing from all the proposed distribution plans. Where is the tank company executive officer?

The author proposed three distribution alternatives based on a company-size organization: All tanks are M1A2; the company commander, platoon leaders, and platoon sergeants have M1A2s; only the company commander and platoon leaders have M1A2s. Again, where is the XO?

Since at least the mid-80s, tank companies have gone to war using the "Fighting XO" concept, where the XO has the same type of combat vehicle as the rest of the company. Even the infantry have adopted this tried and proven organization for their M2 Bradley companies.

The XO traditionally operates on the TF command net and monitors the company command net, collecting and forwarding reports and coordinating with other units within the TF. Operating in this manner effectively frees the company commander to fight his company. Since the XO is also the second in command, he must also be prepared to take command if the company commander is disabled or is too involved with his own survival to control the company. He must have a tank, just like his commander.

From what I have read, the M1A2 is a fantastic fighting machine that will allow our armored forces to continue to dominate the battlefield of the future. I fully agree with the author's conclusion that M1A2-pure tank companies are the correct answer to the fielding of this system, but no matter how sophisticated the tank's electronics package is, it cannot replace the company executive officer. The last thing the commander needs is to be so wrapped up with his vehicle and passing information that he can't fight the company's battle.

JOHN D. KEITH
CPT, Armor
2-64 Armor
Schweinfurt, Germany

More Reaction to the "CAT Tank"

Dear Sir:

After reading "Armor in the 21st Century" by MAJ Spurgeon and Mr. Crist (Jan-Feb 94), and the two letters by David Nilsen and "Beau" Bergeron in the May-June 1994 issue of *ARMOR,* which commented on the "21st Century" article, I would like to make some statements of my own. I've been serving on M-48s and M-60s with my current battalion for nearly 16 years now, with over two years of command time with one of its tank companies. As an avid *ARMOR* magazine reader for basically the same number of years, I discovered an earlier article (Mar-Apr 1987 *ARMOR*) concerning the same topic as in "Armor in the 21st Century" namely, the combined arms tank (CAT), by the same authors, albeit, a captain instead of a major at that time. By reading both stories, I found that MAJ Spurgeon and Mr. Crist are NOT against tanks (being obsoleted by PGMs) as "Beau" Bergeron observed in his letter; the authors are against the main battle tanks, as compared to a combined arms tank.

CPT RICHARD G. GEHRMANN
Cdr, C Co, 1-149 Armor
Boulder Creek, Calif.

War Isn't Value-Neutral

Dear Sir:

In the review of *Panzerheld* by Dr. Gregory T. Jones (*Books*, March-April 1994), SFC John T. Broom states that some members of the SS, "misguided though they might have been, were truly the best of men and soldiers." I do not challenge the military competence and energy of these units, or of the value of study of their operations, but it seems judicious to ponder the phrase "best of men" when applied to the Nazi military elite.

After half a century, we have apparently reached a time wherein we cut more slack for the enemies of our fathers than careful reading of the record warrants. The SS were political soldiers and, like the NKVD, inoculated with a racial and pseudo-religious virus antithetical to the foundations of Western culture. It is wrong to suggest that, motivated by such hatreds and perversions, that they were "innocent as any American unit." War is, of course, not a tea party, and to expect men to intimidate, destroy, and kill (and to suffer the same) while maintaining the disposition of a Saint Augustine is unreasonable. But to add to natural human weaknesses the philosophies of the SS is to guarantee the sorts of barbarism well associated with those units and is not an approach calculated to produce the best of men.

The development of military expertise requires and rewards the study of the past without distortion or deletion. Apologists for the SS are no less guilty of omissions and evasions than are apologists for the system of the USSR. In both cases, the political, ethical, and moral components of these societies led to their demise. In neither instance did military competence ensure survival. Both built a military house of cards upon a society in which the best of men were intimidated into silence, imprisoned, or killed. Thankfully, that has never been the American experience. However, if our society, and the soldiers drawn from it, should ever accept a value neutral moral standard from which to judge the merits of military operations, then successful or not, the reputation of our armed forces would be vulnerable to the sorts of stigmas rightly attached to some of our former enemies.

JEFFREY OJEDA BELLINGER
Student of History
University of Wyoming
Wheatland, Wyoming

The Armor-Antiarmor Arms Race

Dear Sir:

I read with interest the article, "Armor in the 21st Century," in your Jan-Feb 94 issue. With nearly 30 years in the military, and over 10 of those years in an antitank platoon, I sometimes find it humorous to see and hear how tank men continue to strive for more and more armor. In my antiarmor experience, it seemed that every time the tankers came up with more and better armor, we'd come up with a weapon to defeat it. The "arms race" goes on, I guess. However, I would like to make a couple of observations on the subject, if I may. Like a submariner, who considers anything NOT a submarine to be a "target," likewise we antitank men consider anything on tracks with a turret to be a "target," and the bigger the better! There is nothing more enjoyable to a true tank killer than hunting tanks! They are the ultimate game.

However, MAJ Spurgeon and Mr. Crist's new proposed combined arms tank might pose a serious threat to future antitank soldiers. All tanks, even the much vaunted M1 and "new" AGS, are relatively blind when compared to an individual fighting man. Any tank foolish enough to attack without infantrymen would indeed make for some good sport shooting. If the armor attacks with infantry, then we (antitankmen) can be searched out, surprised, or otherwise attacked. Even knowing that infantrymen are present with the enemy armor poses a psychological threat to us. True, we can knock out a main battle tank, or a CAT (if one

existed), but we would fear the CAT the most, because of its infantry. Presuming that both the MBT and the CAT are basically equal in both armor and gun, then clearly the superiority of carrying its own infantry makes it a bigger threat.

Tanks are fun, so is shooting at them (from an antiarmor perspective), but if and when the CAT is ever brought on line, things may start to get serious.

MSG RICHARD L. TOWNSLEY
MI, CAARNG
San Jose, Calif.

Benefits of On-Board Infantry

Dear Sir:

With the exception of his paragraph about PGMs making the tank obsolete, I agree wholeheartedly with "Beau" Bergeron's letter (May-June 1994 *ARMOR*) concerning his comments about "Armor in the 21st Century" (Jan-Feb 94 *ARMOR*). After reading MAJ Spurgeon and Mr. Crist's article several times, I concluded that the story was primarily about a combined arms tank, and only partially about reorganization, etc. My interpretation of their article is that PGMs (precision guided munitions) have basically made the MBT obsolete, and since a main battle tank or a combined arms tank (which offically doesn't exist — yet) can both be defeated by PGMs, then why not use an infantry-carrying tank, since an MBT cannot operate without infantry anyway? Sounds pretty clear to me.

DAVID ROBERTS
MAJ, EN, CAARNG

What Happened at Montrevel

Dear Sir:

I am writing in response to the article authored by Dr. A. Harding Ganz, entitled "The 11th Panzers in the Defense, 1944," which appeared in the March-April 1994 issue of *ARMOR*. Specifically, I would like to address the comments made on page 29 of the article which refers to the actions of the 117th Cavalry Recon Squadron at the French town of Montrevel on 3 September 1944. In his article, Dr. Ganz states, "The 117th Cavalry Recon Squadron maneuvered to Montrevel to the north, but Bode's Battalion 11 rolled up from Bourg on 3 September. Troops A and B were mauled, and the survivors surrendered. To GIs who ran afoul of the "Ghost Division" it was no "Champagne Campaign"."

I realize that the subject of Dr. Ganz's article was the 11th Panzer Division and its exploits in France following the Normandy breakout. However, I do take exception to the fact that Dr. Ganz does not include a little more about the battle at Montrevel and the heroic actions by members of the 117th Cavalry Recon Squadron on September 3, 1944. Far from being "mauled," the 117th Cavalry Recon Squadron had "carried out ill-conceived orders; they had fought courageously to hold an untenable position" as described in Arthur L. Funk's account of the battle at Montrevel, "Mandate for Surrender." I refer the reader to this article for a complete and accurate account of what actually happened.

Troop B, commanded by CPT John Wood, was ordered to "seize and hold" Montrevel by LTG Lucian Truscott, commanding general of the VI Corps, as part of Task Force Butler. At the time the order was given, Troop B consisted of 124 men, 10 armored cars, and 18 jeeps armed with machine guns or mortars. Troop A, under the command of CPT Thomas Piddington, was 200 miles to the east, patroling the Italian Border, while Troop C was attached to the 179th Regiment and was stationed 30 miles away in the Meximieux area. LTC Charles Hodge, commander of the 117th, protested, but corps headquarters refused to change the order. Troop A was released from border patrol to join in the mission, and drove all night in the rain to reach the squadron headquarters. Unfortunately, the entire troop did not arrive intact, as many vehicles were disabled along the way due to mechanical problems.

Troop B entered Montrevel and captured about 75 German soldiers still in the town. The troop established a defense of the town and waited. The 11th PD responded by sending Bode's Battalion 11, equipped with Mark V Panther Tanks, to counterattack and retake the town. The battle lasted all day, with many heroic acts performed by the members of the squadron in attempting to defend the town. A number of decorations were awarded for these actions, including a number of DSCs and the Medal of Honor. Requests for reinforcements were denied, and the squadron was left to its own by the corps. In the end, the Germans captured 102 Americans, including 31 wounded. LTC Hodge, in his memoirs, writes, "It is noteworthy to note here that the commanding general of the 11th Panzer Division sent me a message through the doctor we had left in Montrevel. The CG said, 'We just don't believe that there is a small armored force here. We believe it is a big operation, and when we found out that it is only a squadron, we were utterly amazed, and would you please convey my congratulations to your commanding officer, who is putting up the strongest fight we have had in the war'."

I hope this sheds a little light on what actually happened at Montrevel that September 3, 1944, and present this as a reminder to all who approach discussing a battle from only one side. The members of the 117th Cavalry Recon Squadron honored themselves that day by fighting a battle they had no hope of winning.

FOTINOS S. PANAGAKOS
CPT, MS, NJARNG
President,
117th Cavalry Assocation
Westfield, N.J.

The Author Replies...

Dear Captain Panagakos:

Thank you for your letter about the Montrevel fight reference my "11th Panzers" article (*ARMOR*, Mar-Apr 94), and for the copy of Professor Arthur Funk's excellent "Mandate for Surrender" article. I have corresponded with Professor Funk on a number of topics, though I would appreciate the date and name of the journal in which the article appeared.

I hadn't realized that anyone still believed that Troops A and B had *not* put up anything but a heroic fight at Montrevel, nor that they had *not* been given a "mission impossible." Weigley in his *Eisenhower's Lieutenants* (p.235) says the "cavalry clawed the Germans," and the U.S. official history *Riviera to the Rhine* (p.179) says the cav were "holding on as best they could and mounting counterattacks to keep the Germans off balance." It is not clear why General Truscott in *Command Missions* had been critical ten years after the battle; perhaps it reflects his frustration at finding his flanking moves constantly thwarted. As Professor Funk says, there is no justification for his remarks.

The official history (p.180) gives the cav losses as 20 jeeps, 15 armored cars, 2 light tanks, and casualties including 126 men captured. The Germans probably lost 1 tank, 2 armored cars, and 4 other vehicles. Truscott simply assigned missions to the 117th "that were beyond its capabilities." As I noted on my p. 29 about Recon Battalion 11's heavier fire power, "That consequent battle losses reduce the ability of recon units to carry out their primary missions has generated an ongoing controversy about the role and weaponry of such units."

I think it fully in character that the German colonel (Karl Bode) and the CG (Wietersheim) both complimented the cav on their stiff fight.

A. HARDING GANZ
Associate Professor
Department of History
The Ohio State University

BOOKS

The Army's Frank, Objective Account of the Gulf War

Certain Victory: The U.S. Army in the Gulf War by Brigadier General Robert H. Scales, Jr. Director - DESERT STORM Study Project, Office of the Chief of Staff, U.S. Army, Washington D.C., 1993. 390 pages.

Certain Victory is the first official history of the Gulf War operations and considers Operations DESERT SHIELD, DESERT STORM, and PROVIDE COMFORT. The project group's intimate familiarity with the Iraqi and Kuwaiti theaters of operation, in combination with exhaustive research, makes *Certain Victory* a readable and detailed work. A consistent focus on operational and tactical facets of Gulf War operations increases the book's readability. *Certain Victory's* objectivity and detail rank it among the best Gulf War histories yet produced.

Certain Victory is remarkable among other Gulf War volumes for its temerity in honestly addressing fratricide incidents and issues; its gritty focus on the sharp individual edge of combat operations instead of headquarters' wrangling; and (given the slant of other noteworthy Gulf War tomes) a remarkable lack of private agendas, personal biases, or axes to grind.

Produced by an eight-member research/writing team and three primary authors in the ranks of major through brigadier general, *Certain Victory's* narrative is terse and remarkably seamless — a tribute to General Scales' personal attention to the project. Vignettes from American, Iraqi, and coalition officers and men enliven and punctuate the text. The project's liberal employment of DESERT STORM combat arms officers as authors provides great authenticity of emotion and tone throughout the text. Nevertheless, *Certain Victory* relies solely on establishing the facts of events as closely as possible. Fratricide incidents, especially, often receive quite detailed attention.

Certain Victory's critical assertion seems to be that "Maintaining an immediately deployable capability for decisive land combat to end a conventional conflict successfully is the single most enduring imperative of the Gulf War" (pp. 359-360). Addressing strategic deployment considerations is not the work's greatest strength, however. In temperament, *Certain Victory* clearly prefers the perspective and judgment of the operational level commander, in place, on the ground, whose "senses, sharpened and on edge after... days of combat, (are) almost overwhelmed by... surreal and foreboding scene(s)" (321). It is the perspective of operational and tactical commanders, the men at brigade level and below, that *Certain Victory* prefers as historical reality, not the more remote, detached perspective of a higher headquarters.

Certain Victory is not perfect. An exhaustive order of battle annex would be an addition of inestimable aid to the book's value as a research tool. Given the unfettered access of the work's project group to official records, annexes could easily have provided unit listings and both deployment and redeployment dates for U.S. and coalition forces. While the book has detailed graphics, they wash out depicted objectives as the lines of coalition forces reach them. This hinders the sense of movement and continuity of effort the text works to sustain. It also makes appreciation of the speed, scale, scope, and range of advances harder to appreciate visually. The book's scope and detail also have a downside — at 360 closely written pages, it will take most serving Gulf War veterans longer to read about their war than it took them to win it.

An excellent and timely illustration of the U.S. Army's employment of the operational art, *Certain Victory* deserves attention from anyone interested in how we conduct ourselves operationally and tactically. *Certain Victory* is honest, comprehensive, and readable, I believe it is clearly the best of available Gulf War histories and recommend it unreservedly.

KEVIN M. RIEDERS
2LT, Armor
Ft. Polk, La.

Hoodwinking Hitler: The Normandy Deception by William B. Breuer, Praeger Publishing, Westport, Conn., 1993. 273 pages, $24.95.

It has become almost a cliché to state that a particular book is "a must read." Unfortunately, *Hoodwinking Hitler* is not one of these books, but it is a fun book to read and a fascinating look at Bodyguard, the intricate deception plans concocted by the Allied Powers to protect the secrecy of the Normandy invasion during June 1944. Through a variety of secondary sources, Breuer describes the personalities and plans that resulted in one of the most successful deception operations in military history.

Breuer is at his best when he reconstructs the activities of a vast coterie of Allied and Axis spies and double agents involved in some facet of Bodyguard. It is fascinating to read about the exploits of George Howard Earle III, former governor of Pennsylvania and a Roosevelt crony, who was given a commission in the Navy and assigned the mission of penetrating the German espionage network in Istanbul. In addition to starting several barroom brawls with German agents, Earle played a major part in selling the stratagem of a possible Allied Balkan invasion in Spring 1944.

During the course of the war, Nazi Germany dispatched scores of spies through neutral countries and occupied Europe to Great Britain. Breuer capably depicts the super-human effort of British Intelligence (MI-5) in capturing all of the Axis agents who made their way to the United Kingdom. Every agent was either jailed or turned into a double agent by the British. The "turned" agents were then handled by British Intelligence operatives who carefully "scripted" reports to be sent to Berlin. The British were careful to tailor the turned agent's reports to make them consistent with the agent's educational background and skills. Kernels of truth were interspersed with mounds of false information that the British wanted the Germans to have, in order to safeguard D-Day. Ultra code-breaking intercepts provided the necessary feedback on the effectiveness of the false reports.

Breuer concludes *Hoodwinking Hitler* with the Allied efforts to pin the German Army along the coast of France in support of Operation COBRA, the breakout from the beachhead. Hitler could no longer be hoodwinked by the Allied intelligence services. The Bodyguard deception was finally over, a full two months after D-Day.

While the title is slightly flip and the work mainly uses secondary sources, William B. Breuer has written an entertaining book. More importantly, *Hoodwinking Hitler* is just plain fun to read. Maybe that explains why I own five other books by Breuer, and why eight of his books have been main selections of the Military Book Club.

ARTHUR W. CONNOR, JR.
MAJ, Armor
CGSC, Ft. Leavenworth, Kan.

D-DAY 1944, edited by Theodore A. Wilson, University Press of Kansas, 1994. 420 pages, $22.50.

On D-Day, June 6, 1944, Private Lindley Higgins admitted being "dumb enough not to feel the slightest trepidation... We really

thought that we only had to step off that beach and all the Krauts would put their hands up." Of course, Higgins and the other soldiers of the 8th U.S. Infantry were greatly mistaken. The Germans were much better prepared than anyone thought, and they fought desperately to hurl the invading Allies back into the sea off the Normandy beaches to preserve Fortress Europe.

In June 1994, the world celebrated the 50th anniversary of this century's greatest battle — D-Day, the invasion of Normandy. Acclaimed as the largest amphibious assault of all time, D-Day, June 6, 1944, marked a turning point in the war against Germany. The Allies had accumulated enough strength to amass an invasion fleet of 5,000 ships, to hurl over 150,000 soldiers ashore, and to create the decisive Second Front in France.

Much has been written about this epic battle, and even Hollywood has glorified its scope and impact many times on film. Now, noted historian Theodore A. Wilson has joined with 18 other eminent writers to produce a unique and intriguing collection of historical essays on D-Day, adding to the growing collection of historical research and observation. *D-DAY 1944* is really an addendum to the 1971 publication of *D-DAY: The Normandy Invasion in Retrospect*. With updated information and renewed perspective, the essay contributors cover a wide variety of D-Day subjects and interests. Most of the contributors are historians who participated in writing the U.S. Army's official history of World War II and so bring remarkable credentials to this new volume. Prominent contributors include John S.D. Eisenhower, General Omar Bradley, and German Admiral Friedrich Ruge.

D-DAY 1944 does not offer a comprehensive, all-encompassing history of D-Day. Rather it is a selection of different aspects of D-Day that have not been examined or well-publicized before. The first five essays, called "The Muster," deal with the prelude and buildup to June 6, 1944. These essays are excellent, for they cover the often-overlooked background and years of preparation for the invasion. One essay discusses Churchill's hesitation about any attack directly on northwest France, preferring instead more indirect approaches through Norway or the Balkans. Another essay covers the tremendous obstacles the planners had to overcome, such as the lack of adequate shipping, the continual argument over dilution of resources to Italy and the Pacific, as well the uncertainty of weather for a channel crossing. The best essay of this section, by Robin Higham, provides a superb discussion of technology used on D-Day. Higham explores the advances in antisubmarine warfare, naval gunfire support, amphibious assault landing craft, radar, and the remarkable Mulberry and Gooseberry artificial harbors created by the Allies.

The eight essays which make up "The Battle" section of this book are unique in that they do not deal with the popular view of the truly hard-fought battle on the beaches and the landing zones. Instead, they deal with topics which before had been given little appreciation, but which made significant contributions to the overall battle. Two essays are concerned with analyses of naval operations. Most interesting is the essay written by German Admiral Friedrich Ruge about the weakness of German naval forces and their desperate attempts to stop the invasion fleet. Despite the courage of the crews of the few German destroyers, minelayers, torpedo boats, and submarines, however, the Allied naval forces' greatest threats came from German mines and from unpredictable channel weather.

The essay entitled "Air Campaign" reveals the fragmented and volatile command relationships that constantly snarled planning, where egotistical infighting was a continual obstacle. Through all that, however, the Allied air campaign still produced air power's greatest contribution to the war. All phases of air power were executed brilliantly, from strategic bombing to tactical missions and close air support of the front-line troops.

Other essays in "The Battle" section include discussions of special operations, anecdotes of "other men's memories," the correspondents' view of D-Day, and the involvement of the French population of Normandy. Even though the press correspondents were viewed "as an annoying and mysterious band of roving gypsies," the military knew the value of public opinion and how to best use the skills of the combat correspondents. Not everyone on D-Day was as naive as Private Higgins. Many soldiers felt that there was no way they could lose the battle. When asked by a correspondent if the Allies could be pushed back into the sea, an American general answered, "No. They'll just keep throwing stuff onto the beaches until something breaks."

The final section of four essays is titled "The Assessments" and includes an analysis of U.S. leadership during the battle, from the perspective of two U.S. Army division commanders. Most revealing is the excellent essay by Mark S. Stoler, "Dwight D. Eisenhower: Architect of Victory." Stoler traces the formation of the D-Day operational concept back to Ike's early days on the Army staff in Washington, working with General George C. Marshall. The final essay asks "was it all worth it?" Despite the price in blood and national treasure, the invasion of Normandy on D-Day, June 6, 1944, was the battle that changed the course of the war and truly laid the groundwork for the Allied victory a year later. *D-DAY 1944* is a valuable addition to the history of this terrific battle and is a most suitable companion to Cornelius Ryan's *The Longest Day* (1959) and Stephen E. Ambrose's *D-DAY* (1994).

WILLIAM D. BUSHNELL
COL, USMC, Retired
Overland Park, Kan.

Voices From Captivity: Interpreting the POW Narrative by Robert C. Doyle, University Press of Kansas, Lawrence, Kan., 1994. 295 pages, notes, bibliography, index, $35.00.

The gripping power of the story of any POW's wretched agony generates a visceral, emotional response because those experiences appeal to the most basic of human instincts — survival.

This book reviews the narratives of American POWs from a hundred years before our Revolution up to Kuwait. Dr. Doyle believes the captive's narrative is an important literary form, one that has not altered significantly in nearly 300 years, and he has undertaken a broad and objective study of POWs' stories to illustrate their commonality of structure and recurrent themes.

He examines seven phases of the POW's experience that appear consistently in every such record: precapture autobiography; capture and initial experience as a prisoner; removal from the capture site and death marches; the prison landscape; prisoners' resistance, torture, assimilation, and escapes; release and repatriation; and laments — the sense of loss, guilt purging, and condemnation of captors.

Doyle shows how American POWs from each period responded in these phases, and demonstrates how the narratives are strikingly similar. He also explains how much of the cruelty (from the POW's viewpoint) stems from the collision of conflicting beliefs and cultures. Two examples: During the Revolution, the British viewed the colonists as rebels against the crown, guilty of treason and hence criminals, undeserving of any protection as POWs. In World War II, the Japanese, raised on the soldier's code of Bushido — honor, obedience, and valor, in which surrender was considered a cowardly disgrace worthy of the harshest retribution — felt no compassion for POWs they believed to have broken that code.

In sum, this is an absorbing study of the commonality of POW narratives over the past 300 years of American history, and very useful to those who want to expand their understanding of the POW experience.

JOHN R. BYERS
COL, U.S. Army, Retired
Alexandria, Va.

News from the Armor School:

HMMWV Scout Update

The new *Light Cavalry Gunnery Manual*, FM 17-12-8, was approved on 20 June 1994 by the Chief of Armor and Cavalry, and will soon be distributed to units in the field.

The manual, produced by the Gunnery Training and Doctrine Branch, 5th Squadron, 16th Cavalry of the Armor School, provides the trainer a systematic method to train gunnery in the HMMWV scout platoon, along with training strategies for the M220 TOW, the MK19 40mm machine gun Mod 3, and the M2 cal .50 HB machine gun. It also features basic, intermediate, and advanced gunnery tables. The manual is broken into chapters on target acquisition, weapons characteristics and capabilities, and fire distribution and control.

The new MK175 pintle and MK 93 dual-purpose machine gun mount helps absorb much of the vibration when the M2 machine gun is fired from the HMMWV. The mount can also carry the MK19 40mm grenade MG. The pintle includes a traverse and elevation mechanism.

The HMMWV provides the scout a good platform on which to perform his primary mission of reconnaissance, and allows him to conduct limited security missions. Since the HMMWV scout has such a wide variety of missions, and the vehicle has a limited payload, ammunition conservation is critical. One method to ensure ammunition conservation is to keep scouts highly trained in the employment of their crew-served weapons. The other is through the development and fielding of new equipment.

Soldiers throughout the scout community are involved in the development and testing of new equipment that will enhance the scout's ability to survive on the modern battlefield.

The weapon systems for the HMMWV scouts are the MK19 40mm grenade machine gun Mod 3 and the M2 cal .50 HB machine gun. Soldiers have stated that the weapons mounts currently being used for these machine guns are too cumbersome to operate effectively on the battlefield. Soldiers at the 2d Armored Cavalry Regiment at Fort Polk, Louisiana, are acting as a testbed for some of the programs being funded by the Soldier Enhancement Program, while scouts assigned to the 194th Armored Brigade at Fort Knox, Kentucky, are testing an up-armored "scout HMMWV," as well as machine gun mounts.

Scouts are testing the MK175 Mod 0, which is a new pintle for the HMMWV, along with a machine gun mount officially known as MK93 dual-purpose mount, which gives the scout the ability to mount either of the machine guns organic to the scout platoon.

The MK93 mount has the ability to absorb much of the recoil from the cal .50 machine gun, resulting in less vibration and improved accuracy for the firing crew. It also includes a catch bag with increased size that has velcro closures to ease emptying. Scouts from Task Force 1-70 at Fort Knox fired a prototype of the MK93 mount and were pleased with its performance. They said that "When firing the cal .50, the front of the HUMMER did not vibrate as much."

The scouts also fired from the MK175 pintle. This pintle was designed and developed from input solicited from 2d ACR soldiers at Fort Lewis, Washington, and Fort Polk, Louisiana.

The MK175 pintle requires no tools. It incorporates a traversing bar that allows the soldier to use a traverse and elevation mechanism. This gives scouts the ability to engage targets quickly using range card data during periods of limited visibility.

The scouts at Fort Polk are also evaluating and testing mounts and a new thermal sight known as PAS13 for the MK19 and M2, as well as a variety of other devices that will make the scout's job easier.

Both the MK175 pintle and the MK93 dual-purpose mount will be welcomed additions for the HMMWV scout. A projected fielding date for the MK93 and the MK175 is first quarter fiscal year 1996. A date for fielding the up-armored scout HMMWV and the PAS 13 thermal sights are to be announced at a later date.