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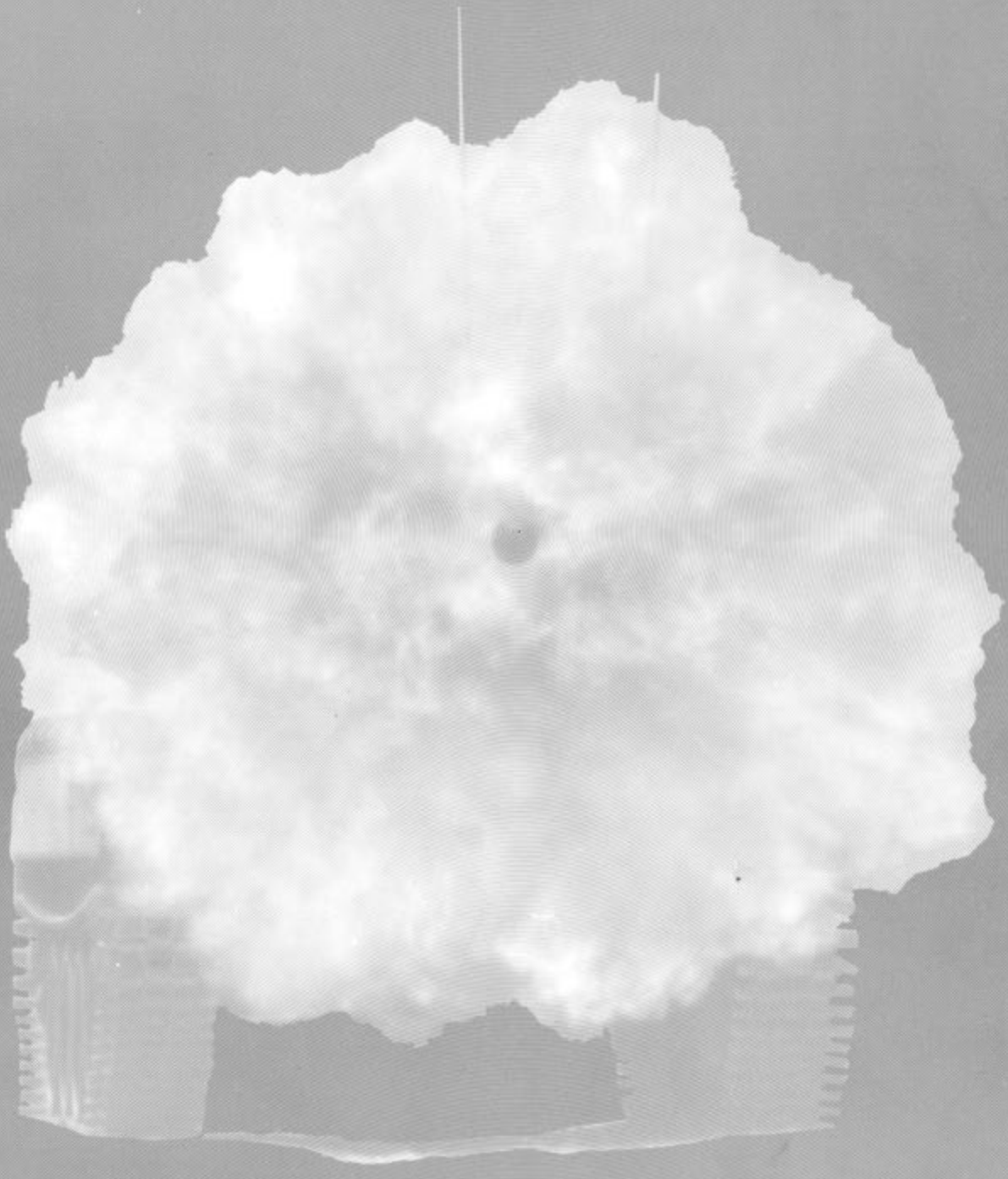

THE DEATH OF THE TANK

by Lieutenant Colonel Warren W. Lennon

ARMOR

the Magazine of Mobile Warfare

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ARTICLES

FEATURES

DEPARTMENTS

ON THE COVER . . .

Is the tank dying? Are there other means to achieve the firepower, mobility and shock effect of a tank? *ARMOR* fires at you the thought-provoking article, "The Death of the Tank," for your analysis, synthesis and evaluation.

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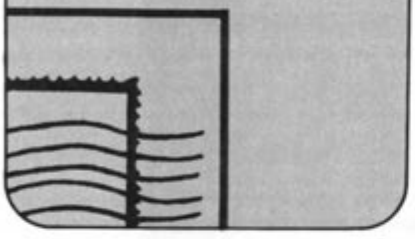
letters to the editor



Considerations for Our Main Battle Tank

Dear Sir:

Our recent main battle tank debacle was most useful. It confirmed the previously existing theory that over-sophistication is as dangerous as underdevelopment. We are fortunate that members of Congress rather than an aggressive foe put the program in check.

As we prepare for the unknown of future battlefields, we must define a role for the main battle tank as a part of the combined arms team. The development of a masterpiece which will defeat everything but inflation is a form of fantasy. Superior weapons system capabilities are essential on a future battlefield but economics dictate certain practical limitations.

The role of the main battle tank must be restricted, recognizing that other weapons systems would assume responsibility for engagement of hostile armored targets beyond a certain range. Specifically, it is proposed that the MBT be deadly to 2,000 meters. Beyond this, the missile-firing helicopter should be the primary weapons system for the attack of hostile armor.

The design of the MBT which would dominate its environment out to 2,000 meters would be considerably more simple than a "beat-the-world" tank. This practical tank must be *simple, reliable* and *economical*. It should be anticipated that many of these tanks will be lost in a major engagement as antitank defenses become more effective.

If the risk of placing our long range tank-killing hopes in the helicopter proves too hazardous, then electronic missile-firing turrets could be developed for placement on the MBT chassis. These highly advanced, sophisticated "super tanks" would be assigned to the tank battalion headquarters company. They would be organized in a six-tank platoon working directly for the battalion commander and would be deployed:

- In the Attack—to support by fire the advance of more conventional armored forces when missile-firing helicopters are not available.
- In the Defense—to cover especially dangerous avenues of approach with long range fields of fire.
- In the Delay—to cover the movement of retrograding fighting forces. These super tanks would not be assault tanks exposed to mines, rocket-propelled grenades, etc.

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US Army Tank Gunnery Techniques

Dear Sir:

The article by Lieutenant Colonel William D. Carter (November-December) concerning the 1970 Canadian Army Trophy Match is an outstanding "think piece" and has again prompted me to wonder if Armor officers have learned anything from previous matches. I have often questioned why we have not competed in this activity. I am confident it would benefit US Army tank gunnery. The invitation could be arranged.

Our current tank gunnery doctrine leaves a lot to be desired in the field of recent innovative thinking, particularly in adjustment of fire. Our doctrine still calls for BOT (Burst on Target) as the primary method of adjustment. We (tankers) are fooling ourselves if we think we can apply BOT with 105mm HEAT/TP-T ammo. The fact is that it travels too fast for BOT; dust, smoke and mud usually obscure your vision.

During two tank qualification seasons on Range 80 at Grafenwohr, Germany, as a tank battalion commander, I found that most of the misses with HEAT or TP-T were "overs" and "shorts"; i.e., ranging errors. Rarely does a gunner miss a target in deflection except when it is moving. BOT was generally poor and a first round miss seldom resulted in a second round hit.

To correct this problem and the ineffectiveness of BOT, we employed a technique similar to the German technique outlined by LTC Carter. However, we didn't worry about rights and lefts, or a mil correction—just a simple rule of thumb.

If the gunner or tank commander sensed an over, the gunner moved his crosshair to the bottom of the target, and when a short was sensed, he moved his crosshair to the top of the target. (We assumed that the tank gun was accurately zeroed.) Although you cannot normally follow the tracer or HEAT or TP-T, you could sense an over or short. Dust or mud thrown up in front of the target indicated a short and a lack of any dust or mud indicated an over. The advantage of a second tank can be readily seen. We would have done much better using the German technique, but this simple system proved effective.

Statistics kept on my tank battalion after two extensive seasons of both "on-season" and "off-season" tank gunnery also told me that hitting HEP targets at ranges over 1,200 meters is a lot of luck. Being consistent using BOT over 1,200 meters doesn't build crew confidence either. For reasons unknown, my outfit and many others I observed just couldn't get the job done with HEP ammo at ranges over 1,200 meters.

Possibly the statistics kept at the Vilseck Combined Arms School would support my observations and maybe we need to revamp out HEP gunnery techniques completely. My simple solution is to not engage point targets with HEP ammo at ranges over 1,200 meters, except when you have to for qualification or other "emergencies."

Based upon LTC Carter's article and the change of the German tank gunnery manual, we should take a long look at our current tank gunnery doctrine. A good start would be the use of *two* tanks on Range 80 and on all other tank qualification ranges. In any event, BOT doesn't get the job done and certainly doesn't build confidence in a tank crew. It was a good technique for the 90mm/76mm era but it doesn't fill the bill for the 105mm tank gun.

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Fielding the VRFWS-S

Dear Sir:

I enjoyed reading Major DeMont's article, "Attention Mechanized Infantrymen: This is your Gun!", published in the November-December issue. It is an excellent history and compilation of weapons of this type.

However, it somewhat glosses over the history and the delays in the fielding of the so-called Vehicle Rapid Fire Weapons System-Successor. In October of 1962, in answer to what was then stated as an immediate field requirement for a weapon of this type, after an extensive evaluation program was initiated. This was the so-called VRFWS-Interim Weapon, and resulted in the *HS820* being tested and finally type classified as the *M139* 20mm gun. This was then mounted on the *M114A1* and issued to troops, where, based upon my very limited conversations, it has been performing fairly satisfactorily. This same gun was also used on the Federal Republic of Germany's armored

(continued on page 84)

Armor Center Commander's Update

MG William R. Desobry

The Armor Center Commander's Update is designed to give you a current report of activities taking place at the Armor Center. In this report, I will provide information concerning the progress of actions mentioned in the November-December issue, and present new items of interest and importance that have developed in the interim.

As discussed in my previous report, the **M60A1E2 tank** was scheduled for two major program reviews in October. The first of these was an In-Process Review (IPR) conducted on 12 October which was chaired by the Vice Chief of Staff of the Army. At this review, the decision was reached to continue the program, correcting the deficiencies reported during the previous nine months of testing, and field the system as the **M60A2 tank.** Doctrinal considerations and the deployment plan were also discussed. It was determined that the *M60A2,* with its long-range missile capability, would be used primarily in the overwatch role and would complement the *M60A1* main battle tank. The second review of this program was conducted at DOD level by the Defense System Acquisition Review Council (DSARC). On 28 October, the DSARC approved the DA position.

The Armor Center has recommended to CONARC the two organizations it considers best for deploying the *M60A2* to USAREUR combat units. These recommendations were the result of a detailed study of various *M60A2* organizational mixes. This study has also pointed out that the unique capabilities of the *M60A2* may demand new organization and employment concepts. An Intensified Confirmatory Troop Test will be conducted to validate fixes for the reported deficiencies, confirm the proposed doctrinal concepts, and evaluate various organizations developed for the *M60A2.* I will continue to keep you abreast of activities concerning this very important program.

The **product improvement program for the M60A1 series tank fleet** is progressing on schedule. The add-on stabilization system has successfully completed troop testing at Fort Hood, Texas, and proved acceptable for introduction into the new tank production. On 2 November, an informal IPR of the system and program status was conducted at the Project Manager's *M60* Tanks Office in Warren, Michigan. The IPR attendees voted to initiate production of the add-on stabilizer and to recommend to DA that a production contract be awarded for the system. The production contract was awarded late last year, with the initial delivery of *M60A1* tanks with stabilization systems commencing in August 1972.

The top-loading air cleaners are currently being applied to production tanks and it is anticipated that the MWO kits for the air cleaners will be ready for issue to the field during this calendar year. A new track, the *T142,* is expected to be available in March or April of this year. It is anticipated that this track will double the life achieved with the current track. Since there are several other product improvements scheduled for this tank fleet, I will continue to update our progress in subsequent issues.

The approved configuration of the **Armored Reconnaissance Scout Vehicle** (ARSV) material requirement was released for proposals to industry on 15 October. Rather than specify the type of vehicle, i.e., track or wheel, general performance characteristics are provided to industry and an evaluation of the prototype proposals will be part of the source selection process to determine two or more contractors to proceed into the next phase of expanded contract definition (ECD).

The Armor School has just completed **an analysis and evaluation of the various types of air cavalry squadrons,** both separate and divisional, to determine the adequacy of personnel and equipment to execute the mission requirements as stated in the TOEs. As a result, it was determined that the bulk of the air cavalry squadron TOEs do not provide sufficient personnel for command and control of assets during day and night operations over extended periods of time. The School has proposed a standardized TOE for these units. Major proposed changes provide for: increased personnel for operations, flight operations and maintenance; the assignment of an armored cavalry troop to all air cavalry squadrons; and dividing the aero-rifle platoon and a separate lift section.

I have recently revitalized the program of providing on-the-spot assistance to CONUS field units in the form of **Armor School Contact Teams.** Instructor personnel from the departments within the School will be available upon request from units to provide you with a team tailored to suit your unit's individual requirements. Contact Teams will assist in problem areas concerning equipment and training. Requests for assistance should be made to the Director, Office of Doctrine Development, Literature and Plans, US Army

Armor School, Fort Knox, Kentucky 40121, or phone AUTOVON 464-2453/4325. Merely specify the areas in which assistance is required. The Contact Team project officer will coordinate all details with you personally prior to the visit. Contact Teams are available to assist you—take advantage of them.

CG, CONARC was briefed on the Armor School recommendations to **improve Armor maintenance MOS structures.** One of the recommendations was the creation of three separate turret mechanic MOSs which would require separate training programs. CG, CONARC directed that USAARMS develop and implement two separate turret training programs for the *M60* and *M551*, and plan for the *M60A2* course. The "pure" *M551* course was initiated on 4 January. The CONARC staff has been tasked to examine the best means of identifying school-trained, systems-oriented turret mechanics.

Other USAARMS recommendations included: revision of current MOS 63E to provide a separate MOS for uniquely trained and experienced Armor tracked vehicle mechanics and motor sergeants; the revision of MOS 45K to provide an MOS for organizational turret maintenance personnel; and the authorization to assign a turret maintenance NCO grade E-6 at company/troop and grade E-7 at battalion/squadron levels. These recommendations are currently being staffed at CONARC.

In the field of air cavalry, the concept of an **Air Cavalry Leader's Course** was approved by the CG, CONARC, on 5 November. We are now fleshing out the program of instruction and should have the course completed by mid-January. The primary aim of this course is to train junior leaders in the proper tactics and techniques of employment of air cavalry units so that they may, in turn, effectively conduct unit training programs. The course encompasses all aspects of air cavalry, ranging from the rifle, scout and weapons platoons of the reconnaissance-oriented cavalry, through our newest addition, the air cavalry attack organizations. The Air Cavalry Leader's Course will replace the existing Officer/Warrant Officer Air Cavalry Qualification Course. The Aeroscout Observer Course will, however, continue to be a part of the Air Cavalry Program taught at Fort Knox.

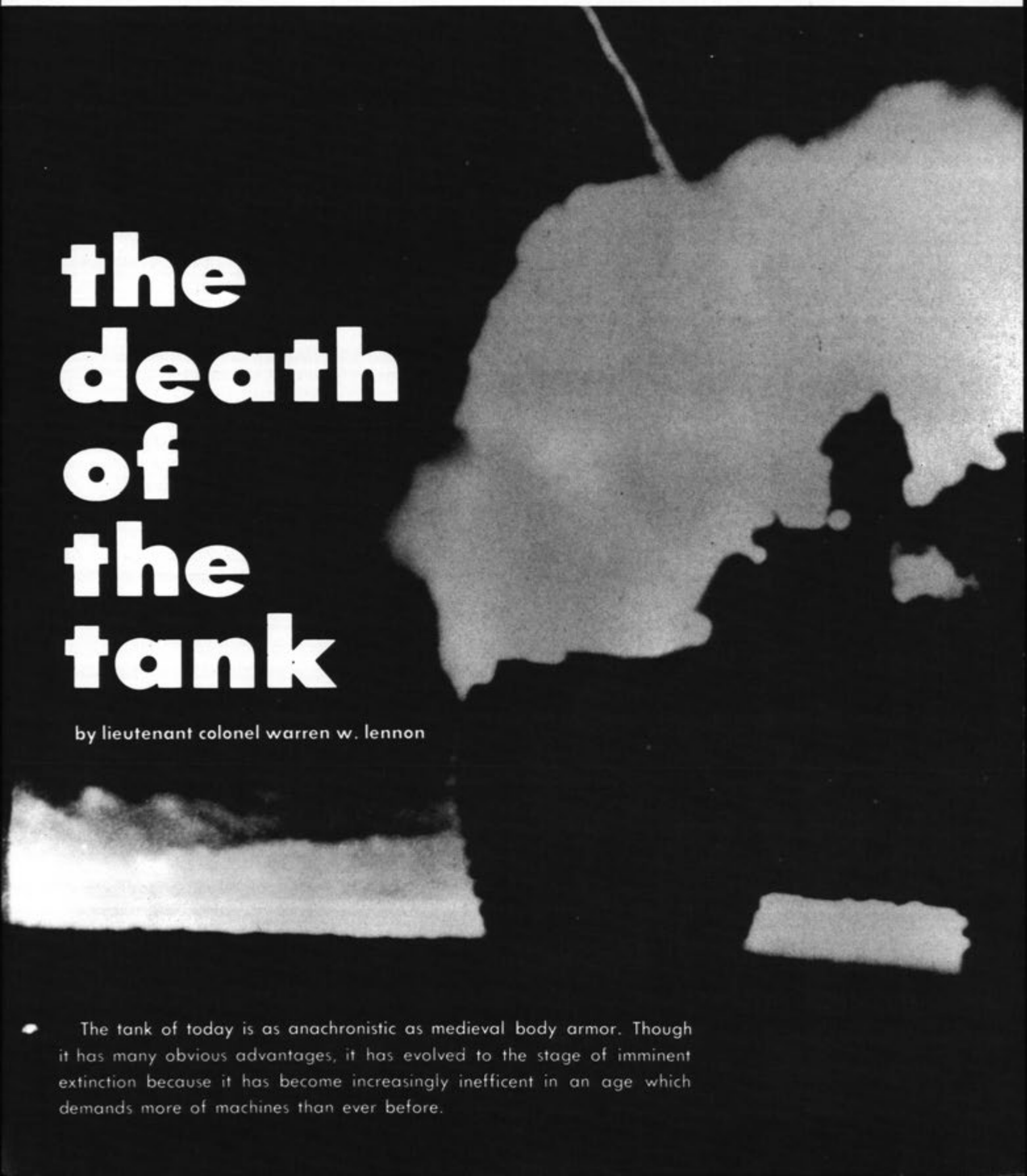
The latest of our **NCO Basic Course** under the Noncommissioned Officer Education System commenced 2 November. In the past, the response to these courses has been small and one reason for this was the lack of a tangible reward for attendees. Whereas in the past only 14 promotion points were awarded for successful completion, this has recently been increased to 42 promotion points.

There are currently scheduled two Armor Crewman NCO Basic Courses, one on 11 January and the other for 25 April, and an Armor Reconnaissance Specialist NCO Basic Course for 14 March. These courses were developed to provide MOS-related education for NCOs and provide a working knowledge of the duties in an Armor unit. Additionally, these courses parallel the Commissioned Officer Courses taught at the Armor School. For that outstanding NCO that you would like to help get ahead, consider sending him to one of the Armor Noncommissioned Officer Education Courses. Remember, it is worth 42 promotion points to him.

US forces engaged in military operations in Southeast Asia have paid a high price in men and materiel to learn the many lessons cited in **Senior Officer Debriefing Reports (SODR) and Operational Reports-Lessons Learned (ORLL).** To insure that these lessons have not been learned in vain, a comprehensive and detailed analysis is being conducted of these reports to develop a valid basis for improved doctrine, organization, materiel and training for use by Armor units and personnel. Particular attention is being given to the integration of observations and recommendations cited in these reports into the programs of instruction. This subject has also been designated as an AOAC student research project. The Armor-oriented observations and recommendations identified in these reports will also be compiled in a single booklet or pamphlet for easy reference.

Four **XR311s** have arrived at Fort Knox for limited testing by USACDC Armor Agency and the USA Armor and Engineer Board. The *XR311* is a rear-engine, gasoline-powered, four-wheel constant drive military chassis mounting a crew of three. The armored "dune buggy" was developed by FMC from experience gained in monitoring off-road and cross-country sporting events. Three vehicles are configured for a recon role mounting a .50-caliber machine gun, and one for an antiarmor role mounting the *TOW*. This new vehicle concept will be tested for performance, maintainability and tactical suitability for use by Armor.

We are interested in major problems being experienced by Armor units around the world. If you are a commander of an Armor unit with a significant problem that you feel the Home of Armor is not aware of, please feel free to write and explain the problem in as much detail as possible. I assure you that your problem will receive my attention and that of the Armor Center Team. In addition, commanders with any materiel problems related to equipment not performing the way it is intended to perform should submit an **Equipment Improvement Report** (EIR), Form 2407, in accordance with TM 38-750, pages 3-26. The importance of these EIRs cannot be over emphasized. The commodity commands thoroughly review each report for necessary action. I would also like to ask commanders to make an extra copy of their EIR and send it to me, attention the Secretary of Armor, so the Armor Center Team can keep informed.



the death of the tank

by lieutenant colonel warren w. lennon

The tank of today is as anachronistic as medieval body armor. Though it has many obvious advantages, it has evolved to the stage of imminent extinction because it has become increasingly inefficent in an age which demands more of machines than ever before.

The title alone of this article will no doubt provoke indignation in some quarters; but the passing of the horse-drawn and horse-borne era did not occur in quiescent silence either.

The imminent demise of the tank does not imply any degradation in strength or status of armored units, but rather identifies a need to adapt our thinking to the achievements of technology. Just as the introduction of the tank to modern warfare had great impact on tactical philosophy, so will its passing. Perhaps it is more accurate to say that changes in tactics have led to the technological advances which have killed the concept of the tank as we know it.

The history of tank development is characterized by continuing conflict between armor and armament and between weight and speed. Ever since the tank was first introduced to warfare, designers have been torn between the need for a light fast tank, and a heavy invulnerable machine capable of resisting and destroying enemy tanks. Many nations have resolved the conflict by employing tanks of different sizes. Others have attempted to satisfy all needs in the one vehicle by achieving compromise on the various requirements. The disadvantages of each approach have often been dramatically demonstrated in military history.

Since World War II, a wide range of tanks have been produced, indicating that the conflicts still exist. As main battle tanks have been given better armor and better guns, so have they become larger and heavier. The evolution of large tank-killing tanks, such as the British *Conqueror,* has generally been abandoned in recent years since too much mobility was sacrificed to make them invulnerable.

Recent scientific developments and exploitation of other military equipments give cause for some rethinking on the role and characteristics of the tank. The major characteristics of tanks and tank units in the past have been:

- Firepower
- Mobility
- Protection

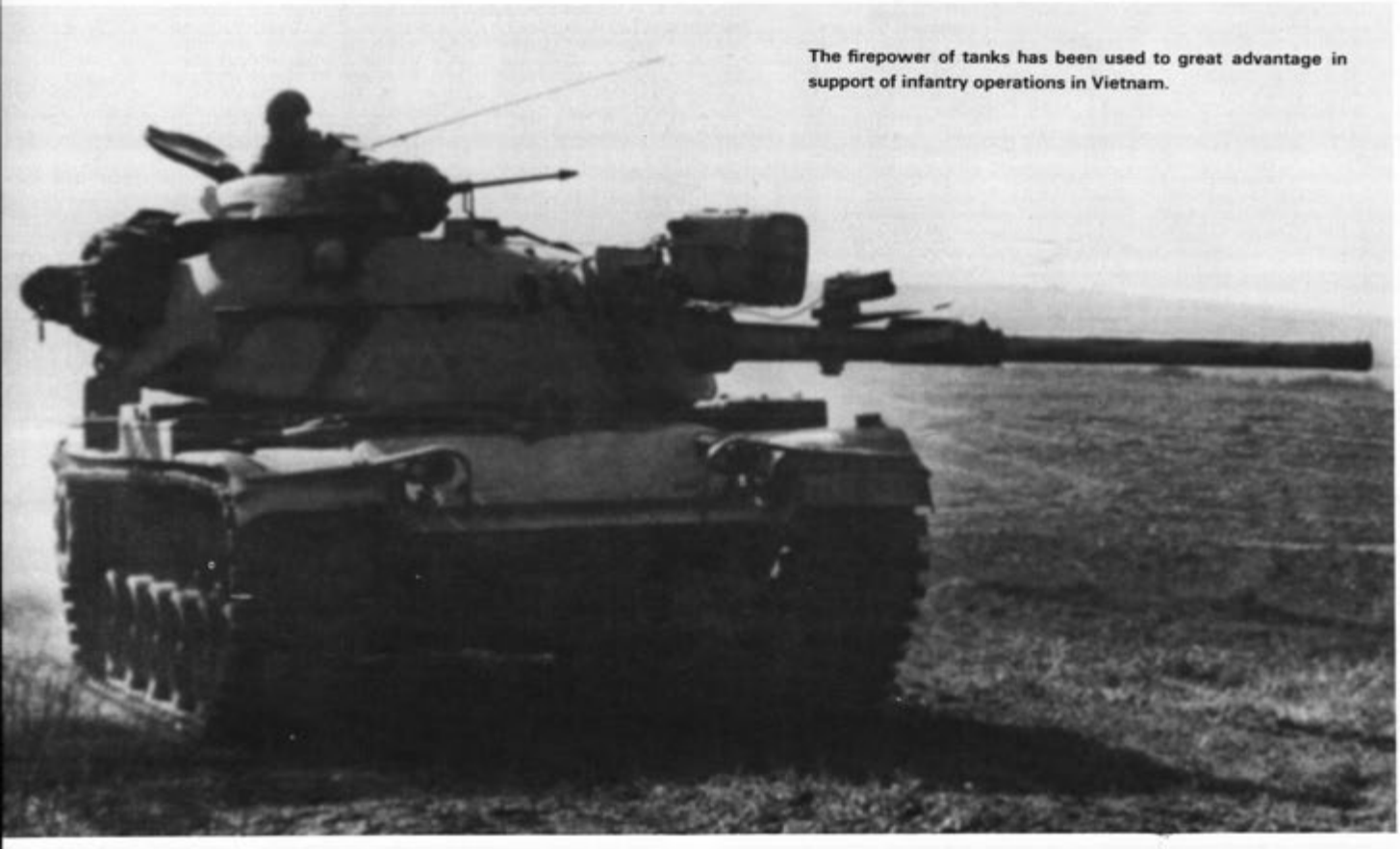
Other characteristics are often quoted, but they are incidental rather than essential to the nature of the tank. Different nations assign different priorities to these characteristics, and it is usually necessary

to trade off one against another in design. Alternative methods of achieving these main characteristics bear consideration. The relevant time frame is the late 1980s and thereafter; that is, after completion of development of the present drawing board generation of weapons.

FIREPOWER

The value of direct-fire, hard-hitting main armament is evident. Firepower is the *raison d'être* for the tank. The firepower of American and Australian tanks has been used to great advantage in support of infantry operations in Vietnam—in a type of war where many pundits said tanks would be useless. Despite the fact that the enemy has few armored vehicles and virtually no soft-skinned vehicles, and despite the difficulty of coming to grips with enemy concentrations, the weapons of the tank have been useful. The main guns can deal effectively with enemy bunkers, and their accuracy allows a commander to quickly and effectively neutralize any suspected enemy position which he can pinpoint and indicate to the tanks. Even the heavy machine guns which are carried on most tanks provide the infantryman with a source of sustained heavy caliber firepower which is not otherwise readily available to him.

Probably one of the greatest advantages of tanks over both artillery and air support in a Vietnam-type war, is that the tanks are usually physically close to the mobile-supported unit and consequently target indication is facilitated and communications simplified. In addition, with tanks in support of infantry, response time of their fire support may be as short or shorter than that of the infantry sub-units themselves. In an atmosphere of enemy indirect or small arms fire, the tank is obviously capable of quicker effective reaction than the infantry. Against an enemy with light armored tanks or personnel carriers, or even soft-skinned vehicles, the main tank armament finds many worthwhile targets which



The firepower of tanks has been used to great advantage in support of infantry operations in Vietnam.

cannot always be dealt with quickly by other means.

On the other hand, while the Vietnam war has illustrated some of the advantages of tanks in a situation where there was some doubt about their value, it has also demonstrated the effectiveness of other forms of direct firepower. The enemy has shown how effectively various sized rockets and recoilless rifles can be used in both direct and indirect modes. Most of these weapons are man-carried and their accuracy has been proven in combat and in tests of captured weapons. They have been used against vehicles, personnel carriers, strongposts and even tanks with devastating results. They appear to offer some of the advantages of the tank main gun with few of the disadvantages. Allied use and exploitation of similar weapons has been inhibited by the lack of targets and the ready availability of other sources of firepower.

While a commander can obtain heavy suppressive or destructive artillery or air fire support, or call on tank support for direct-fire missions, the absence of other direct-fire weapons is not critical. The development of the *M79* and *M203* grenade launchers was inspired by the need to fill the gap created by the absence of suitable man-portable, direct-fire weapons. Development of a satisfactory infantry antitank or antibunker weapon was not pursued because tanks and other supporting fires were readily available.

The *Dragon* is a surface attack guided missile system light enough to be carried and deployed by one man.

The *TOW* missile system is a tube-launched, optically-tracked, wire-guided system capable of penetrating all known tanks at greater than 3,000 meters.

Recently, a lot of work has been devoted to the development of antitank missiles, both man-portable and light vehicle mounted. In view of the likely enemy superiority of numbers in the Northwest Europe context, and with a knowledge of his likely tactics, the development of a strong antitank defense assumes great importance. Indeed many British protagonists of the mobile defense in-depth, place great store in the value of "stay-behind" tank-killing teams using light but effective antitank weapons. Though guided missiles have not yet measured up to the hopes held out for them, the current generation offers attractions which challenge the conventional tank gun for cost and efficiency.

MILAN, being developed by the Germans and French, is a man-portable semiautomatic missile with a range to 2,000 meters which might satisfy the infantryman's need. The *Dragon*, a surface attack guided missile system being developed in America, is an antitank weapon light enough to be carried and deployed by one man, yet potent enough to destroy armored vehicles and battlefield fortications. The American *TOW* and Germand/French *HOT*, as well as the British *Swingfire*, offer effective ranges greater than most tank main armaments, and are capable of penetrating all known tanks at greater than 3,000 meters.

While the missiles are expensive (in the order of 20 times the price of an antitank gun projectile) and they have other inherent disadvantages, they are light, have no recoil or back blast, are more accurate at longer ranges and do not require a large launching vehicle as does a conventional gun. The main opera-

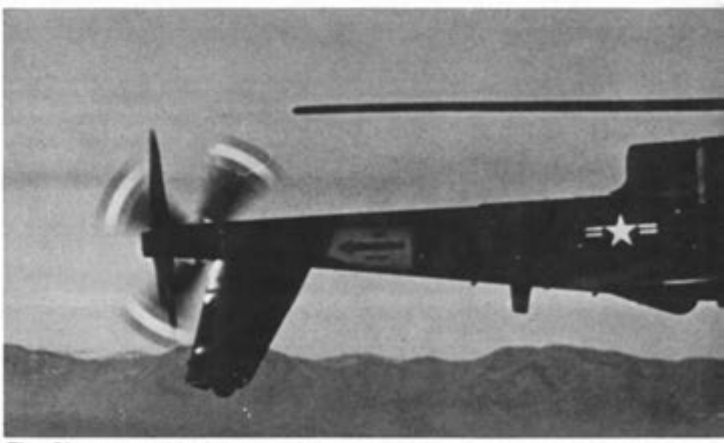
The Swedish *IKV91*, which weighs only 15 tons and possesses low ground pressure giving it good traction in wet going, carries a 90mm Bofors low-pressure gun.

tional disadvantage is the long time of flight and the need for the operator to be able to either direct the missile (as in *Swingfire*) or maintain the cross wires on the target throughout its flight. The next generation of missiles, at present prohibitively expensive, will probably offer the "fire and forget" fully automatic capability.

The development of these weapons and the production of gyroscopically stabilized sight systems and laser range finders is rapidly leading to a situation where missiles may be fired from many types of lightweight platforms. A laser defensive system is being considered for use on the American *B1* supersonic bomber, and in the foreseeable future, an offensive laser or similar ray might be used successfully against vehicles. Developments such as these are rapidly leading to the time when accurate, reliable, quickly deployed and effective weapon systems will be carried and operated on smaller and faster vehicles than the tank as it is known today.

The *Huey Cobra* "up-gun" will carry eight *TOW* missiles and should be much more effective against armor than earlier helicopter-borne missiles. The introduction of the fire and forget missile would remove the main objection to helicopter missile platforms. Even without antitank weapons, helecopters have demonstrated their value in Vietnam as a source of close fire support. The gunship has evolved from the armed utility helicopter, through the button-on stage of armament, to the purpose-designed *Huey Cobra* and *Cheyenne*. Notwithstanding limitations on endurance and weather capabilities, helicopter fire support will often be used in the future rather than tanks.

A further development in the evolution of firepower is the employment of the low-pressure main gun. The new Swedish *IKV91* light tank (weighing 15 tons) carries a 90mm Bofors low-pressure gun which fires fin-stabilized projectiles. The low-pressure design minimizes the need for a large vehicle and there is less visual weapon signature because flash and obscuration are reduced. This weapon may offer a satisfactory compromise between the needs for a lightweight vehicle and for an effective gun—particularly if used in conjunction with missiles. The *M551 Sheridan* main gun/launcher concept has not won widespread popularity with other countries, though the French have produced



The *Cheyenne*, with the speed (over 250mph), ease and maneuverability of a fixed-wing aircraft, is used to escort troop-carrying helicopters and provide direct fire support for ground combat units. Operated by a two-

a 142mm gun/launcher for their *ACRA* missile. Later generations of this type of weapon might be ideal for a lightweight platform.

MOBILITY

Tanks achieve their mobility by virtue of low ground pressure, the resistance of tracks to damage by small arms fire, adequate horsepower and suitable suspension. Restrictions on mobility are imposed by:

- Wet and marshy ground
- Damage to running gear and mechanical failure
- Ravines, steps and excessively steep gradients
- Excessively rocky terrain
- Densely timbered country
- Artificial obstacles

The tank, as we know it, performs better against the first two types of obstacles than against the others—which generally render the terrain not good tank country. While the track-laying tank can be designed to have low ground pressures to improve its ability in wet going, better mobility is theoretically practicable with a smaller vehicle (except in an attempt to "scrub-bash" through undergrowth). The Swedish *IKV91* weighs 15 tons and achieves 5.7 pounds per square inch track pressure, which is even lower than the *M551 Sheridan.* The British armored reconnaissance vehicle *Scorpion,* with track pressure of only 5.0 pounds per square inch, has shown remarkable wet ground capability.

While tracks have better resistance to small arms and shrapnel than do wheels, they are a "go or no-go" traction system. If a track is severed, the tank does not go. Apart from operational hazards, they are susceptible to damage in rocky or steep terrain. Furthermore, they increase the all-up weight and size of the tank, making it less capable of moving through timbered country and on artificial transport media—particularly bridges and roads.

Although ground pressures are kept low, most main battle tanks have a bridge classification far higher than other military vehicles and this often restricts their movement on highways. Road movement of tanks can badly damage road surfaces. Extensive movement of tanks in peace or war usually requires some sort of engineer support. In some countries, railways cannot accept the weight and dimensions of tanks.

Recent work with new wheeled vehicles has indicated that far greater mobility might be practicable than was apparent a few years ago. Two of the more outstanding examples of such machines are the *XM52* Caterpillar *Goer* and *XM808* Lockheed *Twister.*

The *Huey Cobra* has demonstrated its value in Vietnam as a source of close fire support.

man crew of pilot and co-pilot/gunner, the gunship's features include a laser rangefinder, a central fire control computer, a 12-power periscope sight at the gunner's station and a helmet sighting system.

The *Goer* served in Vietnam in various cargo carrying configurations, and demonstrates cross-country performance comparable to that of *M113* personnel carriers in swampy going. The vehicle has an articulated body with "wagon steering" and four large, low-pressure tires. There is no suspension system but the four-wheel drive will allow 30mph movement carrying an 8-ton load. The vehicles were originally designed as logistic support vehicles for armored and mechanized units, and as such, they were required to have comparable mobility.

The *Goer* evolved from wheeled earthmoving equipment and speed was not the main aim. Though

The highly mobile *Twister* has the capability of carrying a variety of weaponry.

large and not armor-protected at all in its present configurations, the *Goer* has such a respectable load carrying capacity that it could be lightly armored with a relatively small restriction in its carrying capacity. In the foreseeable future, the vehicle could conceivably be fitted with heavy machine guns, rocket or missile launchers, or even a gun to give it firepower as effective as the armament on current main battle tanks.

The *Twister* offers even more potential for high-speed mobility over rough terrain. This vehicle has a low profile fully articulated double body, with eight driving wheels and independent suspension, and a separate engine in each part of the body. The manufacturers claim a top speed of 65mph, a twenty-foot turning radius, and ability to traverse extremely rugged broken ground without upsetting the passengers. It has a 400 mile range, is air transportable, and can be adapted to a wide range of configurations. Although the vehicle is not yet in military service, the US Army has tested prototypes and Lockheed has evaluated one with amphibious capability.

Ground effect machines, or hovercraft, have made a significant impact on vehicle mobility, particularly in extremely soft going. Their limitations are such that they will probably have little influence on the replacement for the tank. A combination of wheels for control and air-cushion for load distribution has been found to be a satisfactory solution to the movement of heavy loads over soft ground. However, the combat vehicle of the future will probably rely on light weight and maneuverability for its mobility and speed, and will not require air-cushion for normal cross-country travel.

One of the most significant technological advances which will affect the design of future cross-country vehicles is the invention of cellular rubber tires. These are non-inflatable, of coarse grain closed-cell synthetic rubber, with inert gas filling the cells. Experiments have indicated that tires made of this material perform satisfactorily, though they are rather more rigid than conventional ones. At high speeds there have been some problems with overheating, but this difficulty is probably only a temporary one. Puncture tests have shown that

they are virtually unaffected by complete penetration by nails, spikes or bullets. The small number of cells which are ruptured by the projectile do not affect the overall resilience or stability of the tire. The latest development, a "permafoam" filling, has been used successfully at speeds of 30mph.

There is every reason to expect that it will not be long before a tire will be available to match the performance characteristics of wheeled combat vehicles, thus swinging the pendulum from tracks towards wheels. The West German Army plans to introduce an eight-wheeled APC/reconnaissance vehicle into service in 1973. The British *Saladin, Saracen* and *Stalwart* have shown good mobility in many types of going, and although equipped with only six wheels, they can still motor with a wheel blown off.

PROTECTION

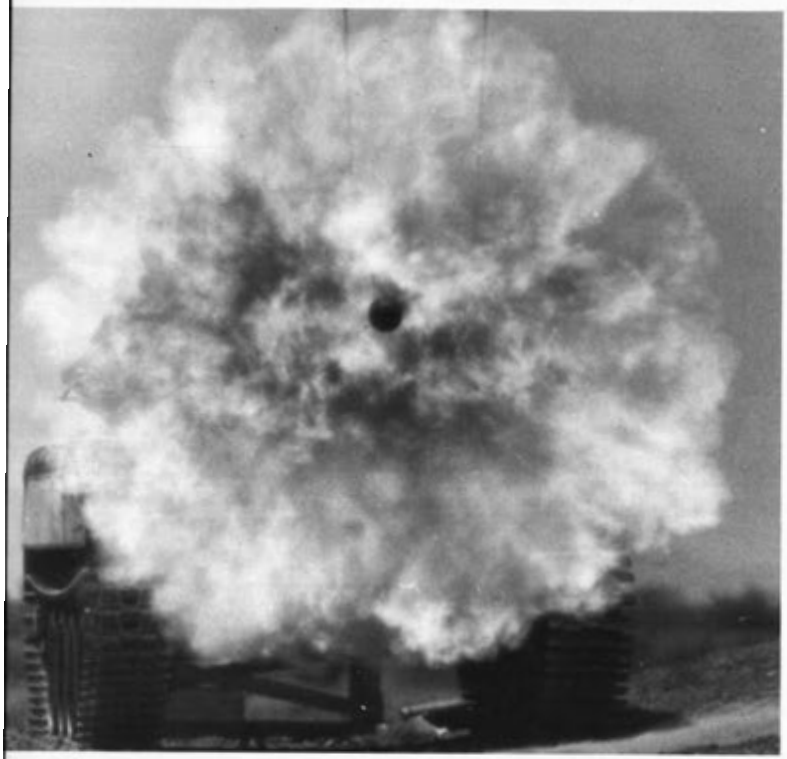
The value of the protection afforded by modern tanks has been subject to question for some time. Operations in Vietnam have shown that even without the presence of enemy tanks and aircraft, allied tanks can be destroyed and disabled. Even if a tank is only immobilized and not destroyed, it loses most of its advantage.

On a modern tank, the areas which are probably most vulnerable to disabling damage are the running gear, the main armament and the commander himself. The first two represent mobility and firepower. If the commander is forced to fight closed down, the tank loses much of its effectiveness and becomes even more vulnerable to some types of weapons. Command then relies heavily on the tank's optical system, which is another chink in the tank's armor. The rather lavish protection of the crew is to little avail if the tank has lost its mobility, firepower or freedom of maneuver.

Protection can be achieved by means other than the brute deflection of incoming projectiles. It can be gained by evasion, by agility, by concealment or by deception. The larger and slower the tank, the more difficult evasion will be. With the heavy research emphasis that several nations are devoting to surveillance equipment, the tank becomes more and more difficult to hide or disguise. Depending on the sensors used, the tank may be revealed and identified by its sheer size, its noise, dust and vibration, its main gun visual and audio signatures and its significant heat source. Deception is awkward and expensive with large machines—even dummy tanks being bulky and costly.

These factors have led to recent consideration of lightweight tanks with high speed and maneuverability, where physical shielding has been sacrificed to a certain extent for increased evasive capability. The *Sheridan* tank for instance weighs only 20 tons

The tank becomes more and more difficult to hide or disguise.



The *Shillelagh* missile is fired from the same 152mm gun tube mounted in the turret of the *Sheridan* that fires conventional ammunition.

and has a maximum speed of 40mph. One of the fastest though not the newest tanks in the world today is the French *AMX13* which travels at 43 mph. The new Swedish *IKV91* matches this and the British *Scorpion* exceeds it.

Considerable advances have been made in the development of quickly deployed antitank mines, some being of the "high-kill" type. The new West German mines *Pandora, Medusa* and *Dragon Seed* are complementary airborne rockets or artillery-carried, multiple-mine systems aimed at stopping vehicles. *Pandora* is a selective mine which attacks tracks but not wheels. In any case, wheeled vehicles may have more chance of retaining mobility after a mine attack than do tracks. The English *Bar Mine* is effective and can be quickly laid. In any future conflict involving tanks, tactical antitank minefields will be a decisive factor in the outcome.

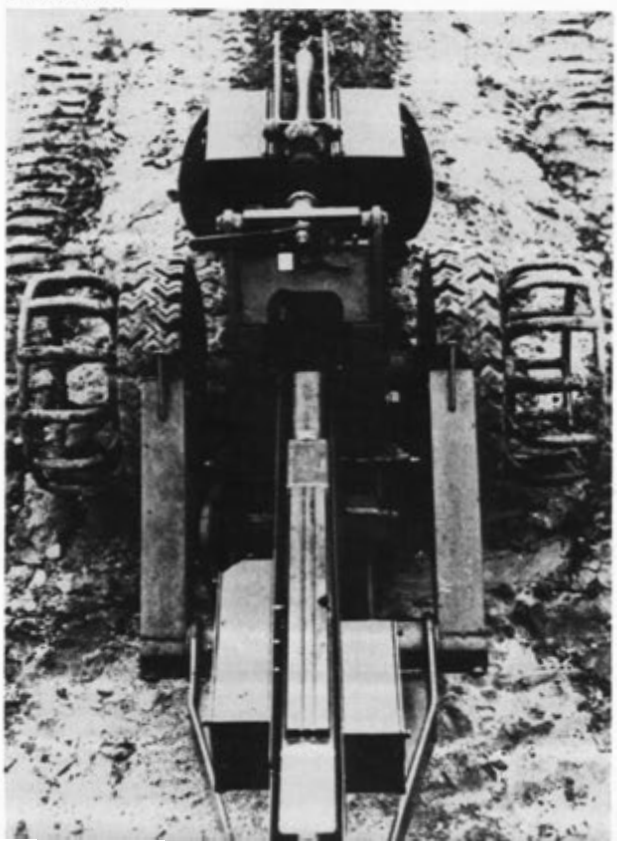
With the current array of antitank guns, missiles and mines in national inventories, protection of fighting vehicles by the use of armor is limited—despite improvements in this field with ceramic and dual hardness steel plates. Current research will probably result in improved lightweight armor to counter shrapnel, small arms fire and small caliber armor-piercing bullets. In the more distant future, there could be the introduction of electromagnetic protective shields or a system of tactical anti-ballistic missiles or lasers for land vehicles. CBR protection can be provided already by many materials other than armor plate without the weight penalties which exist at present. Armored protection against small caliber projectiles is already so light that it can be carried by small fast vehicles and is even envisaged for the Sikorsky Aerial Armored Reconnaissance Vehicle helicopter.

OTHER FACTORS

It has long been a claim of tankers and others that the psychological value of the tank is important. This is probably still true against an enemy with no substantial antitank weapons. But trained tank hunters, whether on foot, in aircraft or in light and fast armored vehicles, regard tanks as targets rather than ogres and can achieve psychological victory if their tactics and weapons are good enough.

The shock value of tanks has diminished extensively since the first day they were used, recognizing

The English *Bar Mine* can be quickly and effectively deployed against tanks.



of course, that tanks were used effectively by both sides in World War II as a shock weapon. Current Russian tactics are based on maintenance of momentum and the shock effect of the fast concentrated armor breakthrough. Shock effect is a two-edged weapon. The sight of an advancing enemy tank to an infantry tank hunter is probably not as shocking as the sight of a burning tank to the commander of the next one in line.

The helicopter has intruded into consideration of all three of the main characteristics of the tank. While it is unlikely to replace the tank, it does have capabilities which would appear to make the tank less indespensible. At present, it can probably be regarded as a valuable complementary weapon to the tank and is aptly described as an Advanced Aerial Fire Support System.

The logistics problems of modern warfare seem to increase daily and almost exponentially in some areas. Weapon systems of the future will be designed with minimum logistic backup requirements as one of the major parameters. In anti-guerrilla warfare, logistic lines can be vulnerable, and in general war, they will probably be very extended for one side or the other. In either situation, large equipments in small numbers with heavy maintenance requirements will be a problem. In peacetime or in cold war, authorization of expenditure on high capital weapon systems is difficult to obtain and cost benefits must be clearly established. The United States House of Representatives Armed Services Committee demonstrated this attitude in June 1971 in denying the Army's request for $59 million to procure *XM803*. At this time, though authorizing further research on *XM803*, they commented on the fact that West Germany and Russia "are placing more and more emphasis on light, hard-hitting antitank vehicles and weapons." They also noted the cessation of production of the Soviet Union's heavy tank.

In the January-February 1971 issue of *ARMOR*, Lieutenant General George I. Forsythe commented "the tank is here to stay and . . . in the 1970s is going to be very much like the tank we have known in the past." There is much evidence to suggest that the "tank" of the 1980s and later will retain few features of tanks of this decade.

WHAT OF THE FUTURE?

If the tank is indeed dead or dying, what remains apart from the cavalry spirit? There will continue to be a need for vehicles which can carry heavy firepower wherever it may be needed. There will still be a need for highly mobile weapon systems to move in close ground support of vehicle-transported infantry. There will still be a requirement for a fast cross-country vehicle to strike at the enemy from the flank where he least expects it; to pursue the withdrawing force; and to provide concentrated but mobile firepower in the counterattack. Even in counterrevolutionary and limited war, these needs will continue to exist.

The combat vehicle of the future will not be stereotyped. It will probably be essentially an articulated vehicle with probably multiple driving wheels fitted with cellular/solid tires, capable of high-speed performance in most types of terrain. It could have multi-fuel engines with an operating

As demonstrated by the *XM803*, authorization of expenditure on high capital weapon systems is difficult to obtain.

range in the order of 500 miles rather than the typical current tank range of 200 miles. The basic machine will have a low profile, and will be adaptable for use as troop carrier, cargo carrier, recovery vehicle, mortar, howitzer or field gun platform, antiaircraft weapon carrier or as a direct-fire weapon carrier. In this latter role, the vehicle may be fitted with rockets or guided missiles, or low-pressure conventional gun, heavy machine guns, grenade launchers and other novelties.

Combat vehicles will be armored against small arms fire and shrapnel, probably using lightweight alloy, plastic or ceramic plates, or flexible sheets. At some time in the future, these vehicles may be equipped with invisible electronic or electromagnetic antimissile shields. Some may be equipped with electronic remote explosive initiators which will destroy enemy mines, incoming missiles or rockets at a safe distance. Science may produce a practical, defensive, antiballistic missile or laser to deal with offensive incoming enemy ordnance.

These combat vehicles will demonstrate many of the traditional characteristics of cavalry units—even more than tanks ever did.

The tank of today is as anachronistic as medieval body armor. Though it has many obvious advantages, it has evolved to the stage of imminent extinction because it has become increasingly inefficient in an age which demands more of machines than ever before. It has become the Juggernaut of modern military technology, demanding high capital outlay and enormous logistical support, in return for fire support not much more effective than that of the lone enemy guerrilla who destroys the tank with a well-placed rocket.

This article is an update of "The Tank is Dead" which appeared in the March 1970 issue of the Australian Army Journal. THE EDITOR

LIEUTENANT COLONEL WARREN W. LENNON graduated from the Royal Military College, Duntroon, Australia, into the Royal Australian Engineers. In 1964, he served as an exchange officer with the 65th Engineer Battalion, 25th Infantry Division in Hawaii. He commanded a field squadron and a construction squadron with the Australian Force in Vietnam during 1967. Colonel Lennon is currently assigned to Australian Army Headquarters in Canberra.

Are weapon systems becoming too sophisticated, thus adversely affecting reliability, capability and maintainability? The M60A2 *will be introducing a new complex electronic turret to the armor field.*

The Big Trade-offs

by Lieutenant Colonel Bart M. Filaseta

One of the serious issues facing men of armor today is the problem of how to deal with the modern, complex weapon systems now being developed. Such a variety of new systems is under development that few people can properly keep abreast of the rapidly changing forms of equipment which will come into our inventory during this decade.

The type classification of the *General Sheridan, M551,* which is now out of production, was the beginning of a new era in armor—the era of sophistication. The birth of this era went pretty much unnoticed, and some people still fail to realize it is upon us. As milestone dates roll by and the *M60A1E2* tank is fielded (to be designated the *M60A2*), the full impact of this new era will begin to strike commanders at all levels. Many aspects of the *M551,* including the combustible cartridge case, the *Shillelagh* guidance and control system, the maintainability of the turret, and the complex conduct of fire trainer presented unique and challenging problems to all commanders who received this vehicle. When the *M60A1E2* is fielded, similar problems will be encountered and probably to a greater degree because of the significantly greater complexity of this tank's turret.

Armor must continue to move forward and take advantage of the technological advances made both by industry and by the Army's in-house research and development programs, which can provide better combat capabilities. However, some basic questions need to be answered about the degree of complexity

armor requires to properly fulfill its role on the battlefield. For example, when does the equipment become too sophisticated for the men who must fight with it? Have we reached the point where we could maintain ourselves off the battlefield because of over sophistication? In addition, the basic trade-offs between sophistication and reliability must be examined carefully against the requirements of our systems. Is a gain in capability being overshadowed by a loss in reliability and maintainability? Is the risk we may have to take in reliability and maintainability fully warranted by the greater capability we hope to achieve?

To begin with, one may ask what is the status of sophistication in armor equipment? The big four of armor, the scout helicopter, the attack helicopter, the armored reconnaissance scout vehicle, and the tank are all becoming more sophisticated.

Let us look at our new tank systems since here is where the most concern seems to stem from. If anyone looked upon the *M551* as complex, he may be alarmed at the *M60A1E2* system. The electronic turret of this tank is a significant departure from any one previously produced. Through the years we have progressed in our tank development in small, careful steps. We have increased the size of our main gun, refined the gun-turret controls, and improved the rangefinder and other fire control instruments. All changes resulted in an increase in fighting capability without any significant loss in reliability.

On the maintainability side of the picture, the burden for the soldier-mechanic and the commander became heavier; but they were within the capabilities of our maintenance knowledge, skill and procedures. Within the past 10 years, however, major changes have been incorporated into developmental tanks which include the latest state-of-the-art components. Hence, the birth of the *M551*, the *M60A1E2* and the *XM803* tanks. At the present time, no one can say with any certainty that the Army's maintenance system can cope with all this sophistication. To appreciate the sophistication being introduced by the latter two tanks, let us examine the *M60A1E2* turret.

The external configuration of the turret casting is unique, being designed on an in-line principle to provide greater ballistic protection. Its significantly reduced frontal area will make it less vulnerable to enemy fires. It presents no problems from the training or the maintainability aspects, other than reduced space makes it very difficult to get at some components.

The main armament of the *M60A1E2* is a 152mm gun-launcher, similar to the *M551*. The tube is the same, but the recoil mechanism is entirely different. The tank's present combat load of main gun ammunition is 33 conventional rounds and 13 *Shillelagh* missiles. The secondary armament includes the standard *M73* and the *M85* machine guns, with a combat load of approximately 5,500 rounds of 7.62mm and 1,080 rounds of .50 caliber ammunition. In addition, a bank of four grenade launchers is mounted on each side of the turret bustle. Each launcher can carry one grenade projectile similar to that in the *M551*, consisting of a WP *(M34)* grenade and a smoke *(AN-M8-HC)* grenade which are launched together.

The turret is stabilized in azimuth and its main gun, along with the coaxial *M73* machine gun, is stabilized in elevation. And, in turn, the gunner's sight is stabilized. At the same time, the cupola is independently stabilized in azimuth with its *M85* machine gun being stabilized in elevation. And, in turn, the commander's sight is also stabilized. That is, both gunner and the commander can engage separate targets in the stabilized mode while the tank is moving. Although this system is designed to operate primarily in the stabilized modes, a standard power mode is also available except that the commander has no override capability. These features are provided by an entirely new electrohydraulic stabilization system that is designed for rapid response, operating at approximately 2,000psi compared to the 900psi system in the *M60A1*.

Figure 1 is a diagram of this turret-cupola stabilization system. The details of the commander's station are shown at the top. Starting in the turret bustle, two power supply units (1) drive the two electronic packages (2) which are the hearts of the system, one for elevation and one for azimuth. As the gunner positions the main gun or the commander positions his *M85* machine gun using their respective periscopes and control handles (3), memory circuits in the electronic packages note the position of the main gun or the commander's machine gun. Any subsequent movement from this space orientation is measured by gyroscopes and rate sensors (4) positioned throughout the vehicle. These generate signals to the electronic packages (2) which, in turn, command elevation and traverse servo mechanisms to move the main gun or the commander's machine gun to keep them on their original space orientation.

The main gun elevation servo mechanism (5) makes necessary corrections in the gun's elevation; the turret traverse servo mechanism (6) moves the turret in azimuth; the elevation servo mechanism (7) and

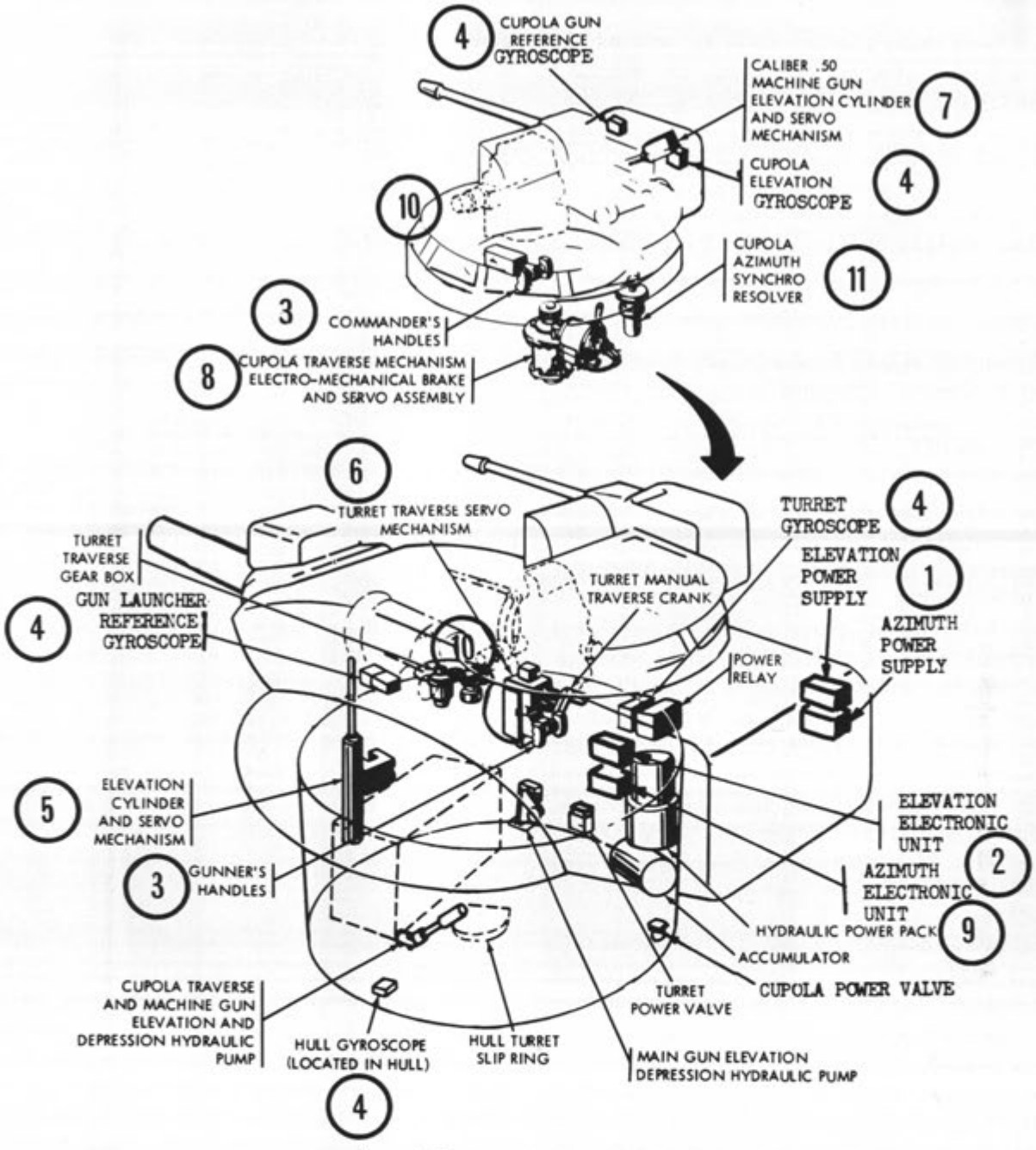


Figure 1. Turret-cupola stabilization system

traverse mechanism and servo assembly (8) in the cupola make necessary corrections in the commander's machine gun. The power to complete this movement is provided by a heavy duty hydraulic pack (9) to the rear of the gunner. One other significant feature adds to the capability and the complexity of this system. The commander's sight can be electrically aligned in elevation to the gunner's sight by means of a synchro (10) located on the commander's periscope and the gunner's periscope linkage. Likewise, another synchro (11) can be used to align the commander's sight to the main gun in azimuth.

These synchros provide two special capabilities. If the commander is laid on a target he wishes the gunner to engage with his main gun (or his coaxial machine gun), he simply has to activate a target designate circuit and the entire turret is slewed from under him, with the gunner's sight being laid on the commander's target. That is, the commander's sight retains its space orientation while the gunner's sight is moved to the target. On the other hand, if the commander for any reason wants to take control of the main gun, he simply has to place a selector lever in the main gun mode, and his station is slewed to the main gun with his sight being aligned to the main gun.

Having discussed the turret-cupola stabilization

system, let us now look briefly at the fire control system for conventional ammunition which is also entirely new in concept and design.

The heart of this fire control system is the ballistic computer, *XM19,* which: introduces super elevation; provides a means to individually zero four types of ammunition; automatically corrects for tube wear, parallax and drift; can correct for cross wind and cant; will accept a laser rangefinder input; and, in the stabilized mode, automatically introduces lead into the position of the main gun for a moving target without changing the gunner's sight picture. These capabilities are basically the same ones in the solid state computer which is being developed for the product improved *M60A1* tank (to be designated *M60A3*).

The *XM19* computer shown in Figure 2 consists of the computer unit, the gunner's control unit, the commander's control unit and the cant unit. The computer unit has subassemblies which utilize target range, ammunition characteristics, cross wind information, target azimuth rate, sight parallax, drift, zeroing, gun tube wear and vehicle cant to determine elevation and deflection corrections.

The gunner's control unit accepts range inputs introduced manually by the gunner, remotely by the commander, or automatically by a laser rangefinder. This panel provides the gunner with the capability to boresight his reticle and to independantly zero four types of main gun ammunition with the 10 potentiometer knobs on the panel's left. He may also manually introduce wind speed and direction corrections.

The commander's control unit provides him with the remote capability to manually introduce wind and range inputs and to select for firing any one of the four ammunitions that have been zeroed by the gunner. The four potentiometer knobs at the top of the panel enable him to boresight his reticle to the main gun and to zero his *M85* machine gun.

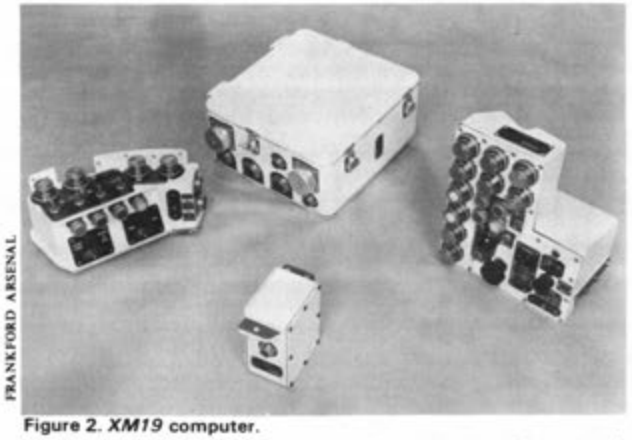


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Figure 2. *XM19* computer.
(Left to right) Commander's control unit, computer unit, gunner's control unit and cant unit (foreground).

The cant unit is mounted on the turret roof near the center of rotation and measures the degree of the trunnion's cant with a pendulum when the tank is in a stationary position. Through the computer unit, this angle is automatically translated into horizontal and verticle corrective movements for the gunner's reticle. This computer is electronically linked to this projected reticle in the gunner's periscopes, the *XM50,* shown in Figure 3.

This periscope is the primary sight for conventional ammunition and is designed to provide a daylight mode and a passive night mode of operation within the instrument. As such, it is large and complex in comparison to any tank sight now fielded. It weighs 75 pounds and contains 8 prisms, 10 mirrors and 16 lenses. It also contains an image intensifier tube which provides a passive night vision capability. It has a single, central-lay reticle which is projected into the gunner's field of view and positioned electronically for boresighting and zeroing by means of the potentiometer knobs on the gunner's computer control unit.

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Figure 3. *XM50* gunner's periscope

Almost all adjustments or repairs on this periscope must be made at the direct support or higher level of maintenance. The commander's periscope, the *XM51*, is designed basically the same and has the same capabilities, being packaged to fit the cupola. The primary missile sight is the *XM126* telescope which is similar in design to the telescope in the *M551.*

This tank will be the first one produced for our Army with a laser rangefinder. The components of

the *AN/VVS-1* are shown in Figure 4. The laser transmitter/receiver, the large item in the center of the figure, is located next to the main gun above

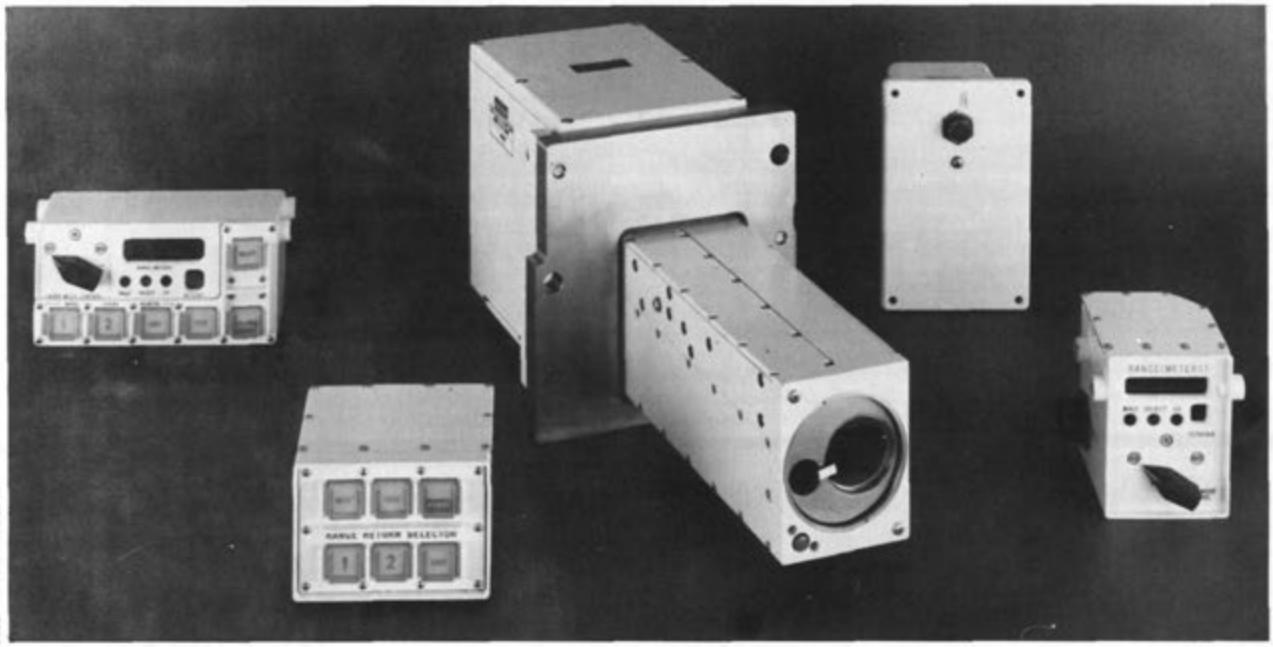

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Figure 4. *AN/VVS-1* laser rangefinder

the telescope with a separate aperature through the gun mantlet. Power is provided through the top-right component. Both the gunner and the commander will have the capability to lase with controls and indicators located at each station. The commander's are shown at the top-left. The gunner's are packaged in the remaining two components (bottom-left and bottom-right) to better fit into this station. The transmitter/receiver is boresighted with the gunner's sight, but the laser beam may be activated as either the gunner's or the commander's reticle is laid on the target with range read-outs being displayed at both stations. If the system is operated in the automatic mode, a returning echo is immediately introduced into the *XM19* computer, and the gunner's reticle is automatically positioned in super elevation and azimuth. The system can also be operated in a non-automatic mode.

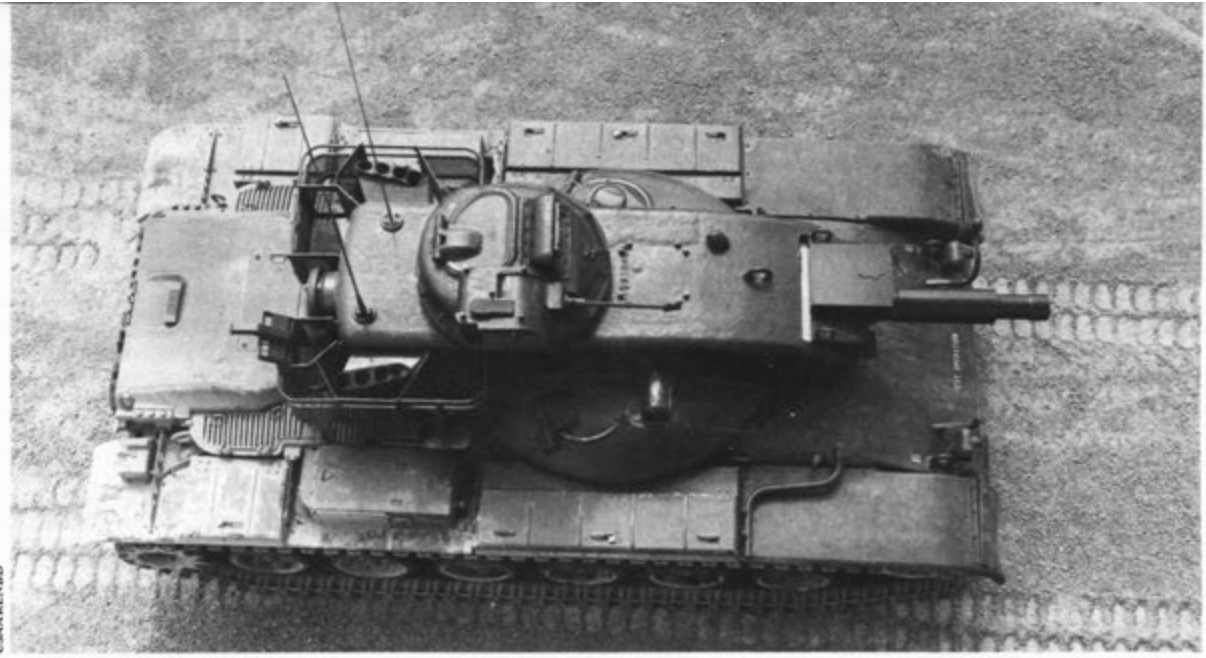
Having reviewed the stabilization system and the fire control system for conventional ammunition, the only major system in the turret remaining to be discussed is the guidance and control system for the *Shillelagh* missile. This system is the same one that is in the *M551*. Its functioning is classified. However, to give those unfamiliar with the *M551* some appreciation of its complexity, it can be stated that this is a command guided system, consisting fundamentally of an optical tracker, a rate sensor, a signal data converter, a modulator, a transmitter and a power supply. The gunner is supplied with a self-test checkout panel that gives a go or no-go indication of the system during his before-operation checks.

There are other minor systems in the turret that add to its total capability and complexity, such as the closed breech scavenger system. This turret is complex and far more sophisticated than any tank turret now in the field. With the production of the *M60A2*, Armor will be faced with new training and maintenance problems as it has with the fielding of most new equipment. Defining these problems is difficult. Assessing their scope and impact is more difficult. Experience gained during the service test, which included maintenance evaluation, gives some insight to these problems.

Looking first at the unique aspects of training that will be required for the crew, three points stand out.

- The training of the crew will be an easier problem to contend with than the training of maintenance personnel.
- The training required to develop and maintain proficient missile gunners will be almost identical to that required for the gunners of the *M551*. (A conduct of fire trainer for the *M60A2* will be fielded with the tank.)
- The training required for the gunner and the commander to develop and maintain their proficiency to accurately fire the main gun in the conventional ammunition mode will hinge around the stabilization system and the laser rangefinder.

Other special training requirements for the crew should present no significant problems. Although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some of the control panels appear complex at first sight, experience with average crewmen during service testing has demonstrated their ability to master which button or switch must be activated to obtain a required action without any concern for the intricate circuitry behind the panel.

Looking at maintenance training, the problem will stem from the new knowledge and skills required by the turret mechanic. The maintenance training of the crew, whose additional duties will involve relatively simple procedures, will present no significant problems. However, until the *M60A2* is fielded and sufficient troop experience is obtained, there is no way to fully assess its total impact on the training of maintenance personnel and on the Army's maintenance and logistical systems.

Significant progress has been made by the developers to facilitate turret trouble-shooting procedures and to develop test and diagnostic equipment which can be issued down to the company-size unit. In addition, the commonality which the *M60A2* will share with the hull-automotive components of the *M60* and with the *Shillelagh* components of the *M551* will somewhat ease the training and maintenance problems.

The Armor School has been studying the training aspects of both the *M60A2* crew and the turret mechanic. Stabilized gunnery tables have been devised and evaluated by the Weapons Department. Special turret mechanic courses are being programed to insure that graduates will be available with the initial fielding of the new tanks. Blocks of instruction on the *M60A2* will be included in officer courses in the near future. In essence, the Armor School is taking a positive approach and plans to keep its course work abreast with this electronic turret.

What problems may develop in the field away from the academic environment remains to be seen. In any event, the *M60A2* will give Armor a chance to live with an electronic turret before the more sophisticated *XM803* is introduced into the field. Perhaps this progression will provide a logical development of user experience and confidence that might belie most concerns of over sophistication.

On the other hand, the *M60A2* experience may convince Armor to revert to less sophisticated systems. Earlier, four questions were raised which I have not answered. I simply cannot. No one can. However, I suggest that the fielding of the *M60A2*, with whatever overall net gain or loss it may provide in combat readiness, will certainly generate a unique experience factor on an electronic turret of considerable sophistication. With this field experience, Armor should carefully review its entire development program for each major weapon system and re-examine the big trade-offs between sophistication and reliability.

LIEUTENANT COLONEL BART M. FILASETA is a graduate of the US Military Academy (1953) and the Armed Forces Staff College, and holds a master's degree in engineering. As Chief of Combat Vehicles of the Armor-Engineer Board at Fort Knox, he was responsible for the original service testing of the *M60A1E2*. Colonel Filaseta is now Secretary of Armor at Fort Knox and is responsible for the coordination of Armor Center Team actions on matters of armor doctrine, materiel and training.

Designed to continue improvements in the quality of training and combat readiness of mechanized infantry units, Fort Carson has initiated the Mechando School.

MECHANDO

by Lieutenant Colonel Robert J. Washer

It is a recognized fact that mechanized infantry, up to now, has had no symbol with which to identify itself. We, at Fort Carson, are attempting to correct this situation by adding flair to this aspect of the infantry and by becoming exponents of mechanized infantry. Our idea, an offshoot of the Recondo concept, is called Mechando.

For several years, Fort Carson has conducted a Recondo School. The valid theory of Recondo is that leaders can gain a high order of leadership competence by undergoing personal challenges using individual and small unit skills under dangerous and difficult conditions. Where this theory breaks down is in the practical utilization of these skills. Skills that are used under dangerous and difficult conditions should not be considered separate from those that must be mastered and used in the units to which these leaders are assigned.

Mechando combines the personal challenges of Recondo with the recognized needs of the mechanized infantry. Mechanized infantry company commanders in today's Modern Army are faced with

the need to train their small unit leaders to be able and confident in mechanized infantry tactics, maintenance, weapons and field operations. Knowing how to ski or rappel is of little value when an *M113* has thrown a track.

Realizing this need for a school designed to teach mechanized infantry skills, to develop a mechanized infantry elan, and to present personal challenges to officers and enlisted men, we have developed a course which will fulfill all these needs.

Mechando is actually a combination of schooling and tests designed to train individuals, squads and platoons as well as their leaders. The course consists of one formal school and two field tests. The formal school lasts only seven days, but is designed specifically to train the small unit leaders who will in turn train both individuals and platoons within his company. If the company commander is provided the tools to teach and test his men, he will produce the product our Army must have.

The Trackmaster School is a formal seven-day course emphasizing practical field exercises. Students arrive at the field location in track vehicles belonging to their units, with a minimum of five men per vehicle. All instruction is conducted in the field with students required to move to the many field teaching sites on orders received over their vehicular communications system. They must live in the field and learn to depend on their vehicle for their very existence.

The track commander is changed each day thus requiring all members of the team to exercise their leadership capabilities. Subjects taught include weapons, tactics, land navigation, maintenance, communications and survival. Students are graded on their demonstrated leadership and on individual and group performance. Those successfully completing the course receive the Trackmaster Badge. This symbol distinguishes a professional leader who has displayed the confidence and knowledge associated with a well-trained mechanized infantry division.

The Mechaneering phase of Mechando is designed to test the individual soldier of any of the combat branches. The soldiers are trained within their own units and request testing when they are confident they will be successful. The soldiers are challenged over a three-day period at a series of stations designed to test individual skills such as first aid, weapons proficiency, map reading, mechanical skills associated with their vehicle and tactical skills associated with their branch of service. The course includes live fire and physical stamina tests.

Much like the Expert Infantry Badge examination, this new concept not only tests the individual's combat skills but also the mechanical knowledge the soldier must master on the vehicle upon which he will rely in combat. This course requires a concentrated three-day period which not only tests the instructions given within the soldier's unit, but more importantly becomes a major training vehicle of itself

During the Trackmaster phase, all subjects are taught in the field forcing students to rely on their tracks for their very existence.

The Mechaneering phase is concentrated into three days of intensive testing which includes a live fire exercise.

that can be used by unit commanders. When a soldier successfully completes the course, he is awarded a Mechaneer Badge which will distinguish him from his contemporaries and should go far to raise his confidence and pride.

The Iron Horse 100 is the third phase of Mechando and is the unit training phase designed to test platoon size units of all combat branches. The exercise consists of a 100-mile course which challenges the leaders and the crews of all vehicles. It is an adventurous, competitive, and arduous test of man and equipment. The course consists of stations spread over the entire reservation. It requires absolute reliance on positive communications, navigational skills, aggressiveness, maintenance, and individual, crew and platoon tactical proficiency. In addition, the crew is required to fire all weapons within their TOE. When a platoon successfully completes the course, they are given a distinctive pennant to fly from their vehicles and are also authorized to paint an Iron Horse on their track. This award is good for one year.

In summary, what we of the Iron Horsemen have tried to do is give the mechanized infantry a real and honest training vehicle. We have given the company commander the flexibility of running his own training program and the tools to use, if he so desires. There may be better ways of doing the job—this is only a start. Perhaps the 4th Infantry Division (Mech) has provided the impetus for others to develop similar and better programs which will produce the pride in the product of mechanized infantry we must all have in the future.

The Iron Horse 100 is designed to test platoon-size units over a 100-mile course during which they are required to locate and clear an enemy minefield.

LIEUTENANT COLONEL ROBERT J. WASHER, a graduate of the US Military Academy (1954), Tulane University (1962) and the Command and General Staff College (1965), is G3/DPT of the 4th Infantry Division (Mech) and Fort Carson. His troop assignments include reconnaissance squadrons and command of the 3d Battalion, 77th Armor, and the 2d Battalion, 8th Infantry (Mech). In Vietnam, Colonel Washer was the Army Concept Project Officer for the *M551 Sheridan* Tank.

Introducing "P" Wood– 4th Armored Division

by John Albright

This division will attack and attack, and if an order is ever given to fall back, that order will not come from me.

Successful combat leadership is easily recognized in effective combat performance. Yet the exact identification of the ingredients of leadership is more than difficult. It is a highly personal thing; its exact substance shadowy, elusive, seemingly formless. Some basic elements are always there, but each commander mixes and applies them in his own way. Concern for the command is always present, and technological and professional competence are surely important. Trust in subordinates by the commander and confidence in the leader felt by those under him are essential— especially in Armor.

The best of these qualities existed in Major General John Shirley ("P") Wood, commander of the 4th Armored Division in World War II. "P" Wood's 4th Armored had no nickname, no gimmicky label.

For that powerful combat force, 4th Armored was name enough.

During early training days in the United States, "P" Wood decided that the division would gain its fame by deeds alone. That the division did as it cut through Europe in a Yankee blitzkrieg that shot from Normandy as the striking point of Patton's Third Army in the race across France. The 4th Armored Division awed the press, stunned the Germans, and maintained an unsinkable morale in ten months of combat. Following the run across France, the division intervened in the Ardennes to relieve besieged Bastogne, then swept to the Rhine, raced across Germany and into Czechoslovakia.[1]

Yet at the height of the division's exploits, its innovative commander, "P" Wood, was relieved and sent home. "P" Wood's story is one of imaginative and demanding training, dynamic leadership, and finally frustration and irony.

Much of what is firm armor doctrine today was developed, tested in combat, and perfected by Wood and his able commanders. From May of 1942 until the division entered combat in Normandy, Wood pushed it to the limit, demanding first-rate performance in training, and carefully constructing his fighting teams.

The principles guiding Wood were by no means universal in the Army of his day, and he could hardly have cared less. A professional who never ceased studying war, a career soldier who had seen rigidity of mind waste men's lives in frontal attacks in World War I, Wood carefully infused the division with his carefully considered techniques, aimed at gaining the victory with all the speed and firepower granted a technological Army.

His principles were few and easily summarized: audacity—indirect approach—movement in depth—disregard for flank security (movement in depth is security enough for a fast column)—movement of maintenance and supply with attack formations—maintaining personal contact—issuing simple mission type oral orders—not taking undue counsel of your fears—trusting trained men to do their work.[2]

During training, the units of the division learned to know each other as battalions within divisions

Soldiers of the 4th Armored Division arriving at Pine Camp, New York.

seldom do. Wood taught the division to form and reform task forces on the move, to expect most orders to come by radio, and to operate without detailed written directives. He worked the combat commands and the battalions to the point where the voices of commanders were recognized by each other—authentication by familiarization. Speed in flanking movements—in breaking loose behind enemy lines, in the pursuit and exploitation, and in fire and maneuver—was constantly stressed. In the California desert in 1943, Wood kept the level of training intense with physical conditioning and tank-to-tank rolling battles where opposing forces fought with live .30-caliber ammunition slapping against "buttoned up" turrets. Maneuver, speed and competence in the basics of the military art, all practiced again and again and again.[3]

By the time the division entered combat it was ready as few have ever been. In an address to the troops shortly before the 4th Armored left the United States for England, Wood gave his troops his concept of armor, and the words embodied the spirit of the 4th Armored retained for the rest of the war: "This division will attack and attack, and if an order is ever given to fall back, that order will not come from me."[4]

Its first few days of combat saw the 4th Armored bursting south from First Army lines to capture a series of bridges and dams on the Selune River, just south of Avranches—the key to freeing American forces bottled up in the Normandy peninsula. Though the enemy defended the town of Avranches strongly, the division took the town and held it against armor counterattacks.

As Combat Command B was attacking the town with part of CCA assisting, the order came from division—verbally, not written—for CCA to attack immediately and seize the vital bridges and dams on the Selune. Forming task forces by radio orders, the combat commander had four separate groups moving within the hour. Two of the bridges fell to the first rush of the attack, but two of the task forces had to outfight and outmaneuver SS troops to capture their objectives intact. The next day, other troops of the First and Third Armies poured into the now wide-open fight. The inexperienced men of the 4th Armored had proven the value of their strenuous training and had moved decisively, exploiting the enemy's confusion and ramming home their assault.[5]

At this point Wood displayed a high level of that strategic touch that division commanders—who live in the worlds of both tactics and strategy—must have. Sensing that Brittany was not now the key—that a peninsula was not the proper field for a wide-ranging armored force—and that the tenacious defense the Nazis had lodged against the Normandy beachhead had weakened them greatly, Wood urged the Army and Corps commanders to send the 4th Armored's tanks east into the heart of France. After no little delay, Wood finally got the word to go. His superiors, to include George Patton, finally agreed with him, at last seeing what Wood had discerned days before. From that time on, the twin columns of CCA and CCB were rapidly on the move.[6]

In the ensuing weeks, examples of flexibility, ingenuity, dash and above all—mobile firepower—were provided to the bewildered but stubborn Germans, as the division's combat commands and task forces changed configurations on the move and kept rolling all the while. Wood often directed the moves personally after landing alongside a column in a Piper Cub plane.

With tanks usually in the lead, Wood's columns would move along secondary roads catching fleeing enemy units on the main road in the flank, bypassing road blocks, and sweeping on. All the while, maintenance and support teams and medics rolled along with them. It was not uncommon for

Tanks and infantry near Berg, France.

maintenance columns to fight bypassed pockets of enemy that the lead combat units had left behind.

Artillery moved with the lead columns. Crews of the renowned "Priest" self-propelled 105mm howitzers often fired their fifties at soft targets that presented themselves, and just as often pulled off the road to fire missions at the request of forward observers flying overhead in Piper Cubs or riding with the tank and armored infantry columns.

Frequently the way was smoothed by *P47 Thunderbolts* of the XIX Tactical Air Command ranging ahead air cavalry style to attack targets marked by air controllers riding with the tanks or by the artillery spotters in their light aircraft. The incredible success of the newcomer to combat was an obvious payoff of long months of practice developing confidence and mutual understanding, of imaginative and highly competent leaders at all echelons, and of the driving spirit of the commanding general.[7]

In September tank battles in Lorraine, and in hard fighting that followed the pursuit in October and November, the division operated in canalizing terrain against a strong and resourceful defense. Precision in tank gunnery, fast but accurate planning, close tank-infantry coordination: all were important in the cold, crud and mud of the fall of 1944.[8]

It was in early December that Wood was relieved, and with warm assurances of confidence by Patton and Eisenhower, went back to the United States to rest. Abrupt and stunning, Wood's relief has given rise to much speculation. Never fully explained, it seems probable that the reason stated most often was the correct one. He was a tired man. Admired and appreciated by Patton and adored by his men, why otherwise would he have been dismissed?

Certainly Wood, his troops and their equipment were all tired, all in need of rest and repair and time. The troops did get the rest although it was interrupted for the order to move to Bastogne only a few days later. If Wood could have rested with them, perhaps he would have remained.

Perhaps—as some sources have it—Wood was too loyal to his men, too much their defender. It was well known that Wood had little patience for dullards, whatever their position. Impatience with those he considered unimaginative commanders—often his own—had not endeared him to all.

That Wood was weary and exhausted by the demands of leading his wide-ranging command is uncontested. It is well known too that all who approved the relief were saddened by what they saw as the necessity of their action.[9]

The blow fell hard on the division, which seemed almost to grieve for its departed commander. Yet the professionalism in the inspired fighting force remained with it, and under two succeeding commanders, each quite capable, the division moved ahead.

The relief, executed by George Patton who valued Wood as his finest Armor commander, and who made more than full use of the 4th Armored, is tinged with irony. Until the whole story is known, it will have something of an air of mystery about it, as

The 4th Armored rolls toward Bastogne, Belgium.

well as irony—that this Armor leader was dismissed by a man who so greatly appreciated him.

The frustration must have been bitter to "P" Wood. In the United States, he assumed command of Fort Knox and trained Armor soldiers for the battles he so much wanted to fight. Yet the final satisfaction must have rested with Wood, as he saw his techniques adopted by his successors and watched as the division that was still his in style, elan and performance fight across Germany.

The final statistics for the 4th Armored Division suggest mathematically that the unit had something good going for it: the division captured 90,000 Germans, killed 14,000 and destroyed literally hundreds of tanks, self-propelled artillery pieces and other vehicles. For this the hard charging and attack-oriented division—in proving the adage that safety lies on the enemy's side of the hill—paid the comparatively mild price of 1,519 killed, less than the daily death count of some infantry divisions in World War I.[10]

The ensuing years saw many of Wood's subordinnates rise high in the Army, among them Creighton Abrams and Bruce Clarke. Wood knew how to pick good men, inspire them and direct their development into innovative and strong commanders.

Infantrymen of the 4th Armored pass a burning German half-track.

John Shirley Wood gave modern Armor much of its unique quality, so much so that it seems that the essential spirit of Armor today began with the highly professional career soldier who took command of a mixed group of inductees, old Army noncoms, reservists and a few regular officers, and blended men and machines into one of the finest organizations in the long and proud history of American arms.

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8. Lieutenant Colonel Evar P. Peterson, et al, *Armor vs. Mud and Mines* (Fort Knox, 1950); see also Hugh M. Cole, *The Lorraine Campaign* (Washington, 1950).
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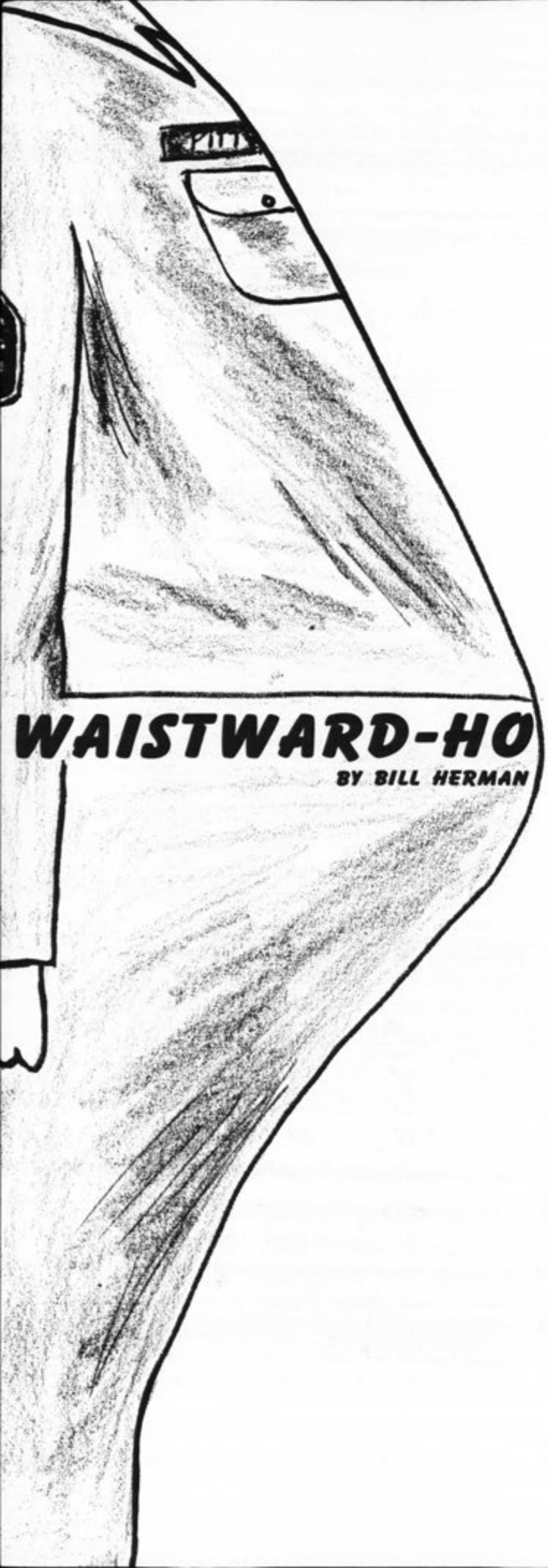
JOHN ALBRIGHT, who received a BA degree from Oklahoma State University and is now engaged in graduate study at The American University, served in Vietnam as a captain in the 11th Armored Cavalry Regiment. He has served three short periods in Vietnam as a civilian historian while employed in the Office of the Chief of Military History.



WAISTWARD-HO

BY BILL HERMAN

THINGS were looking bleak again for Sergeant Pitt. His cozy, friendly world at the Armor Center had suddenly turned hostile—the command had embarked on another "Get Off The Fat" program. He was again confronting the spectre of compulsory diet and vice versa.

More than the challenge to his unique eating talents, Pitt hated the part of these campaigns he called the "Snide Show". This was the poster and slogan publicity accompanying them. Things like:

Tankers Should be Lean and Mean.
Get Off The Flab—Dab-by-Dab.
You Diet or WE Do It!
Push-aways or PUSH-UPS!

Besides being too square, Sergeant Pitt felt the slogans all pointed a fat accusing finger at the globular himself. This deep inner dread was no mere fantasy because for the sergeant (nicknamed "The Pitt" or "Bottomless Pitt"), eating was more than a hobby; it was a way-of-life.

Where some men might wake in the night, smoke a cigarette and go back to sleep, Bottomless Pitt would set his clock to get up and pop a can of sardines and open a jar of olives. No need to debate it—he was a food addict. Next to eating between meals, Sergeant Pitt loved his progressive regular meals that took him on seemingly aimless meanders around the Armor Center. With the aid of his uncanny telegraph system, he would know exactly which mess hall was serving something done his favorite way (what they were serving he already knew since he studied the master menu with a devotion matching a broker reading Dow Jones). He had special intelligence on mess halls that were departing from the master menu. Thus, during a few serving hours per day, The Pitt would make carefully scheduled glancing assaults on several messes at the Center. It was said by many who knew him, that on a good day he could make more mess hall stops than a healthy garrison dog.

Next to eating indoors in benign surroundings, Bottomless Pitt liked to eat outdoors. When the tankers took to the field, he always straggled (or had benign vehicle breakdowns) near unit mess tents whose menu or culinary reputation he knew intimately.

The Pitt, in short, was not only a creative eater—he was also an endurance eater. It must be admitted that if the United States had an Olympic eating team, Sergeant Pitt would have been its decathlon member!

But now he was faced with a familiar dilemma—a command-wide weight program of serious propor-

THE FOUR-LETTERMAN

tions. Throughout his Army years he had—craftily or clumsily—survived many such threats and emerged with his same sleek, hemispheric profile. On opening day of one such "Get Off The Lard" campaign, he promptly reported himself into the post hospital with an old war wound—and gained eight pounds by the time the program folded.

On another occasion, he got himself transferred temporarily to a unit going on a short maneuver and returned to the Center hale and heavier. Once, too, he wangled permission to move off post where he supported his cavernous appetite by winning eating contests (and still went hopelessly in debt before the diet program fizzled).

But here was a new program, espoused by a new commander; a thin, sinister man who was determined to see results, not mere menu plans and programs. He quickly disclosed some diabolical schemes for getting results—and The Pitt's layers of joviality were his primary objective. At this news, the whole Center responded, the "Beast of the Mess Halls" had met his match. Large but undisclosed sums of money were wagered in many clubs and day rooms throughout the Center as expressions of confidence or doubt that Sergeant Pitt would find a way to outwit this new commander. Tension quickly mounted to see how the global trencherman would side-step this newly created program and its horrendous promotion posters (the new CO's own original was "Away with the Bay!").

Suddenly The Pitt did a surprising and uncharacteristic thing. He capitulated and embraced the weight control program wholeheartedly!

After the screams of anguish among the money-changers in the temples, clubs and day rooms died down, it was disclosed that Pitt succumbed with, naturally, one reservation. He had the new CO agree to allow him to depart from the strict Center's diet for one of his own. The CO was unconcerned since he, too, had a reservation—that Pitt show him some results . . . and in one week.

After this trying gentleman's agreement, Pitt went promptly (and naturally as a lemming) to the nearest mess hall where he fell to what was assumed to be his last full meal. But it was only the beginning of an eating spree such as the Center had never witnessed. He out-ate himself . . . even his simple coffee breaks became Roman banquets!

Thus it was natural, that after a few days of observing this reaction, the Center's Pitt watchers became sure of his plan to lick the new CO. Pitt was deliberately attempting to force his own retirement from the Army, and was doing it in his own quaint style—by eating his way out the gate!

But at the appointed hour of the first week, Sergeant Pitt presented himself to the commanding officer who was amazed to see a suggested looseness around Pitt's belt and collar. To questioning about his diet, The Pitt referred cryptically to his special pills whereupon the CO asked that he present himself again in a week with more conclusive proof that his

THE NEW CO WAS A THIN AND SINISTER MAN.

diet was working better than the Center's "Scat The Fat" program (This, too, the CO's own slogan).

And The Pitt complied.

A week later, to the CO's complete and unmasked astonishment, there stood before him not the angle-

less, taut-uniformed mass of noncommissioned flesh, but an array of government wrinkles. There was now an unmistakeable bagginess in the seat of Pitt's trousers, while clusters of wrinkles were gathered-up around his waistband. Even his shirt collar had a rim of wrinkles contained by his necktie.

The CO's amazement turned to sheer delight. His questions regarding Pitt's reducing pills were at first officially oblique, then pointedly personal with a subdued desperation. But Pitt fended off both threats and bribery regarding the nature of his reducing methods. The CO said, "You know, sergeant, you may make a mockery of my program—or the whole science of dietetics." To Pitt's promise to take off eight—even ten—pounds for next week's inspection, the CO begged him to take off only five more and offered to relieve him of further reducing (in exchange of some information on his methods, of course). Pitt still refused but promised that he would report to the medics if he felt any strange effects or reactions from his amazing diet.

But Pitt's only reaction was the usual—famine-driven eating.

Life was never more lush and sweet for Pitt. Next to eating, he liked his beer dark and bountiful (and a wag noted that the local brewery took off the night shift when they heard Pitt would comply with the "Down The Pounds" program). But now Pitt would hold court each night at the NCO Club, matching his vast capacity against all who would ply him with schooners of ale in hopes to perhaps purloin from him the secret of his magic diet.

But each night Pitt would simply grunt himself upright, and with a belch of blissful well-being, slowly tread past their prostrate bodies and waddle to his quarters—via a friendly mess hall, naturally.

The CO sucked in his breath in honest terror when Pitt lurched into his office the next week. Before him stood an apparition. Pitt was not wearing his uniform, he was merely supporting it like the poles of a teepee. The seat of his trousers hung in folds like an unstrung hammock. His waistband was a choke-up of unsightly wrinkles. The drapery that was his shirt emitted his neck at the collar like an oversized stovepipe hole in a roof.

The CO, tending toward panic, gently ushered Pitt to a chair and offered to call his medical officer. Pitt countered with an offer to take off ten more pounds. The CO bellowed in anguish for The Pitt to stop the obviously effective pills. The Old Man's bellow brought in his adjutant and with him the

quartermaster who had just come to see the commander.

This coincidence was Pitt's downfall. This and a pure turn of Fortune's wheel.

The quartermaster, in a twist of poetic fate, had uncovered the secret of Pitt's magic diet. During a routine spot check of sales slips at the clothing sales store, he discovered that Sergeant Pitt had recently bought four new uniforms: one two sizes too large; one two more sizes larger; and one six times his size.

Pitt has yet to wear the one *eight* sizes too large . . . but he may make it.

BILL HERMAN was a former heavy tank and recon troop commander and now is a civilian information officer with Headquarters, Combat Developments Command at Fort Belvoir. He is currently working on two books, *Captains Outrageous* and *No Machine Guns in the Living Room.*

The assault gun, despite its poor reputation acquired in the past through misinterpretation of performance and frequently through misuse, would be a valuable addition to the mechanized infantry. Its concept was proven and abandoned . . . it deserves another chance.

the mechanized infantry assault gun

by captain timothy r. o'neill
captain alfred t. bowen jr.

THE mechanized infantry battalion needs a highly mobile, well-protected, direct-fire weapon capable of destroying enemy weapons and fortifications. While the TOW platoon may prove to be an admirable tank destroyer, the vulnerability of its launcher and carrier to enemy fire, and the high unit cost of ammunition eliminate it for this mission. Heretofore, the mechanized infantry has had this capability through the cross-attachment of tanks, but tank resources are often drained by secondary missions that could be handled more simply and economically by organic elements. These could be handled by the long-abandoned and much maligned assault gun.

The assault gun, a turretless gun carrier designed for close support of infantry units, is a widely discredited concept. Recent developments in the field of turretless vehicles have been few and far between, and not closely related to the assault gun concept. The Swedish *S-tank* is essentially a turretless tank. The German *Jagdpanzer* (Kanone) and Russian *ASU85* are tank destroyers, and their design emphasis was placed more heavily on the characteristics needed for this mission than on the tradition assault gun role.

Some turreted vehicles have been put to assault gun tasks—for example, the Swedish *IKV91* (*ARMOR*, May-June 1971) which, though configured as a light tank, is intended for infantry support. The *IKV91*, however, is a complex and sophisticated vehicle specially designed to meet a local need, and by no means the herald of a trend.

Additionally, there has been a tendency to upgun the developing generations of infantry combat vehicles, in the hope of giving the MICVs an inherent assault gun capability. The most obvious example is the Soviet ICV which appeared in 1967 with a small turret mounting a 76mm short-recoil gun, along with antitank missiles and an infantry squad. This approach, however, leads invariably to compromise of either or both of the fundamental capabilities, and hence overall degradation of performance.

The most common reasons cited for the assault gun's poor reputation seem to be:

- The tendency of the assault gun to be a cheap tank substitute with very limited effectiveness against conventional turreted tanks.
- The vulnerability of turretless guns to fire from the flanks due to the necessarily slow traverse.
- The current concept in the US Army which provides for flexible cross-attachment of tanks to support the infantry.

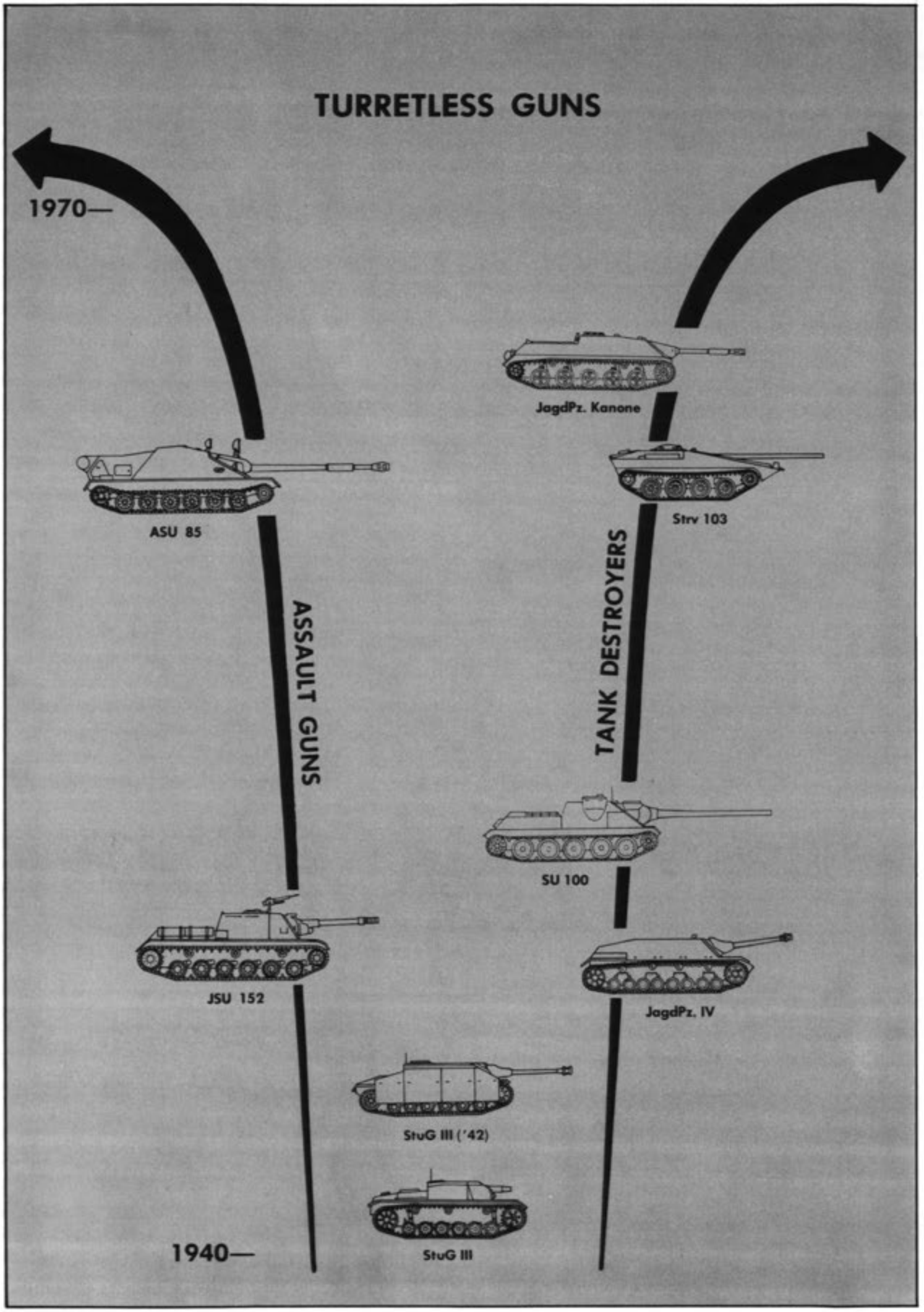
The first argument is based on the erroneous assumption that the assault gun's mission is to destroy tanks.

The assault gun was first fielded by the German Army in 1940 as a means of providing infantry formations with an armored, heavily armed weapon without dissipating tank resources. The *Sturmgeschuetz* (assault gun) was deployed in the armored infantry battalion and in separate assault gun battalions at various higher levels. Based on the proven *PzKw III*, the *StuG III* originally mounted a short, low-velocity 75mm gun which was suited solely for infantry support. This was replaced in the spring of 1942 by the 75mm *StuK L/43* high-velocity gun, a modification which greatly improved its capacity for dealing with the contemporary Soviet armored vehicles. Despite the upgunning, the basic mission of infantry support had not changed. That the *StuG III* was used as a tank destroyer is a testament to the flexibility and staying power of the system and, of course, to the vast number of Soviet tanks against which the Germans were obliged to employ everything available.

During this period, the tank destroyer emerged as a specialized divergence from the assault gun family. Most tank destroyers of World War II were turretless but, while their appearance resembled that of the assault gun, their mission was quite different.

The development of the first tank destroyers by the Germans was a desperate answer to the overwhelming flood of Soviet tanks. Turretless tank destroyers were cheaper and could be stamped out and rushed to the front faster than the more complex turreted tanks. As they were obviously inferior to turreted tanks of comparable size on a one-for-one basis in a running battle, and were almost always outnumbered, they soon became defensive in application. This defensive employment and reliance on turretless, casemated vehicles contributed to the family of massive, virtually immobile tank destroyers such as the *Ferdinand (Elefant)* and lumbering *Jagdtiger* of late 1944.

Note that while the tank destroyer became a de-


TURRETLESS GUNS
1970—
JagdPz. Kanone
ASU 85
Strv 103
ASSAULT GUNS
TANK DESTROYERS
SU 100
JSU 152
JagdPz. IV
StuG III ('42)
StuG III
1940—

fensive weapon, the assault gun remained an offensive one. Most basic works on the subject tend to link them together in blanket condemnation. Reference is almost always made to the *Elefant*; only one or two point out the marked success of the *StuG III*.

The assault gun should be reintroduced in its original role. Its specific mission: *To provide close direct-fire support to the mechanized infantry against enemy fortification and other appropriate targets in the offense; and to provide direct-fire support from covered and concealed positions, to include limited antitank support as a supplement to the battalion antitank platoon in the defense.*

The weapon should be included as an organic platoon formation at battalion level. If, as an alternative, it were introduced as a divisional assault gun battalion, the natural tendency in practice would be to use the weapons in large formations as tank destroyers instead of attaching them to the battalions where they belong.

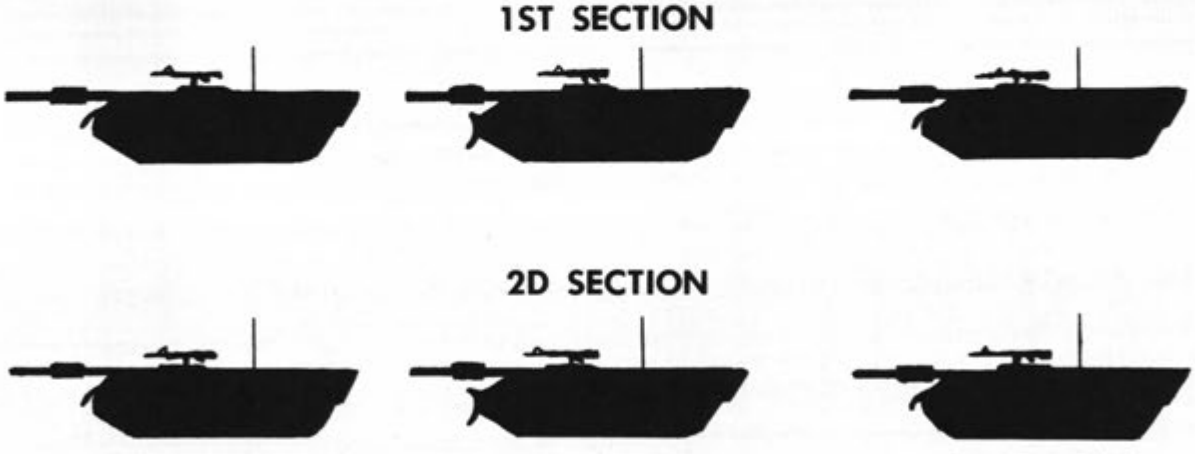
The assault gun platoon would consist of six vehicles in two sections of three vehicles each. This number has been chosen deliberately. It is large enough to allow two sections to operate separately with each of two lead companies if required. Three vehicles were considered to be the minimum number necessary to protect itself in the offense and provide all-around defense. If the platoon were larger, a span of control problem would exist.

time to time to supplement the TOW platoon, its normal mission of infantry support would preclude its effectiveness as a tank destroyer in the offense.

The following materiel requirements should guide the development of the Mechanized Infantry Assault Gun (MIAG).

It is *essential* that the system possess:

- A main armament system capable of: destroying prepared field fortifications; engaging and destroying armored vehicles at ranges approximating those of the proposed Main Battle Tank; and engaging enemy infantry with cannister at close range and with HE or other suitable rounds at longer ranges.
- A secondary armament system capable of providing security against enemy infantry and light vehicles at closer ranges with 360 degree coverage.
- Sufficient armor protection to shield the crew from: small arms and automatic weapons fire up to 23mm from the front, and small arms up to 7.62mm from the flanks and rear; and shrapnel caused by proximity fuzed artillery rounds from 50 meters vertical distance.
- Sufficient mobility to accompany all combat vehicles of the mechanized infantry battalion to the maximum limits of trafficability.
- Gross weight should not exceed 18 tons.
- Maximum commonality of automotive components and repair parts with the adopted Mechanized Infantry Combat Vehicle (MICV).



The assault gun platoon would consist of six vehicles in two sections of three vehicles each.

The platoon leader's MOS would be 1203; the enlisted men, 11E. The platoon would be manned by 1 officer and 29 enlisted men.

It should be stressed that the assault gun platoon does not in any way replace the antitank (TOW) platoon of the mechanized battalion. Though the assault gun might necessarily be employed from

It is *desirable* that the system possess:

- Maximum practicable protection from currently existing chemical and kinetic energy rounds to the front, and chemical energy rounds and automatic weapons fire up to 14.5mm from the flanks, consistent with the weight and mobility requirements.

• Common ammunition with the proposed Main Battle Tank.

• Capability of fording, without preparation, inland waterways to a depth of 4 feet.

• The capability of crossing inland waterways deeper than 4 feet by use of either a flotation kit or deep-water fording kit.

The MIAG system envisioned by the authors as being the simplest and most economical answer to the materiel requirements is a track-laying, armored, turretless gun carrier based on the same automotive components—engine, transmission and suspension—as the MICV, a feature which allows a more compact PLL within the battalion and requires less diversification of organizational mechanic skills.

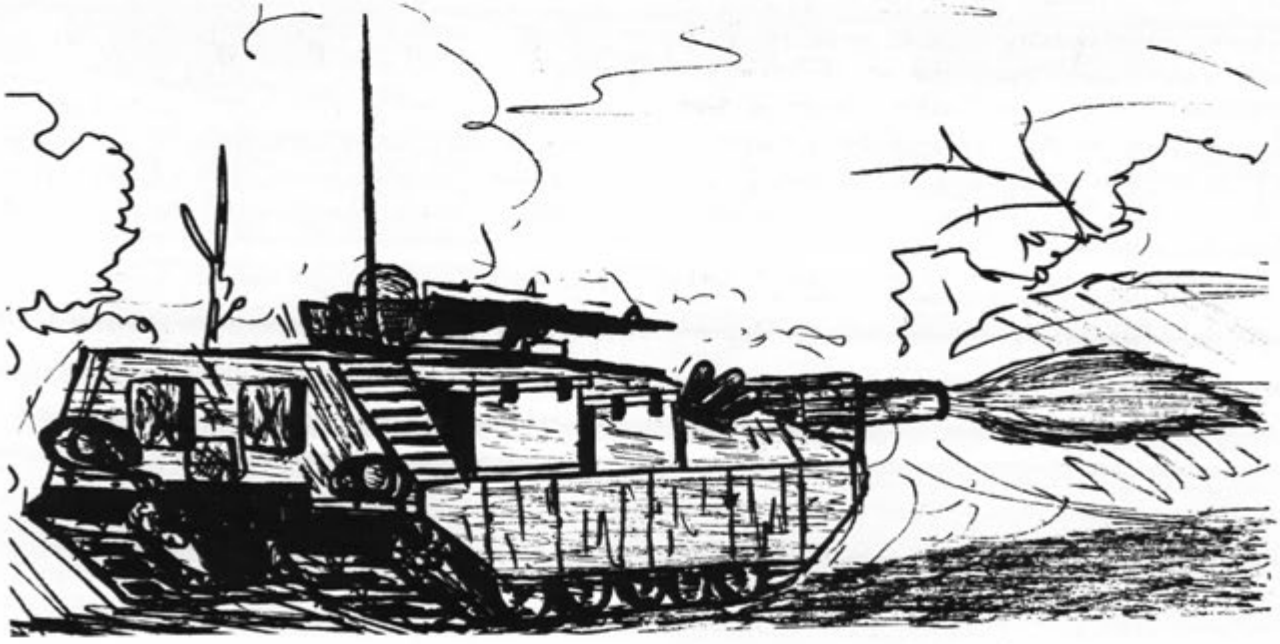
It is turretless because this configuration is simple and economical while still adequate for its intended mission. Those who would argue that the same result could be obtained by introducing the off-the-shelf *Sheridan* in this role are reminded of the expense, complexity, lack of automotive commonality (probably) with the MICV, and uneconomical duplication of the TOW capability.

The main armament of the MIAG is a 152mm gun, identical to that carried by the *XM803* (less missile particular components). This gun was chosen because of its extremely powerful round (both authors have observed the devastating effect of the HEAT-MP-T round on bunkers during operations on the DMZ) and relatively short tube length, which is a necessary concession to maneuverability in a turretless vehicle. The missile system has been dropped because it would add weight, take up valuable space, lower maintainability, and reduce the number of rounds which could be carried in the basic load. The number of basic load main gun rounds becomes critical when viewed vis-a-vis the weapon's offensive employment. The missile system is primarily an antitank weapon, and the TOW platoon already possesses that capability, rendering the addition of the *Shillelagh* an expensive duplication of effort.

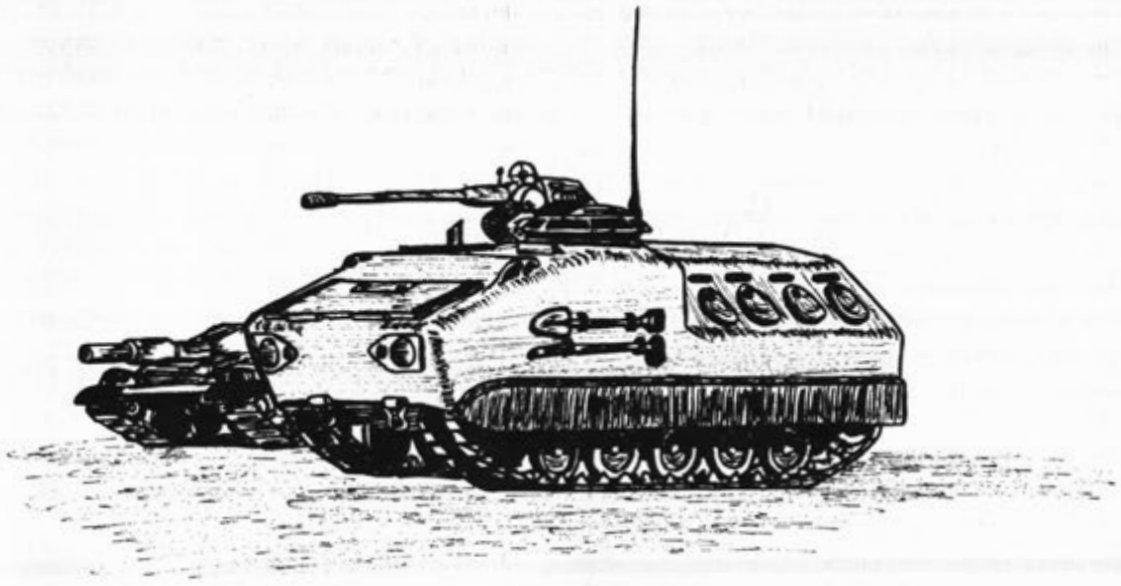
The tube would elevate from +30 to −10 degrees, but would, like all turretless vehicles, possess limited traverse (±10 degrees), bolder changes in azimuth being accomplished by pivoting the vehicle. The semifixed gun mount and hydraulic suspension of the *STRV103* have not been adopted. These characteristics are useful for a weapon with an automatic loader, but otherwise add weight, complexity, increase maintainability headaches, and eliminate most points of commonality with the MICV. We feel no need to decrease the crew by adding an automatic loader, in fact, a fifth crew member has been added.

Ammunition is the same as that proposed for the *XM803*, HEAT-MP-T, WP, HVAP-DS-T, and cannister. A time fuzed beehive round on the order of that issued in Vietnam for the 90mm gun tanks would be desirable but not essential.

The fire control system uses a laser rangefinder combined with the same digital computer used in the *M60A1E2*. A secondary system uses an articulated telescope with stadia reticle. There is no stabilization, as this vehicle would not wisely be fired on the move. A combination 360 degree periscope and 10-power binocular periscope (similar to a BC scope)



A main gun armament system capable of destroying prepared field fortifications . . .



The MIAG must have maximum commonality of automotive components and repair parts with the adopted MICV.

are provided to the commander for target acquisition. A low light level sight is also installed.

The secondary armament system consists of two *M60* machine guns. One is placed at the commander's station and the other opposite him and slightly to his rear at a position manned by a machine gunner, whose sole task is to protect the vehicle from enemy infantry. Both are provided with optical and mechanical linkages which allow them to be aimed and fired from inside the cupolas. No coaxial weapon has been provided due to the slow and limited traverse of the main gun.

In deciding on the necessary armor protection, it was assumed that the vehicle, to have an acceptable degree of survivability, must be protected in front from automatic weapons fire up to 23mm. This decision was based on the high density in Soviet formations of weapons of this caliber. These, though intended primarily for antiaircraft protection, would inevitably be incorporated in the defense in an armor-defeating role.

The weight of armor necessary to provide such a degree of protection can, as always, be reduced by the use of special materials and low obliquity. The armor is laminated steel/aluminum.* The hull resembles a meat cleaver. The front profile is low and sloped at a very low obliquity. To protect against chemical energy rounds from the front, a hinged grille, cleft in the center to allow for the gun tube, is attached near the front edge of the glacis. This can be erected as required, and folded down to protect the grille in wooded terrain. The top edge of the grille, when erected, is even with the lower edge of the gunner's primary sight aperture.

The flanks are protected by ballistics skirts of mild steel, and when combined with the hull overhang, provides a perpendicular standoff of 18-24 inches. This standoff dramatically increases, of course, as the angle of attack of the HEAT round becomes more acute. In addition, when combined with the sponsons on the upper hull, the ballistic skirts provide excellent flank protection from HEP rounds, and the capability of defeating 12.7mm AP-T from the flanks becomes a possibility. The suggested alternative of adding detachable bar armor on the flanks was discarded. This, as with the similar hinged armor in the front, provides good protection against chemical energy rounds. However, it lessens the protection from automatic weapons fire and, since it cannot be folded away handily like the frontal grilles, is likely to have poor durability in wooded terrain.

As previously stated, the sponsons attached to the flanks provide limited standoff. The weakest point on the flank is the commander's cupola, which is offset and projects over the right side of the hull. This offset position is necessary for clearance of traverse, and does not project more than 6 inches over the top of the hull, thus reducing frontal area.

The automotive characteristics will probably follow the MICV. The engine is expected to be diesel, and is rear-mounted to allow the advantageous ballistic shape and provide counterweight for the

**The data with respect to armor-defeating capabilities and exact mix are unavailable.*

frontal armor. The idea of a front-mounted engine and rear-mounted gun, the latter being allowed movement by a peculiar cleft hull arrangement, was discarded for reasons too numerous to mention in an article of limited scope.

The suspension might use tube-over-torsion bar suspension. Road wheels would be large enough to eliminate return rollers. Such a combination would, of course, use dead track.

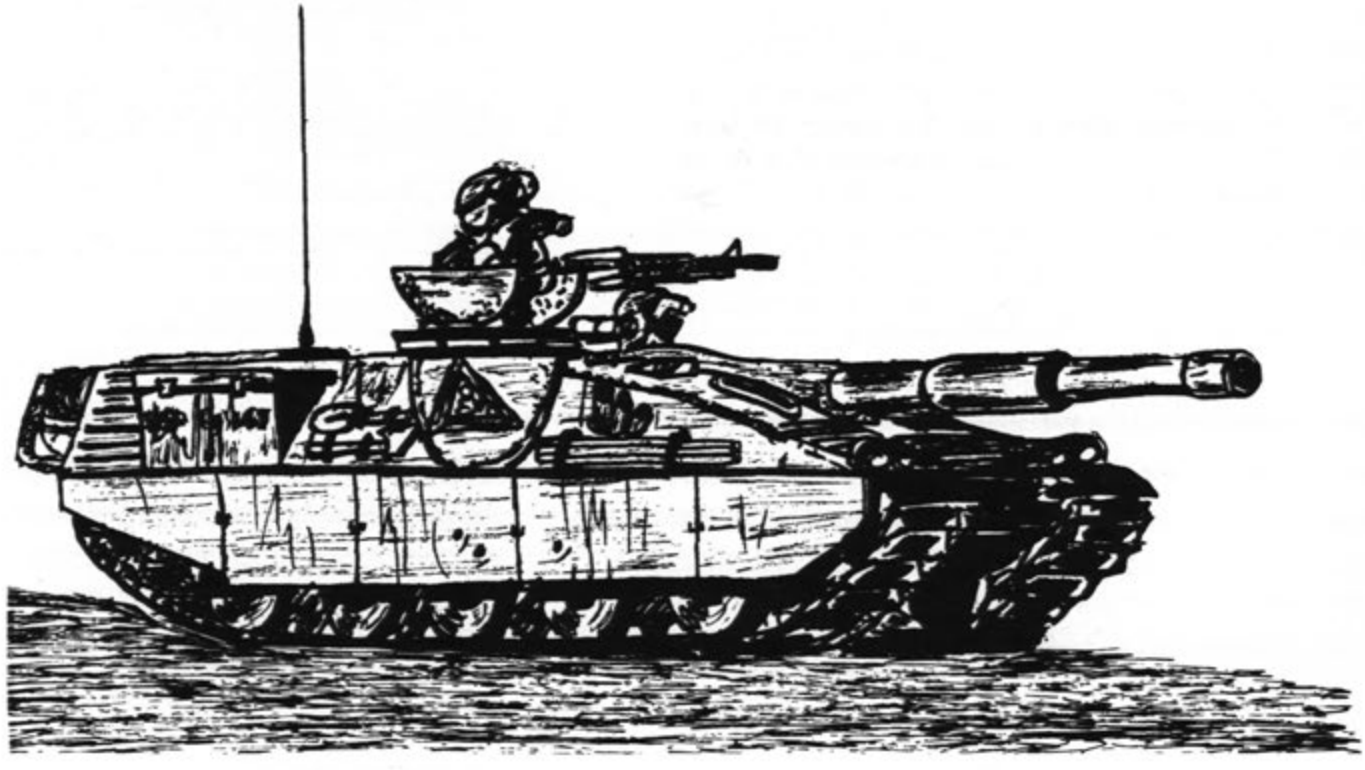
The crew consists of five men: vehicle commander, gunner, loader, machine gunner and driver. It would not be the most comfortable vehicle in the world. The flat hull would require the gunner and driver, who are stationed towards the front and in the beginnings of the frontal slope, to ride in a semi-reclining position. The driver's hatch may be opened under routine march conditions to allow the driver to tilt his seat upright and ride with the head exposed. The commander is at the right of the vehicle, in an offset cupola. The gunner enters and exits through the TC hatch, and sits in front of and slightly below the TC. The loader enters through a hatch to the left rear of the TC position and sits to the right rear of the breech assembly. The machine gunner's station is opposite and slightly to the rear of the TC.

The other marked advantage of the five-man crew is that the MIAG would have to sustain the loss of three of the five crew members before absolutely having to call it quits.

The primary consideration in the tactical employment of the MIAG is its basically offensive nature. It is not, as pointed out earlier, a tank destroyer. It is to be used in close support of infantry mounted MICVs, giving that branch the armored punch it has heretofore acquired only through cross-attachment. This is not to say that we advocate abandonment of team and task force, this would still be done habitually to tailor formations to their mission requirements. What the MIAG does provide is a built-in package of firepower, mobility and shock action for the mechanized battalion to prevent waste of tank assets in missions that do not absolutely require tanks.

In the offense, the weapons would be deployed forward, usually attached to the lead companies. They might be broken down into sections to provide balanced capabilities to both lead companies, or the entire platoon might be attached to one company to weigh a main attack. These units would accompany the lead elements and perform the necessary functions—engagement of enemy fortifications and weapons positions—while antitank overwatch is provided by the TOW platoon.

In the defense, the MIAG would begin to function more actively in its secondary antitank role. The platoon would be attached to the reserve company in a battalion defensive position, or positioned as part of a battalion blocking force. The latter employment would provide the necessary firepower to canalize the enemy into killing zones without the squandering



of tank resources which would be better applied to the counterattack force. They would be best employed in this case from defilade positions.

The number two and five vehicles have been provided with dozer blades for this purpose. Two out of six assault guns have been given this capability as opposed to one out of 17 in the tank company. This was done for two reasons: (1) the platoon, as previously stated, will often operate in two separate sections with each of two mechanized companies which have no blade capability, and (2) as these vehicles would be used in many cases to bolster strongpoints gained by offensive action in the enemy's rear, the platoon must have the capability of digging in with all due speed. Admittedly, the limited depression of the tube places the vehicle at a slight disadvantage in choosing a position. The best placement would be on a gentle forward slope, althougn careful observation will produce many other satisfactory positions.

The assault gun, despite its poor reputation acquired in the past through misinterpretation of performance and frequently through misuse, would be a valuable addition to the mechanized infantry. It could be produced at a relatively low unit cost and with supply economy by basing the automotive systems on the future MICV and removing many inessential frills which seem to burden our antitank systems.

Despite the lessons learned in the Russian campaigns of 1941–1945, and the lip service we so blithely pay to the "Guderian Doctrine," we doggedly continue to waste our limited tank resources on missions which could be performed by a simple, specialized vehicle in rather low density. The assault gun concept was proven and abandoned. It deserves another chance.

CAPTAIN TIMOTHY R. O'NEILL, commissioned from The Citadel in 1965, has commanded Troop L, 6th Armored Cavalry Regiment and Company C, 1st Battalion, 77th Armor. Captain O'Neill, who graduated from the Armor Officer Advanced Course in 1969, is currently assigned as a project officer at the US Army Armor and Engineer Board at Fort Knox.

CAPTAIN ALFRED T. BOWEN JR., commissioned in 1966 from Tulane University, has served as a troop commander in the 4th Squadron, 12th Cavalry. While in Vietnam in 1970, he served as S4 of the 2d Squadron, 11th Cavalry and tank company commander with the 1st Brigade, 5th Infantry Division (Mech). Captain Bowen is now attending the Armor Officer Advanced Course at Fort Knox.

Reforger III

MORE than 11,000 US-based soldiers were flown by Air Force planes to Rhein Main, Ramstein and Echterdingen airfields in West Germany to participate in the third annual air-lift exercise, Reforger III.

Reforger III is an exercise designed to meet commitments made to the North Atlantic Treaty Organization (NATO) and those made in the 1967 Trilateral Agreement between the United States, the United Kingdom and West Germany.

The primary participant in the exercise, the 1st Infantry Division (Mech), is a dual-based organization with two brigades based at Fort Riley, Kansas, and its 3d Brigade permanently stationed at Augsburg, Germany. The brigades were brought together for the exercise. Other US-based support units also joined in the exercise.

Major General Edward M. Flanagan Jr., commanding general of the 1st Infantry Division (Mech) and Fort Riley, led the command element and colors off the plane in Germany on September 27 to officially begin the exercise.

The focus of the exercise was on testing procedures and techniques for receiving, equipping, assembling and deploying Army units once they have arrived in West Germany, rather than on the rapid air transport of troops from the US.

During Phase I, the redeployed units moved their combat gear and equipment by road and rail from prepositioned storage sites in Germany to the field maneuver area which extended from Munich to an area north of Nuremberg.

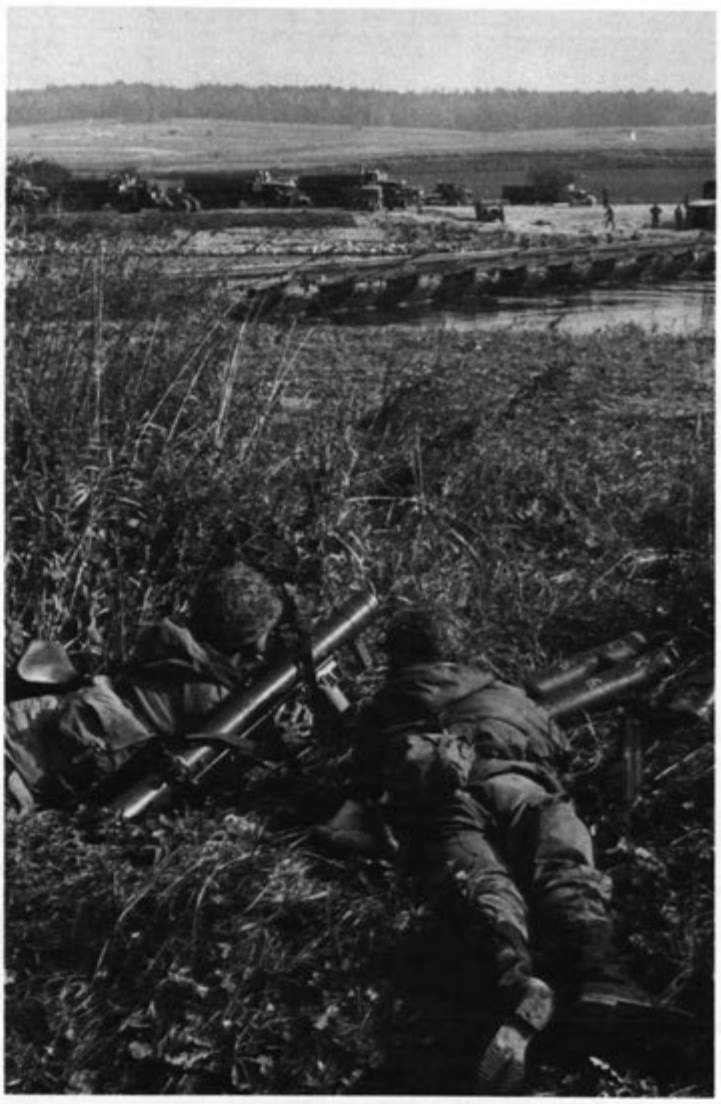
"Certain Forge," the first exercise in Phase II of Reforger III, began with an aerial assault and armored linkup that combined the concept of air-mobile operations with traditional land maneuvers. The five-day operation saw the friendly "blue" forces cross the Amper River and drive the aggressor "orange" force back.

The friendly forces made up of the 1st Infantry Division (Mech) and Canadian 4th Mechanized Battle Group were pitted against elements of the US 1st Armored Division and the German 35th Panzer Grenadier Brigade, acting as the aggressor forces.

The Reforger III units test fired their artillery and main battle tanks at the US Army Training Area in Grafenwoehr during Phase III. The successful NATO operation was completed on November 16 when the units turned in their equipment and redeployed to their bases.

Fulfills NATO Pledge

Reforger



III

Rx the insurgent: Locate, isolate, eradicate

PART 2

by Lieutenant Colonel John C. Gazlay

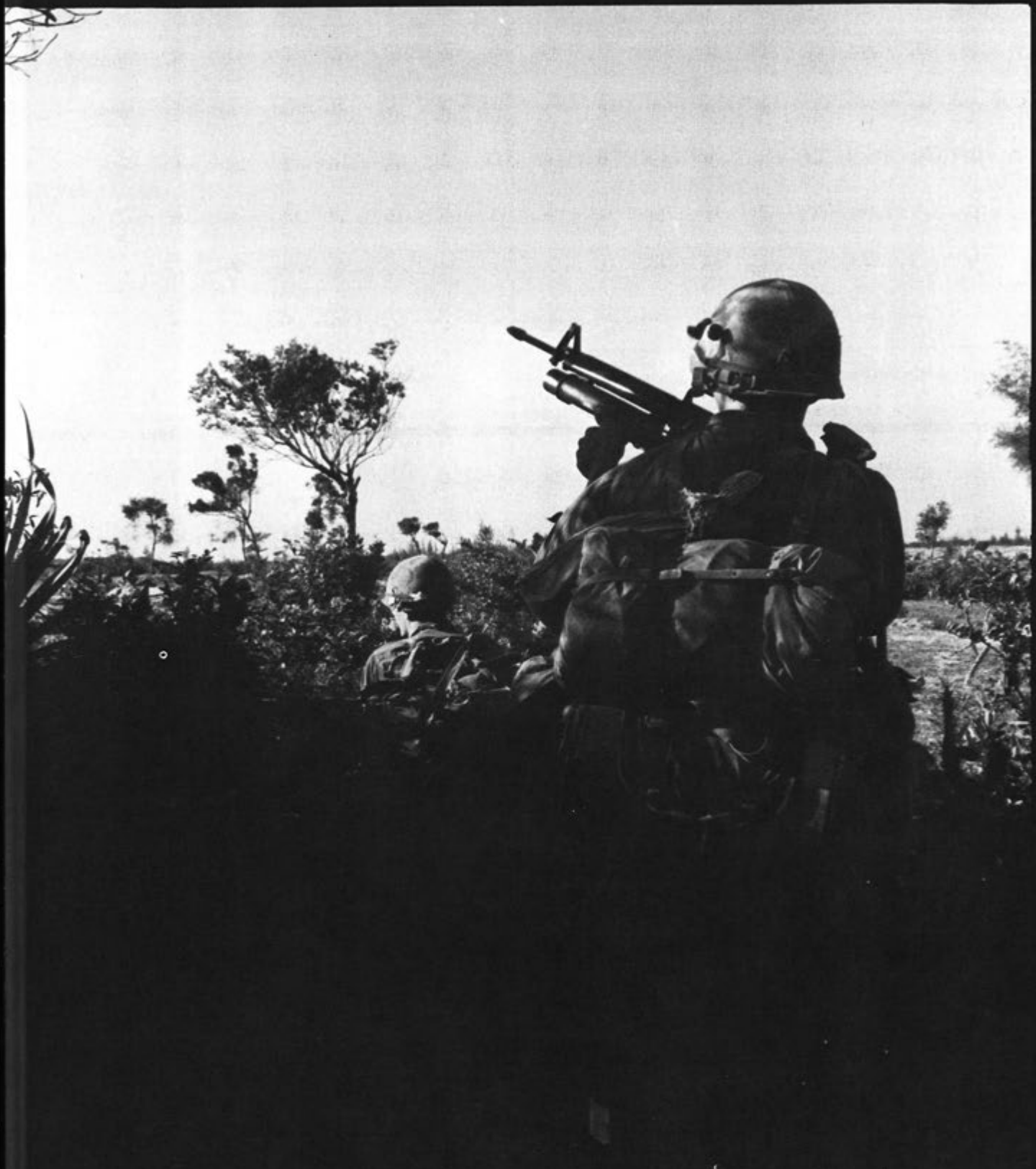
INTELLIGENCE RECORDING AND DOCUMENTATION

Prior to discussing the specifics of information processing, certain basic premises must be accepted in handling insurgent information to produce complete, useful combat intelligence. The most important premise is that mental processing is not sufficient. Written processing is necessary to retain and comprehend the minutia gathered and processed daily. Secondly, the area of operations is not linear, but completely surrounds the counterinsurgent. There are no front lines and incidents occur throughout the entire area. Another premise is that of tempo. In a conventional situation, information a few hours or a few days old is considered to be of little value. In stability operations a report five days old quite often is deemed current, and incidents may remain posted on the situation map from 30-45 days.

A sometimes frustrating fact of life is that many of the sources of information are civilians who are not trained military observers. These sources might reply to the question, "How many?", with "As many as there are leaves on a baobob tree."

A great difference from conventional operations is in posting the situation map. The conventional situation map would usually find 30-40 incidents recorded, all of which are generally catalogued in the mind. The stability operations situation map will record several hundred incidents for a division, and possibly in excess of 1000 for a corps, which requires augmenting the map with a reference file. This map clutter occurs because the two echelon rule (posting enemy units two echelons above and below) does not apply. A division may take note of a single sniper, and a corps could be interested in the activities of an insurgent terror squad.

The final premise is the complexity of maintaining order of battle information. The insurgent military organization generally can be categorized as main force, provincial, district, self defense, and part-time guerilla units. Main force units normally have a TOE and are relatively standard. The remaining



categories have a wide variety of names, designations, numbers, and codes. Most units will have at least three titles—the name of the leader, the political unit represented, and a code name or number.

The aforementioned variants support the initial premise that stability operations intelligence personnel must establish and maintain comprehensive files because memory processing cannot produce the desired intelligence.

Records and record maintenance

Correct classification and definition of terms are the keys to keeping good records. A word must convey the same meaning to all persons.

PRIMARY RECORDS CLASSIFICATIONS

Classification	*Definition*
Engagements	Incidents involving military personnel
Terrorism	Incidents involving civilians
Sabotage	Incidents involving objects
Propaganda	Activities to influence people
Sightings	Reports of location and movement of insurgents
Miscellaneous	Information of intelligence interest
Order of the battle (OB)	Technical OB data, codes, names, identifications

Any incident or activity can be classified into one of these categories, except incidents of terrorism where propaganda is presented. In this case, terrorism preempts propaganda. When posting these incidents on the situation map, assign a grease pencil color classification as follows: engagements (brown), terrorism (purple), sabotage (green), propaganda (blue), sightings (black), and miscellaneous (yellow). This color code reserves the colors red (main force) and orange (other enemy forces) for OB posting. Each annotation on the map is supported by a card filed according to the appropriate category.

Information file

The primary classifications are further broken down into secondary classifications which provide the basis for the information file. The information file is an alphabetical list of incidents maintained for current and future analysis, and collation of insurgent activity. An information file should contain the following partial list of topics:

INFORMATION FILE TOPICS

Antiaircraft	Ground fire at aircraft—type, date, time and coordinates.
Ambushes	Record of place and type (civilian, vehicular, foot patrol, etc.)
Caches	Record of tunnels, caves and other clandestine storage areas used by insurgents. Target information.
Harassing fire	Sniping, minor ambushes, random firing at outposts and installations, firing at convoys, etc.
Recoiless rifles	Record of rifles in hands of insurgents. Cross references under ammunition, heavy weapons and artillery.
Traps	Record of booby traps, spike pits, spear traps and similar devices.
Weapons taken by insurgent	Record of weapons falling into insurgent hands.

The maintenance of this file permits the intelligence officer to extract all information relative to a specific category simply by the removal of, or reference to, an alphabetical topic. An example of the use of this file would be that an inquiry requesting information about insurgent actions directed against airfields could be answered by withdrawing one set of cards. Also, this file is extremely helpful in the preparation of statistical reports.[14]

Incident cards

Incident cards are standard 5x8 cards or paper, the latter requiring less filing space. The source for card entries is the intelligence summary (INTSUM). (See FM 30-5 for format.) Included are the local INTSUM and INTSUM's from higher, lower, and adjacent headquarters. Each incident or paragraph

from the INTSUM is typed on a card, or if multiple copies of the INTSUM are provided, cut out and pasted on the cards, using selected information. Corrections or additions to INTSUM items are made on the original, resulting in consolidation. Each item should have a date, the geographical coordinates, INTSUM number, and issuing headquarters. Cards are filed in chronological order. A cross referencing code containing the following information appears at the top of each card:

Geographical code - - - - Upper left corner
Primary classification - - - Left center
Secondary classification - Right center
Strength code - - - - - - - Right corner

An incident file arranged in the above manner permits the intelligence officer to isolate insurgent activities by specific date, geographical area, and type of incident.

Coding incident cards

Geographical code—Consists of two letters and two numerals, e.g., coordinates NM393 757 would be NM37. This code has four purposes: it is a useful symbol; permits locating incidents by designated blocks; reduces the amount of writing during processing; and reduces clerical errors made while copying six digit coordinates. This technique permits a rapid answer to questions requesting types of insurgent activity in a specific area.

Primary classification—Used for statistical

reports. Indicates the previously described color code designator to be used in map posting.

Secondary classification—Used as the key for categorizing the information to be transferred to the information cards previously discussed.

Strength code—Consists of words or figures indicating enemy strength. The word picture uses descriptive terms such as company, platoon, team, etc.

Incident file

Once prepared, the incident cards constitute both divisions of the incident file. The divisions are the current file arranged in chronological order, and the non-current file which utilizes geographic code for sequencing.

Current file

Incident cards are current as long as the item is posted on the situation map. This file is located near the map to provide an immediate source of reference. The file is divided into two parts: "current month" with tabs 1-31, and "past month" with similarly numbered tabs. Normally after 60 days have elapsed, the item is erased from the map and the card is retired to the non-current file.

Non-current file

This is a permanent filing place for incident cards. In permanent filing, it is desirable to file cards by geographical location since the most probable use of this file will be area studies. A new file is started each month, permitting area studies for any desired period of time by combining the desired months. It might be assumed that the incident file will be bulky; this is not so. At corps level (1000 cards monthly), the cards will occupy a space of 8in by 5in by 8in. Division level and lower will be proportionately less.

Situation and incident map

The situation and incident map is a common map with a superimposed acetate drop which depicts order of battle. The incidents are posted using the previously discussed color code. Color coding utilizes a ⅜in circle of the selected color, followed by a date, and a strength symbol, usually "B" for battalion, "C" for company, "P" for platoon, etc. A platoon conducting propaganda on 13 May would be depicted by a blue circle with P/13-5 under the circle. Order of battle information is posted using conventional symbols with the color red for main force units, and orange for other enemy units. This manner of recording integrates two significant records to assist in analyzing trends and indications.[15]

Order of battle (OB) records

This file lists units both numerically and alphabetically. The cards contain technical information (when known) relevant to insurgent units such as name(s), code number, strength, number and type weapons, type unit (infantry, antiair, QM, etc.), leader(s), operational area(s), normal employment (ambush, safe haven security, antiair, etc.), higher headquarters, subordinate units, etc.

Up-to-date, detailed information must be kept on all military and civilian insurgents.

Personality file

These cards are maintained on both military and civil insurgents. The cards list (when known) name(s), alias(es), date and place of birth, civil and military education, decorations and awards, campaigns, present assignment, and physical peculiarities (missing digits, scars, tatoos, etc.). Two notes of explanation:

- The place of birth is extremely important because your opponent may be fighting in the locale in which he was born and reared. With this background he has an intimate knowledge of the physical, climatic, political, economic and social background. The insurgent fortified with this knowledge can be a more formidable foe than insurgents recently introduced to the area.
- The term "civil insurgent" applies to persons

who maintain an established residence and business, and who provide covert medical care, foodstuffs, materiel, and information.

Movement and sighting (M&S) file

Most reports of insurgent unit activities indicate date, time, coordinates, how many, what doing, how equipped, but lack identification. The movement and sighting file may assist in identification, and permits monitoring insurgent activities in any selected area. The friendly tactical area of responsibility (TAOR) is divided by any convenient manner, e.g., grid squares, military boundaries, or political boundaries. Political boundaries are stable and normally coincide with TAOR boundaries.

The following illustrates the use of this method. The area is divided into districts and a card indexed for each. Within each of these subdivisions, indices for squad (XYZ dist), platoon (XYZ dist), company (XYZ dist), battalion (XYZ dist), regiment (XYZ dist) are inserted. All incidents involving insurgents are posted on the appropriate unit card in the district of occurrence. An example of this type posting would be:

NM74	8 Mar	100 man amb B/1-19 Cav convoy w/MG & RR
NM69	9 Mar	90 man atk outpost w/mortars, RR & flame-throwers
NM61	9 Mar	100 man atk police hqs w/MG & RR, Luang-Kia (prob C-53 CO)

Confirmed unit file

This file consists of cards titled with the name of each confirmed unit. The present or last known location of this unit is entered in pencil. All activities attributed to an identifiable unit are posted on the appropriate card. Periodically, these cards are cross-checked against the OB file as a basis for keeping OB cards current. The cards are filed numerically or alphabetically, with appropriate index tabs to facilitate entry into the file.

Daily processing routine

The following daily routine will facilitate the efficient and most productive use of intelligence records.

- Type or paste up incident cards from local INTSUM, coding them with geographical code and primary classification.
- Sort the cards according to geographical code and post the situation map.
- Code incident cards with the secondary classification and strength code, and post to the OB file, M&S file, personality file, or other appropriate files. Initial the card to indicate posting is complete.
- Sort out posted incident cards by date and file in the current file.
- Repeat the preceding steps for selected incidents from higher, lower, adjacent unit INTSUM's and other current intelligence documents.
- Post pertinent information from OB summaries, interrogation reports, document reports, agent reports, and other applicable current sources to the appropriate cards.[16]

This method might lead the reader to believe that the system is lengthy and cumbersome. Admittedly, the initial institution of this system will take time, but operational time is saved by this process, and the distinct divisions of the system convert the jumble of incidents and reports into useable intelligence, facilitates reporting, and the preparation of studies. In the daily routine, approximately three minutes are consumed in preparing each new incident card and in map posting. Another three minutes elapse as each card is processed through the other applicable files. At corps level (30-40 incident cards daily), three to four hours are required for processing. This leaves the remainder of the day for the administration of other input and the preparation of reports. The time at each lower level diminishes proportionately.

The system is easy to learn, and replacement personnel, or personnel from headquarters desiring to institute this method, can effectively operate the

Reports of insurgent activities must be recorded effectively and efficiently to be of value to the intelligence officer.

system with approximately two days devoted to on-the-job training. This system is readily adaptable to automatic data processing at any echelon possessing such equipment.

INFORMATION EXCHANGE

For intelligence to remain viable, each intelligence officer must remember that he is a member of an intelligence community. The key to community existence is information exchange—up, down, and laterally. By exchanging pieces of a complex jigsaw puzzle, the pieces may be refitted until a picture develops.

CAUSES FOR POOR INTELLIGENCE

The most common causes for failure are:

- Unsystematic and inefficient collection of information.
- Defective interrogation.
- Poor evaluation of information taken from interrogation and documents.
- Defective system of disseminating intelligence.
- Too much emphasis on pre-operations intelligence activity; little or no post operations intelligence analysis and the resulting loss of intelligence continuity.[17]

SUMMARY

From this investigation of the subject, it can be seen that the basic principles of intelligence as stated in FM 30-5 remain unchanged. The variations from conventional doctrine are those of technique and emphasis. Intelligence operations in stability operations require improvisation, minute attention to detail, and emphasis upon the importance of exchange.

Author's note:

The methodology advanced in this article is based on my own experience. It has been devised to complement existing current doctrinal publications. The various topical processes and methods discussed have been tested in both an academic atmosphere and under combat conditions. I hope that the points I have covered might be useful to other US Army officers and agencies who are currently working to develop and improve our intelligence doctrine and techniques needed for the support of stability operations.

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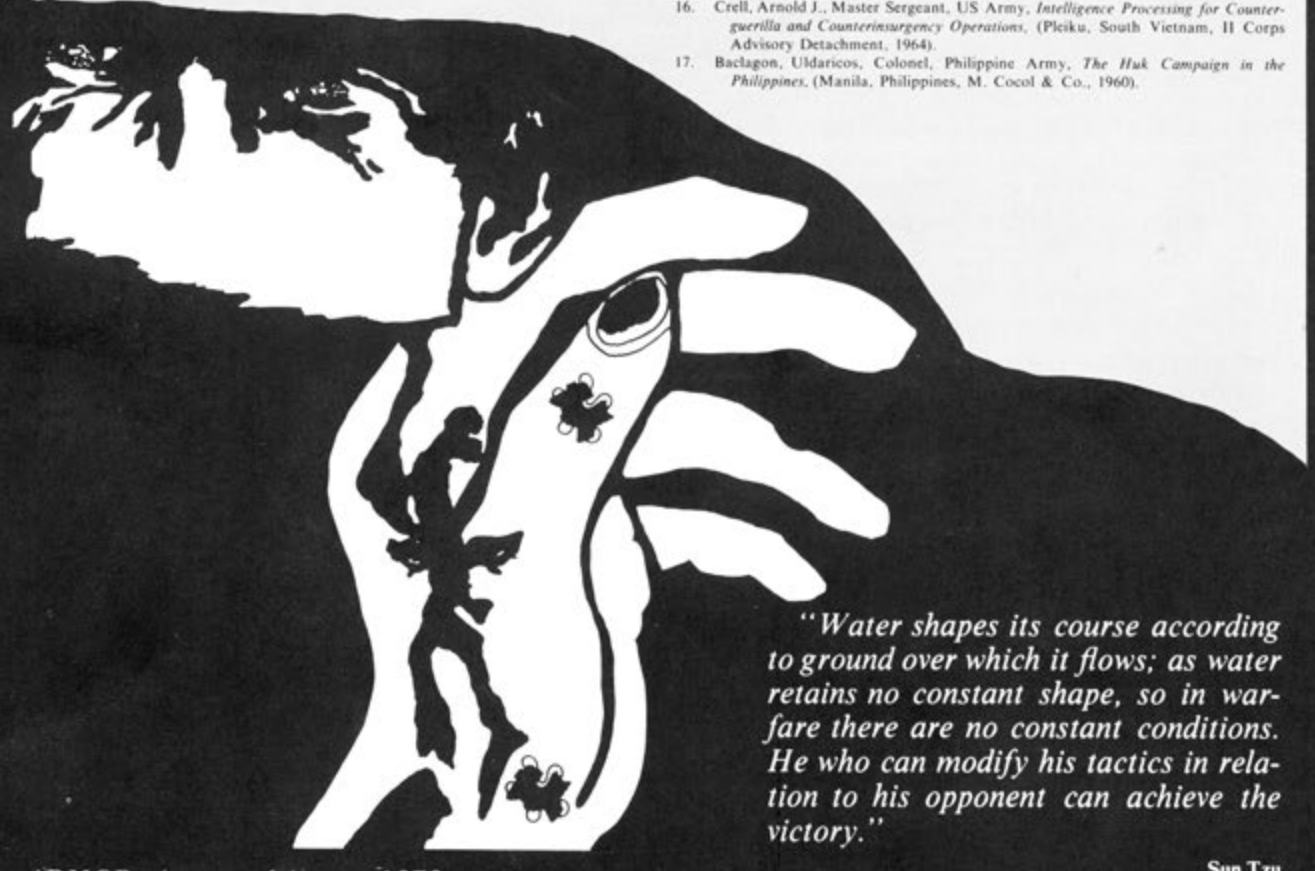


"Water shapes its course according to ground over which it flows; as water retains no constant shape, so in warfare there are no constant conditions. He who can modify his tactics in relation to his opponent can achieve the victory."

Sun Tzu

The fascination which armor holds for thousands of people throughout the world has greatly increased the demand for well-written and well-illustrated books. Here is an overview of what has been published since World War II in this unique field of writing.

by Colonel Robert J. Icks, USAR-Retired

Part I

Books about Armor

THE September 1929 issue of *The Royal Tank Corps Journal* carried, under my name, a compilation of the then available books on armor. Shortly thereafter, the *Infantry Journal* in this country published my one-line appraisal of each of these books. I was also quoted on the subject of tank literature in the "Ask Adventure" section of the old pulp classic *Adventure Magazine*.

Seeing one's name in print was a tonic. More and more of my pieces appeared in the two magazines first named and in *Ordance*, with reviews and sometimes translations appearing in the military press of several European countries. This encouraged the production of a book manuscript which led to joining forces with Major Ralph E. Jones and Captain George H. Rarey, US Army, in the 1933 publication of *The Fighting Tanks Since 1916*. This was the first comprehensive and well-illustrated book on armor to be published in the United States.

Although many kind things were said about this book, those were Depression days and it could hardly be called a best seller. Still, it led to me being invited to participate, with O. H. Hacker, an Austrian engineer, Otto Merker, a German engineer working in Sweden, and G. P. von Zezschwitz, a young German Wehrmacht officer, in the continuation of Heigl's *Taschenbuch der Tanks*, the outstanding book series which first appeared in Germany in

1926 but which had ended after the 1930 edition with the death of the author, Major Fritz Heigl, a retired Austrian Army officer. Von Zezschwitz also produced the third volume of the 1935 three-volume set, which covered tank combat actions and antitank methods.

There were, of course, many authors of far greater renown writing on the subject of armor during this period. Some wrote only for periodicals but among those who wrote hard-cover books were such people as Fuller, Liddell Hart, Martel, Swinton, Rowan-Robinson, Germains, Deygas, De Gaulle, Volckheim, Nehring, Guderian, von Eimannsberger, Zyrkiewicz and, in the United States, Kutz and later, S. L. A. Marshall.

Another book manuscript of mine was finished just before the United States entered World War II, but the publisher, for various reasons, made no attempt to publish it for several years. However, I was permitted to keep it up-to-date within the limits of security, and *Tanks and Armored Vehicles* appeared just before VE-Day in 1945.

Because of this background and a continuing interest in armor, it occurred to me to offer an appraisal of the books dealing with armor which have been published since World War II and which have come to my attention. Most of the earlier writers are gone but a new group has appeared which is no less enthusiastic, although not all of them possess adequate qualifications as historians or as technicians.

The usual number of biographical and other books appeared after World War II, aimed at both the military and the civilian markets. About 10 years ago, an additional market appeared, and since then, there has been a veritable flood of books. This market is made up of hobbyists who have branched out from the fields of model aircraft, cars and railroads to that of armored vehicles. Associations of these hobbyists have been formed in several countries with memberships numbering into the thousands. Some of these publish their own small periodicals. A few individuals make "scratch" models but many others created a demand for commercial models and kits, a demand met by several firms in Europe, Japan and the United States. Commercial model magazines, once devoted almost entirely to aircraft, now cover armored vehicles as well. Newly-established periodicals devoted to military weapons, including armor, are published regularly in several countries.

Because of the continuing demand for more and more books, especially those with illustrations, specialists have developed whose writings range from excellent to poor. This is unfortunate for the serious writers because the market is being saturated with a good deal of unseasoned and even inaccurate writing. The only thing that can be said in their favor is that they meet a demand by the younger buyer having limited funds.

The well-done books are expensive, costing up to 25 dollars. Publication costs for a well-illustrated book are high, but for the armor enthusiast, a book which contains illustrations and data is fairly certain of purchase. Unfortunately, there is considerable duplication of photos, many of the same ones appearing over and over again as one author copies from another. Therefore, books with new photos are in considerable demand, especially when printed on slick paper.

Among the books covering personal reminiscences are those of such pioneers as Sir Ernest D. Swinton with *Over My Shoulder* (Hodder and Stoughton 1951), Sir Tennyson d'Eyncourt's *A Shipbuilder's Yarn* (Hutchinson 1960) and *An Outspoken Soldier* (Sifton Praed 1949) by Major General Sir Giffard Le Q. Martel. The last was a sequel to the same author's *Our Armoured Forces* (Faber and Faber 1946). None of these does more than scratch the surface. Sir Basil Liddell Hart's *The Tank* in two volumes (Cassell 1959) is the official history of the Royal Tank Regiment, but it still leaves an incomplete history of armor in England because the Royal Tank Regiment is but a part of the Royal Armoured Corps, making it necessary to augment the RTR history with the many individual unit histories which have been published.

Liddell Hart's *Memoirs 1895-1938* and *The Later Years* (Cassell 1965 and Putnam 1966) contain much background material for the serious student of armor development in England. His histories of World Wars I and II (Cassell in England, Putnam in the USA), the latter published posthumously, contain much of interest to the armor enthusiast.

Other English books dealing in whole or in part with armor are *Normandy to the Baltic* by Viscount Montgomery (also published in the US in 1948 by

Houghton Mifflin), *The War in the Far East* by Basil Collier (Heinemann 1969, Morrow 1970) and *Struggle for Europe* by Chester Wilmot (Collins 1952). *Armoured Crusader: Major General Sir Percy Hobart* by Major Kenneth Macksey (Hutchinson 1967) adds considerably in the way of background for the distinctive unit history *The Story of 79th Armoured Division—October 1942-June 1945*. The latter was privately published in Holland just after World War II and details the accomplishments of the British "funnies" or specialized armor.

One of the best known and perhaps the best qualified of the new crop of writers is R. M. Ogorkiewicz, who needs no introduction to readers of *ARMOR*. He is the author of *Armour* (Stevens 1960), which was reprinted in 1970 by Arms and Armour Press under the title *Armoured Forces*, and of *Design and Development of Fighting Vehicles* (Macdonald 1968 and Doubleday 1969). Both are well-written books covering the broad historical, organizational and technical facets of the subject.

Major Macksey and others also contributed to the Ballantine series of paperbacks on World War II, some of which covered armor operations. These vary in quality and accuracy and the illustrations show up badly on the poor grade of offset paper used. *Machine Age Armies* by John Wheldon (Abelard-Schuman 1968) is a thought-provoking book on the philosophy of war and the relationship of armor to it. Another recent book *The Tank* by Douglas Orgill (Heinemann 1970), takes the interesting position that armor died at Kursk and was buried in the Falaise Pocket, today being of value only for crowd control. *Tanks in Battle* by Colonel H.C.B. Rogers (Sealey Service 1965) is a loose account of a few combat actions but, on the whole, is a disappointment, especially since it lacks maps. A new book by Major Macksey and John H. Batchelor entitled simply *Tank* (Macdonald 1970) has excellent text but the many illustrations are drawings rather than photographs and too often are spread across the center fold.

The official World War II histories should not be overlooked. The British war histories published by Her Majesty's Stationery Office are excellent, including those on the technical side, although the latter lack illustrations. These include *British War Production* by M.M. Postan, *Design and Development of Weapons* by M.M. Postan, D. Hay and J.D. Scott, and *North American Supply* by H. Duncan Hall. Many British firms which engaged in war production during World War II also produced books of considerable historical value.

Not many books other than the official Canadian war histories have been published in Canada, but two of them contain material of interest. These are *Canada's Soldiers 1604-1954* by George F.G. Stanley and Harold M. Jackson (Macmillan of Canada 1954) and *Worthy* by Larry Worthington, the biography of Major General Worthington, father of the Canadian Armoured Force. Both are worthwhile.

Tanks in the East by Colin Kerr (Oxford 1945) is a small Australian book which adds a little color to the story of desert fighting. The official Australian histories probably add a great deal more, but I have not seen either these or the official New Zealand histories. *Springboks in Armour* by Harry Klein (Macdonald 1955) is the story of armor in the Union of South Africa, dealing mainly with armored cars.

Several worthwhile books on armor have been published in France but they are not illustrated. Among them are *Le Defaut de l'Armure* by Colonel Georges Ferre (Charles-Lavauzelle 1948) and *L'Armement de la France 1936-1939* by Robert Jacomet, controller general of the Army (Lajeunisse 1945). *L'Arme Blindée dans la Guerre* by General J. Boucher (Payot 1953) gives good summaries of armor combat in World War II and includes adequate sketch maps. The voluminous *La Guerre des Blindées* (Payot 1947) by Swiss Major Eddy Bauer has many sketch maps. However, the book was hastily written before adequate details were available and it was printed on a very poor grade of paper. It is hoped that the later edition which has appeared has corrected these faults.

There is a fascinating book describing the far-flung assembly line for building armored cars under the noses of the German occupying forces in France. It was written by one of the organizers, Joseph Restany, the code name for J.J. Ramon, a French armament engineer. The illustrations add to the story entitled *Une Entreprise Clandestine sous l'Occupation Allemande* (Charles-Lavauzelle 1948). The most completely illustrated book on the development of French armor is *Histoire de l'Armée Motorisée* by André Duvignac (Imprimérie

Nationale 1947). A very good and well-illustrated booklet titled *Armée Blindée Cavalerie de 1916 à Nos Jours*, which was published in 1970 as No. 9 of the *Historama Series* (Editions Chaix-Desfosses-Neogravure), gives a great deal of detailed information about French armor organization since 1916 together with summaries of combat actions.

The Battle of France is very well described in *To Lose a Battle: France 1940* by Alistair Cooke (Little Brown 1969). This work covers the use of armor on both sides, as well as the general course of events in the context of the political situation of the period.

In the United States and dealing with armor closer to home, *Forging the Thunderbolt* by Mildred Hanson Gillie (Military Service 1947) remains the only published effort thus far to cover the development of the US Armored Force. However, it has many shortcomings, not the least of which is its complete lack of illustrations. *Tank* by Arch Whitehouse (Doubleday 1960) was written for popular appeal and lacks balance but it comes close to capturing the "feel" of tank warfare. So do Cornelius Ryan's *The Longest Day* (Simon and Schuster 1959), which describes the D-Day landings, and *Kasserine Pass* by Martin Blumenson (Houghton Mifflin Company 1966).

The U.S. Marines and Amphibious War by Jeter A. Isely and Philip A. Crowl (Princeton 1951) is the classic on the subject and gives excellent overall coverage of the development of the LVT, as well as of the use of armor in the context of the advance across the Pacific so far as the Marine Corps is concerned. The separate combat monographs published by the Marine Corps Historical Section also are invaluable. The *U.S. Army in World War II Series* published by the Chief of Military History contains several volumes which include the use of armor in combat in the various theaters. Other volumes include: *The Chemical Warfare Service: From Laboratory to Field* by Leo Brophy, Wyndom D. Miles and R.C. Cochrane (1955); and three volumes on the Ordnance Department—*Planning Munitions for War* by Constance Mc Laughlin Green, Harry C. Thomson and Peter C. Roots (1955); *Procurement and Supply* by Harry C. Thomson and Lida Mayo; and *On Beachhead and Battlefront* by Lida Mayo (1968).

The *Army Lineage Series: Part I Armor-Cavalry* by Mary Lee Stubbs and Stanley Russell Connor, published in 1969, is worthy of space on anyone's bookshelf.

A useful civilian book about the production of munitions is *Arsenal of Democracy* by Donald M. Wilson (Harcourt Brace 1946).

Italian vehicle development is covered in the very large and fine *Storia della Motorizazzione Militare Italiani* by General Angelo Pugnano (Stabilamento Poligrafico Roggero e Tortia 1951). The best known Polish book which covers armor in all countries is the well-illustrated *Wozy Bojowe* by Janusz Magnuski, which first appeared in 1960 as a publication of the War Ministry but was sold commercially. It was revised and published in somewhat different format in 1964. The text is good and sufficiently complete as to mention several US experimental postwar vehicles not generally known even in the US.

Other than translations of Soviet books, the best Czech book to come to my attention is *Umlcêné Zbrané*, published in Prague in 1966. Although it covers the development of the entire Czech arms industry, the section on Czech armor is good and contains many illustrations. The book was authored by a team of writers, the section on armor being written by Major Ota Holub. It suffers only from poor paper quality.

For one reason or another, German vehicle models, data and combat history have been the best sellers to those interested in armored warfare. In December 1970, the first of the 1935 *Heigl's Taschenbuch der Tanks* series was reprinted by the original publisher (Lehmanns Verlag) with others in the series due to be reprinted in the future.

The original series was continued by the publisher after World War II as *Taschenbuch der Panzer*. This excellent series now is authored by General Dr. F.M. von Senger und Etterlin. Unfortunately, the earlier books in the postwar series contained many technical and historical inaccuracies, and many of the illustrations were poorly retouched, changing the appearance of the vehicles pictured. In addition to this series, General von Senger has produced *Die Deutschen Panzer 1926-1945* and *Kampfpanzer 1916-1966*, all published by Lehmanns Verlag. *Taschenbuch der Panzer 1960* was translated and edited by R. M. Ogorkiewicz and published in England as *The World's Armoured Fighting Vehicles* (Mac-

donald). Companion volumes published by Lehmanns were *Die Deutschen Geschütze, 1939-1945* and *Die Panzergrenadiere*. General Senger also wrote *Panzer* (Athaneum 1958).

Other illustrated German books are: *Die Deutsche Panzertruppe, 1939-1945* by H. Scheibert and C. Wagener (Podzun Verlag 1966); *Sturmartillerie* by G. Tornau and F. Kurowski (Maximilian Verlag 1965); and *Panzer Gestern und Heute* by Klaus Neuman and Ulfred Roggenbau, privately published by C.H. von Lucke in 1969. All the authors are Bundeswehr officers. These books seem intended for the popular market. A German book with line drawings and covering the technical and mechanical side of vehicles is *Technische Lehrbuch über Kettenfahrzeuge und Kettenfahrschule* by Ulrich Wacker (E.S. Mittler 1959).

A recent book is *Kraftfahrzeuge und Panzer der Reichswehr, Wehrmacht und Bundeswehr* by Werner Oswald (Motorbuch Verlage 1970) covering all types of German vehicles since 1900. A small but authoritative book on the history of German armor, containing only a few sketch maps, is *Die Geschichte der Deutsche Panzerwaffe 1916 bis 1945* (Propylaen 1966) by General Walther Nehring, one of the German pioneers.

Mr. W.J. Spielberger, a Volkswagen engineer stationed in the US and a protegé of Dr. Porsche, collaborated with General von Senger in the later editions of *Taschenbuch der Panzer*, and also with Dr. Friedrich Wiener, editor of *Truppendienst* in Austria, in producing the poorly printed but definitive volume with line drawings covering the technical details of *Panzerkampwagen III und IV* (Lehmanns Verlag). Mr. Spielberger is perhaps the most thorough researcher writing about German armor today, while Dr. Wiener himself is the author of paperbacks published by Carl Ueberreiter covering all phases of armament in the NATO and Warsaw Pact countries, and the countries outside these organizations. These are printed on good quality paper and contain many pictures, although they are small. Dr. Wiener also produced, with Herbert Hahn, the looseleaf *Panzerkennblätter Serie I-IX* between 1958 and 1965, illustrated with line drawings.

Some of the other German books have been translated and published in England. Among these is *Panzerfuehrer* by General Heinz Guderian, another German pioneer. It appeared as *Panzer Leader* (Michael Joseph 1952). Of interest to anyone studying the desert campaigns in World War II is *The Rommel Papers* (Collins 1953, Harcourt, Brace and World 1953), which was edited by Liddel Hart, as are *With Rommel in the Desert* by H.W. Schmidt (Harrup 1951) and *Panzer Battles 1939-1945* (Cassell 1955, Oklahoma 1956) by Major General F.W. von Mellenthin. This book also covers some of the operations on the Eastern Front. *The Desert Rats* by Major General G.L. Verney (Hutchins 1954) and Major General Sir Francis Guingand's *Operation Victory* (Scribner 1947) from the British side are of value also.

Most of the books published in East Germany are releases of the War Ministry in East Berlin and most are translations of Russian books. They include *Panzer im Gefecht* by N. Korolkow (1962) and *Der Panzer* by A.S. Antonov, B.H. Artanomov, B.M. Korobkov and E.I. Magidovitch. All contain some illustrations but the last named is full of spendid art and detailed instructive text on Russian vehicles and their construction. Like some of the Soviet books on tank gunnery, also published in East Germany, *Der Panzer* is extremely thorough, corresponding to our TMs but broader in nature. This book has been translated and published in all the satellite countries.

Panzer Gestern und Heute by Colonel W.D. Mostovenko is another East German translation. It is satisfactorily illustrated. But the most unusual book, having no counterpart anywhere, is one written by several East Germany army officers in 1967 and called *Kleine Panzerkunde*. It is interestingly illustrated with schematics and photos explaining in simple language all phases of tank construction. It seems to have been intended as a handbook for young cadets or for pre-induction training.

Walter Speilberger, who has been mentioned earlier, has participated in a series of paperback volumes *(Aero Armor Series)* covering all the World War II types of German wheeled, halftracked and tracked vehicles. The first of these was written by H.J. Nowarra, Uwe Feist and E.F. Maloney. The balance are by Mr. Spielberger and are illustrated in part with color paintings by Mr. Feist. Although the photo coverage is excellent, definition was lost in the offset printing process used. This author also

collaborated with Mr. Feist in producing several good paperback volumes on slick paper, each book covering a separate German vehicle with its variations. Mr. Feist now produces similar picture books on German armor from his home in Canada.

Arco Publishing in the US has published some small paperback histories including *German Tanks 1914-1968* by H.J. Nowarra and *50 Famous Tanks* by George Bradford, secretary of the Canadian AFV Association, one of the organized groups of armor enthusiasts. In 1952, Coward-McCann published a good hard-cover illustrated boys' book titled *Military Vehicles* by C.B. Colby.

German halftrack vehicles are covered in a well-illustrated book published in England by Warne and titled *Half Tracks*. This was written by B.H. Vanderveen. Mr. Vanderveen, an automotive expert, also has written *The Jeep* (Warne 1970), which includes armored versions of that vehicle, and *The Observer's Fighting Vehicle Directory*. The latter concerns itself mainly with soft skin military vehicles, although some armored vehicles are included.

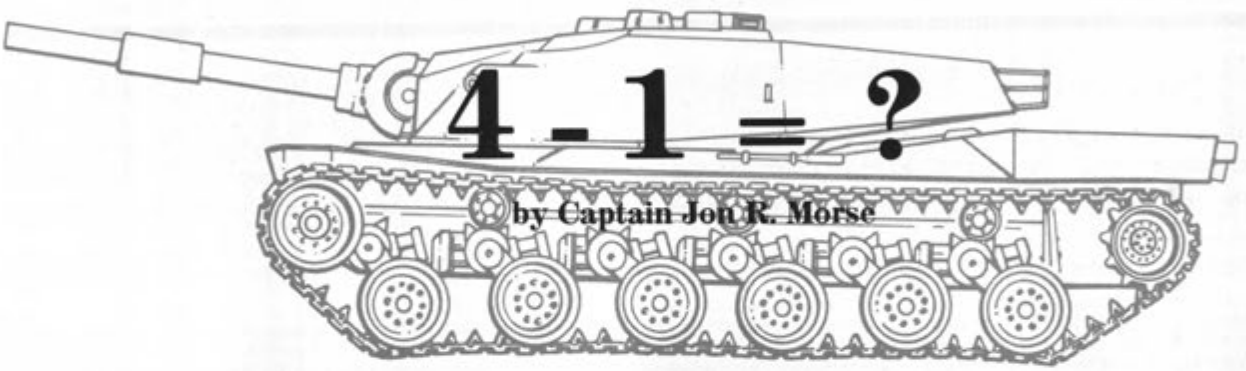
German vehicles, as well as those of other countries, are covered in the very good and reasonably priced booklets called *The Tank Museum Guide* produced by the Royal Armoured Corps Tank Museum at Bovington. These go far beyond the actual contents of the museum and have undergone several revisions by successive curators. When it is realized that the museum draws over 300,000 visitors annually, it can be seen that the great interest in the subject has justified the continued updating of this series.

The concluding portion of "Books about Armor" will be published in the March-April issue.

COLONEL ROBERT J. ICKS, USAR-Retired, a lifelong student of and writer on armor, has authored five books and numerous articles for professional journals. Having served as an enlisted man in World War I, he was commissioned in the Infantry Reserve upon graduating from Ripon College in 1927. During World War II, he served as a colonel with the Ordnance Department.

short, over, lost, or ... TARGET

This department is a range for firing novel ideas which the readers of ARMOR *can sense and adjust. It seeks new and untried thoughts from which the doctrine of tomorrow may evolve. Items herein will normally be longer than letters but shorter and less well developed than articles—about 750 words maximum is a good guide. All contributions must be signed but noms de guerre will be used at the request of the author.* ON THE WAY!!



4 - 1 = ?

by Captain Jon R. Morse

The quantum jump in armor design—*XM803*—will be upon us in four to seven years. The main battle tank for the eighties has been discussed, lauded and damned. Its radical design features have been publicized within the professional community to the nth degree. The bilateral development program with the Federal Republic of Germany was heralded and then canceled. Nonetheless, despite praise and damnation, success and occasional failure, the decision has been made to continue unilateral development of a revolutionary main battle tank to meet the United States' armor needs of the future.

Typical of any new piece of equipment, the *XM803* will bring with it many bugs and problems which only the field user can anticipate or detect. It seems possible to prevent future field problems if we, as professionals, take the time now to identify potential problem areas and suggest possible solutions. True, the problem may have been identified and solutions already found, but we at user level don't know that. What is known is that we do not need additional problems tomorrow to complicate those on our hands today.

Four minus one appears to be a simple equation; yet in reality it is rife with problems. Among the many revolutionary features of the *XM803* is an automatic loader which replaces a crewman, in the true sense of automation. Design and mechanics aside, this device will pose problems to the user and his commander which, if not surmounted now, will cause ulcers tomorrow. So what does that simple equation mean?

To the tank crew, it means one less! One less man to accomplish the difficult job of operating, maintaining and tactically employing a highly complex tank. To the nonuser, a loader is replacing a loader. Ergo, no problem! Yet, to the tank crew, the loader is much more. He is a communicator, assistant driver, gunner

trainee, as well as another set of necessary hands. He helps in loading and unloading the vehicle; he aids in track repair; he helps wash and otherwise maintain the vehicle; he can stand to during Q-Service and so on.

Taken from another crew point of view, four minus one equals three. The crew, being an integral team, must function as such or fail in its mission. All must work together in each task. Design and development processes always attempt to decrease the machine-required maintenance tasks, but it seems questionable whether you can decrease total crew tasks or man-hours required, while increasing machine complexity. The crew will now have to accomplish its mission but with three men. Three men, that is, if it is up to strength and has no duty to pull.

The platoon leader counts five less. One less in each tank to man outposts during night security. Five less men to fill details when required. More importantly, five less will mean a need for more answers to his crew's questions on how to cope with fewer personnel.

To the company commander four minus one means greater complexity. There will be fifteen less men to accomplish an unchanged mission. In garrison, where is the cushion from which details may be drawn? How will adequate security in the tactical environment be maintained? Ever tried to pull a 50 per cent alert with three-man tank crews? What happens when one crew member becomes sick or wounded? Present day crews would move the cross-trained loader up to the more skilled position and suffer along with a new loader, but still accomplish the mission. Where does the two-man crew get its skilled replacement? Consider—if the right five men were sick or wounded simultaneously, a company would be 70 per cent effective.

The battalion commander's four minus one equals forty-five. He has all the aforementioned problems, plus unit training and readiness. What does elimination of the loader mean to him? Simply put, it means the end of his current concept of on-the-job training (OJT) to fill his immediate personnel needs. The day will be gone where a cook or mechanic can be pulled in for overnight conversion to a loader MOS. Drivers and gunners will be the need, and proper training requires extensive time investments.

Today, Armor Advanced Individual Training (AIT) produces a general purpose crewman/loader with sufficient basic knowledge to allow for eventual conversion to driver or gunner positions through OJT and minimal formal in-unit training. The advent of the new battle tank envisions creation of specialized AIT courses to produce fully qualified drivers or gunners with MOS awarded. This is necessitated by the complexity of the equipment and the elimination of a crew position from which to train other required skills.

The *XM803* MBT will possess an automatic loader, thus reducing the tank crew. Can a three-man crew efficiently operate, maintain and tactically employ this highly complex machine?

In turn then, will the battalion commander be able to fill his immediate personnel needs through in-unit schools and OJT; will the necessary expertise and training equipment be available to him; or will he be forced to rely solely on the personnel system to catch up to his unit's needs?

And what about advanced individual training? When *XM803* reaches the inventory, three other major vehicles will also be present: *M60A1, M60A1E2* and *M551*. The AIT system will be producing general purpose crewmen/loaders for the latter three vehicles and drivers or gunners for the former. Should the wrong MOS report for duty, will the individual's MOS training allow the commander a certain measure of interchange between the crewman and the vehicle available?

Then there is the rank structure for Armor enlisted personnel, which provides armor units with a great deal of pride and experience. Currently, the loader progresses via cross-training to become a qualified driver or gunner with the potential for E5 and an eventual potential of reaching E6 as a tank commander. Today, we contend that the responsibility and skill required as a driver or gunner warrants the grade of E5. When we start graduating fully qualified personnel, will they start at E5? Maybe they should since they will be required to fulfill all the responsibilities. On the other hand, what happens to the quality of armor units when two-thirds of each tank crew could well be E2s or E3s just out of AIT?

These questions are not simply dilemmas designed to condemn a new and revolutionary vehicle, but rather challenges lacking answers at this time. Answers to some are easy or just require a little ingenuity at crew and unit level. Others may require revisions to doctrine or organization comparable to the quantum jump in tank design being developed. The only adequate answer is that we, as Armor professionals, whether tank commander, battalion commander or Department of the Army staff officer, must anticipate these and other problems, and then devise and vocalize proposed solutions while the MBT is still under development. If we do not, the problems of tomorrow will truly be ours!

AWARD WINNER

ARMOR OFFICER ADVANCED COURSE 2-71

CAPTAIN JON R. MORSE, commissioned in 1965 from Norwich University, graduated from the Infantry Officer Basic Course and Intelligence Officer Orientation Course in 1967. After serving as a sector intelligence advisor in Vietnam, he was assigned to Headquarters, USAREUR. Captain Morse, a graduate of Armor Officer Advanced Course 71-2, is now stationed in Korea.

HOW WOULD YOU DO IT?

A PRESENTATION OF THE ARMOR SCHOOL

SITUATION:

In your first briefing as communication officer, the battalion commander indicated to you that he was not pleased with the operational status of the communication equipment in the 1st Battalion, 54th Armor.

The battalion received a satisfactory score on the last CMMI, but during the recently completed FTX, FM communication with the companies was sporadic. The battalion commander's rising concern about the upcoming ATT causes you to decide that in order to correct this communication problem, you must do three things: locate the problem and its cause; ensure that the proper repair is made; and check the equipment to ensure that it is ready for the ATT.

In locating the problem and its cause, you start by reviewing the records in the communication repair shop. You find that the equipment had been checked in the repair shop and found to be operational, but that once it had been installed in the vehicles it was just assumed that the equipment would function as well as it had in the repair shop. During the recent FTX the equipment would not function over normal operating ranges. This is what had caused the concern expressed by the battalion commander. You have located the problem and you realize that operational checks will not guarantee that the equipment will operate over the distances for which it was designed.

AUTHOR: CPT JAMES E. McATEE

ILLUSTRATOR: SP4 DAVID J. PEDLER

PROBLEM:

You locate the defective equipment and have it repaired by the battalion radio mechanics; you would like to test the equipment over the maximum planning range, but you realize that there isn't enough time. You know that you have to test the equipment to be assured of its operational readiness, How Would You Do It?

SOLUTION:

Use a simple field strength meter to measure the amount of radiation around the antenna. With this meter, you can effectively tune for the maximum output signal radiated off the antenna. Maximum signal radiation should obtain the transmission ranges for which your equipment was designed.

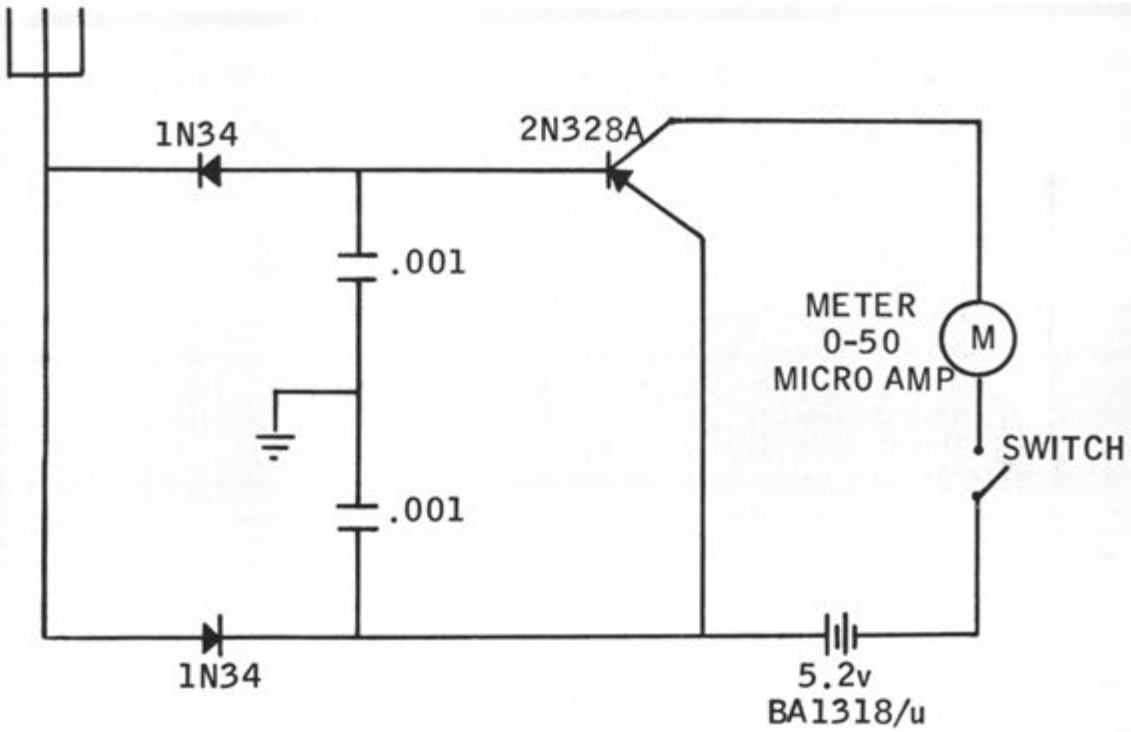
DISCUSSION:

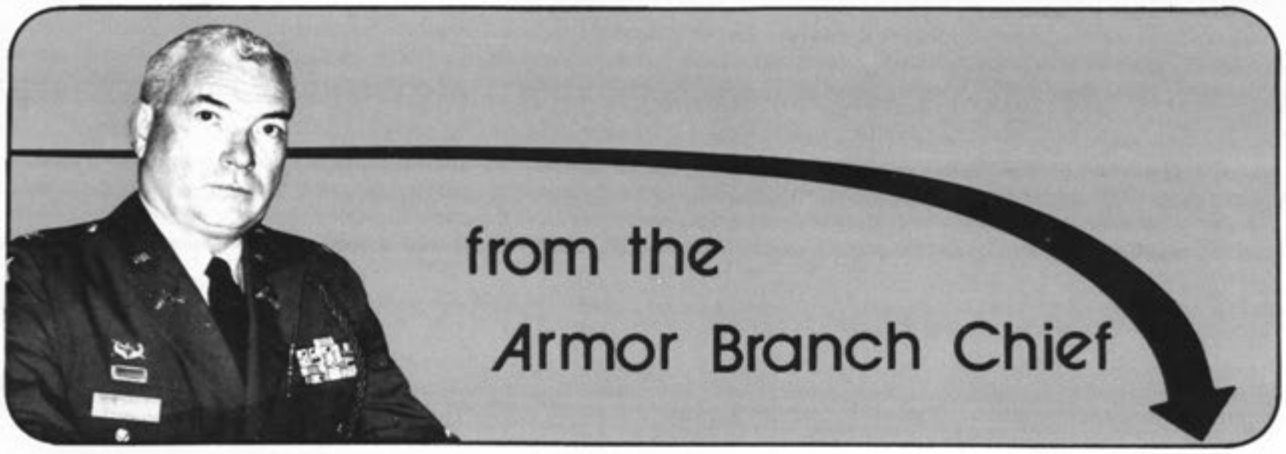
A field strength meter is a very simple piece of equipment. In fact, your field radio mechanic is capable of constructing one from salvaged parts. A diagram for a field strength meter is shown below.

The stronger the radiation from the transmitter, the higher the meter reading will be. The reading can then be compared with a reading induced under identical circumstances by a transmitter that is known to be operating at maximum output.

Field expedients such as this strength meter have always served their users well and these inventions are limited only by the imagination of the individual.

FIELD EXPEDIENT: TEST EQUIPMENT





Still More on Civilian Education

In the last issue of *ARMOR*, we related the opportunities for obtaining a bachelor's degree. The prerequisites which must be met to qualify for attendance in both the bachelor's and master's degree programs were also outlined. This article, our last on civilian education, summarizes the opportunities for obtaining a master's degree. There are four programs available for career officers to attend full-time to earn a master's degree. They are the funded Officer Graduate Program (OGP), the Degree Completion Program (Bootstrap), the Advanced Degree Program for ROTC Instructor Duty (ADPRID), and the service school (CGSC, NWC, AWC, ICAF) Cooperative Degree Programs. The major differences are in the degree of funding and the amount of time permitted for full-time attendance.

Officer Graduate Program—The Army Educational Requirements Board (AERB) establishes requirements for graduate level schooling annually. Quotas for the various fields of study are then allocated to the career branches. This Officer Graduate Program allows up to two years of study at an approved institution for the purpose of earning a graduate degree. Officers will serve a utilization tour in the AERB position upon completion of schooling. Applications may be submitted under the provisions of AR 621-7. The primary zone for this program is from the third through twelfth year of commissioned service.

Armor Branch receives most of its quotas for this program in hard science and business oriented curriculums. Very few quotas are received for the social sciences. Branch ascertains an officer's availability for assignment based upon his career needs and his demonstrated performance of duty. US Military Academy instructors are trained under this program, although the quotas and primary selections are determined by USMA.

Degree Completion Program—The Degree Completion Program is a part of the General Educational Development Program outlined in AR 621-5. The program is designed to enable personnel to complete requirements for a master's degree by full-time attendance at an accredited college or university for up to one year. Participants receive full pay and allowances, and the program includes a PCS move if the schooling is for more than 20 weeks; however, no other expense to the government is incurred.

Consideration for graduate level degree completion is based upon hours required for completion as well as performance of duty. The quotas for this program are not dependent upon specific academic disciplines and no utilization tour is required.

Advanced Civil Schooling for Senior ROTC Instructors—The goal of this new program is to achieve a method by which only officers with graduate degrees are assigned to ROTC instructor duty. The program encompasses either three or four years, depending upon the amount of time required for degree completion. Schooling will be conducted under the provisions of AR 621-5 for up to two years, followed by a two-year ROTC instructor assignment—at the same school whenever possible. DA Circular 621-7, dated 23 February 1971, further outlines this program.

Cooperative Degree Programs—The National War College, Industrial College of the Armed Forces, Army War College, and Command and General Staff College have ongoing cooperative programs with neighboring universities. These programs are based on students receiving graduate credit for a portion of the service college curriculum and then remaining at the cooperating university for a period of full-time attendance to complete the program. Funding is in accordance with AR 621-5 and is similar to the Bootstrap and ADPRID programs.

Armor Branch contact for all programs is Lieutenant Colonel Gary P. Graves, OXford 3-0690 or OXford 3-1475.

Officer Efficiency Reports

The importance of an officer's efficiency report cannot be overemphasized. They are among the most important documents in your record as they are considered in all major personnel actions such as reassignments, retention, schooling and promotion. The following notes are intended to assist you in preparing, reviewing or appealing OERs.

Non-Rated Periods Due to Participation in Degree Completion Programs—Attainment of a baccalaureate degree is one of the more important things a junior officer can do to enhance his potential. Officers are carefully screened prior to being selected for degree completion programs; therefore, in most cases, the non-rated period in no way adversely affects an officer's career potential.

OER Appeals—Reference DA Message 031621Z Sep 71, effective 15 October 1971, a five-year time limitation was placed on the submission of appeals for officer efficiency reports. A report beyond this time limitation is not subject to appeal if it can be determined conclusively that the officer had knowledge for at least two years of the existence in his official record of the efficiency report in question. A review of an officer's official military personnel file or his career branch file by his deputized representative will not be considered proof that the officer had personal knowledge of a particular report. No appeal will be authorized for an efficiency report which was part of an officer's official record when he was selected by a DA selection board for an earlier promotion. An efficiency report accepted by HQ, DA for the inclusion in the official record of an officer is considered to be administratively correct, to have been prepared by the properly designated rating officials, and to represent the considered opinions of such rating officials at the time of preparation. Therefore, the officer appealing an efficiency report must submit substantial evidence to support his claim that the report is administratively incorrect, lacks objectivity, or violates the intent of AR 632-105.

A frequent misunderstanding exists on the processing of adverse efficiency reports. When these reports are brought to the attention of the rated officer for his comments, the *rated* officer's comments *do not* constitute an appeal. Appeals (reclamas) are submitted and processed separately in accordance with paragraph 1-2e, AR 623-105.

Questions regarding appeal of efficiency reports should be directed to Major Sullivan at Armor Branch, OXford 3-1540.

Officer Strength Reduction Actions

Summarized below are the recent DA actions that have been taken to reduce the officer strength to the level authorized by Congress by the end of FY 72. The first priority for achieving the required losses is by maximum use of voluntary means. The second priority is involuntary losses from noncareer OTRA officers (Obligated Volunteer officers). The last priority, to be taken only after all other measures have been tried, is the involuntary separation of career OTRA officers (Voluntary Indefinite).

Voluntary Measures—(1) For FY 72, DA has removed all restrictions on voluntary retirements except the statutory requirement for 6 months service in grade in order to retire in that grade. DA Message AGPO 251220Z Aug 71 announced the changes. (2) Extended early release (from three to six months) during FY 72 to permit

officers to teach, attend school, or join a law enforcement agency was announced in DA Message AGPO 251800Z Aug 71 as amended by DA Message AGPO 021220Z Sep 71. (3) As a result of the world-wide survey announced in DA Message OPDCP-PP, 281557Z Jul 71, service obligations have been reduced to permit voluntary indefinite officers whose initial twelve month obligations expire in FY 73 to request relief from active duty (REFRAD) in FY 72. Those requesting REFRAD will be released between January and May 1972 on a phased schedule. Individual release dates were established by DA and sent to the field in command letters on 12 October 1971, followed by personal letters to each officer on 15 October 1971. If any officer who replied to the DA Message 281557Z Jul 71 has not received a letter with his new release date, he should immediately contact Armor Branch.

Involuntary Losses from Noncareer OTRA Officers—(1) Early release of Obligated Volunteer (OBV) commissioned officers of the basic branches has been extended from two to four months. Instructions on this extended early release were contained in DA Message DCSPER-PS&T 161855Z Aug 71. (2) Officers completing their initial OBV service during FY 72 are no longer receiving approval of 24-month extensions. In addition, all officers whose initial OBV service obligation expires in FY 72, and who had previously signed up for an additional 24-month OBV extension, are having their extensions curtailed and will be separated during FY 72. Letters through major commanders to the individual officers concerned were mailed from DA on 1 October 1971. (3) Approval of Voluntary Indefinite (VI) service agreements for officers whose OBV tour terminates in FY 72 has been sharply curtailed. Granting VIs to these officers compounds the problem of reducing strength to authorized levels. While the program has not been totally stopped, only the most outstanding are being accepted under strictly limited branch ceilings.

Involuntary Losses from Career OTRA—Paragraph 3-58, AR 635-100 (Change 10, 1 October 1971) outlined the procedures for both qualitative (paragraph 3-58a) and quantitative (paragraph 3-58b) releases. (1) Qualitative releases occur every year as part of the normal personnel management cycle of releasing those officers whose manner of performance is substandard. (2) Quantitative releases of officers who are doing an acceptable job are also required in FY 72 to meet strength limitations. This release, which was announced on 14 October 1971 by Secretary of the Army Froehlke, involves company grade commissioned officers and warrant officers. A Department of the Army Active Duty Board convened in October 1971 to consider officers for release under paragraph 3-58b, AR 635-100. Officers selected for release by the board will be notified early in third quarter FY 72 and will be separated in fourth quarter FY 72. This is the first time since 1957 that the Army has been required to separate quality OTRA officers in a reduction-in-force.

Duty With Reserve Components

The reduction in the strength of the Active Army, and the concurrent emphasis on reliance on the US Army Reserve and National Guard units, has increased the importance of the role of officer advisors to Reserve Component units. Reserve Component duty affords an officer an opportunity to make a unique contribution to the Army and it is not considered a dead-end in his career. We need officers as advisors, but only those who are well qualified and highly motivated will be considered for these important assignments.

***Coming in the next issue of* ARMOR . . .**

The Patton Papers, Volume I 1885-1940
Reviewed by MG Arthur L. West Jr., USA-Ret.

Military History and the Junior Officer
Captain Thomas E.C. Margrave

The Cavalryman's Century of Valor
Major Melvin R. Jones

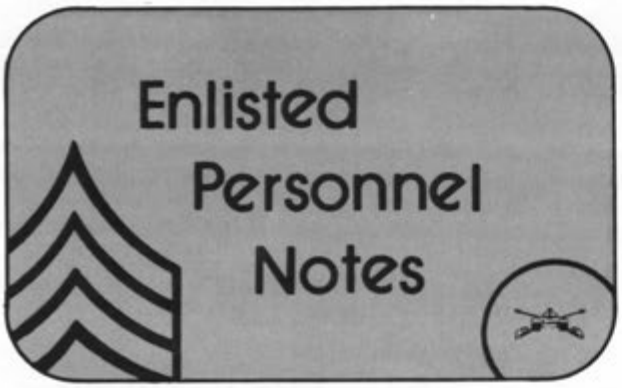
US Armor Association Saber Awards

The United States Armor Association annually awards a presentation saber to each of the top two Distinguished Military Graduates of the Army Reserve Officer's Training Corps who receive Regular Army commissions in Armor. Recipients are chosen by Headquarters, Department of the Army, using the same criteria as for the Marshon Award.

The 1971 recipients were First Lieutenant Michael I. Duke, who received the award from Major General William R. Kraft Jr., commanding general of the 3d Armored Division, at 1st Brigade Headquarters, Kirchgoens, Germany. The other saber was presented to Second Lieutenant Thomas R. Knox by General Ralph E. Haines, commanding general of Continental Army Command (CONARC), at Fort Hood, Texas.

First Lieutenant Michael I. Duke received his commission through the ROTC program at New Mexico State University in 1969. He has served as platoon leader and executive officer of Alpha Company, 2d Battalion, 33rd Armor, 3rd Armored Division, and currently is commander of the company.

Second Lieutenant Thomas B. Knox received his commission through Jacksonville State University, Alabama, in 1970. A graduate of the Armor Officer Basic Course, Airborne and Ranger training, he is now assigned to B Company, 2d Battalion, 67th Armor, 2d Armored Division.



From the Director of Enlisted Personnel

VOLUNTEER APPLICATIONS—IT TAKES TIME

So you have made the decision to volunteer for an overseas tour of service. A word to the wise—plan ahead. It can take at least two months to get assignment orders from the time of original submission of an application.

Because they do not realize the complexity of the assignment process, many soldiers become worried when, after a month or so, they have not yet received an assignment and have heard nothing on the status of their application. Processing volunteer applications is time-consuming, both for the field command and for DA.

To begin with, all applications must be submitted through the personnel office at the unit level. They are then forwarded through command channels for recommendation at each level. Applications for duty in Vietnam must be forwarded to DA regardless of approval or disapproval within the chain of command. For other areas of choice, however, the application may be disapproved by major headquarters. Disapproved applications are routed back to the volunteer.

Volunteer applications usually arrive at DA about a month after the date of original submission. Then they must enter the automated assignment system just as if you were being reported on normal AIT or AOR (rotation from overseas) rosters.

DA files the application and sends a card with personnel data on the volunteer through an initial processing machine run. This takes a week. The processed card is then matched against current requirements for the area requested. If no requirements exist for your grade and MOS, you will be notified at this time. If an assignment can be made, the matched assignment information and requirement cards are held for the next machine assignment run. These runs are made every two weeks.

The computers at DA then produce a roster containing assignment instructions. This roster goes out to each major losing command. The major command headquarters then forwards instructions to the specific losing installation within the command, and you receive your new assignment.

On the average, then, more than two months pass from the time an application is submitted to the time assignment orders are issued. If you are considering volunteering for overseas duty, take this under consideration and plan ahead. It takes time.

EES, KEY TO YOUR FUTURE

The film entitled "EES, Key To Your Future" has been updated to more clearly portray the ever growing role the Enlisted Evaluation System is serving under the Modern Volunteer Army concept. The film (MF12-5663) is now available at all field audio-visual centers. The importance of the Enlisted Evaluation System as a personnel management tool in the development of the soldier's career is dramatically portrayed.

The film focuses attention on the responsibilities of the individual soldier, commanders, test control officers, personnel officers and the Army's Enlisted Evaluation Center, toward the successful operation of the system. The more important features of the system and how it affects the individual soldier's future in such important personnel actions as promotions, award of proficiency pay, assignments, retention in service, and eligibility for reenlistment should be easily understood.

With the continuing emphasis that is being placed on the quality soldier under the Modern Volunteer Army concept, the viewing of "EES, Key To Your Future" is a must for all personnel regardless of rank.

BEING ASSIGNED TO A HOSTILE FIRE ZONE?

If so, then you should check your status in regard to the following additional requirements for the area. If you:

- Have not had a dental check, insure that dental examinations are accomplished and appropriate dental care completed in accordance with Chapter XIII, AR 40-3.
- Will be under 18 years of age at the time you are scheduled to report to the overseas replacement station, you are ineligible for assignment in accordance with Paragraph 8-1, AR 614-30.
- Are assigned to a country in which you were previously in a prisoner of war status, you are ineligible and should be deleted from the alert orders in accordance with Paragraph 8-1, AR 614-30.
- Are credited with a tour in RVN, you will not be involuntarily assigned to RVN unless expressly affirmed by Chief of Personnel Operations in accordance with AR 614-30 and AR 614-200.
- Are a sole surviving son, you must sign a waiver indicating that no objection is interposed for the assignment in accordance with AR 614-75.
- Have another family member in a Hostile Fire Zone, you may be eligible for a deferment. There are also other conditions involving immediate family members that may qualify you for deferment or exemption for assignment to a Hostile Fire Zone, in accordance with AR 614-30.
- Are in an aviation career field and are to be assigned in a flying status in Southeast Asia, you must personally handcarry during shipment, one full-length face-on photograph in fatigue clothing and one each of a front and side view of head and shoulders in fatigue clothing. All photographs are to be taken without

a helmet in accordance with Paragraphs 3-11, AR 612-2.

• Are otherwise fully qualified for shipment, you must have in your possession, only those clothing items prescribed in Chapter 7, AR 700-84, at the time you arrive at the Oversea Replacement Station or Aerial Port of Embarkation. The provisions of DA Circular 700-17 apply to officer and warrant officer personnel.

By insuring ahead of time that you meet these additional requirements for assignment to a Hostile Fire Zone, you will save unnecessary delays and expense. If you have any questions as to your eligibility for assignment, clear them up before you depart your home station.

OPO MILITARY PERSONNEL MANAGEMENT FILE

Army enlisted personnel in grades E7 through E9, special category, and military intelligence career fields receive intensive management and should know the importance of the OPO Military Personnel Management File.

This record is the copy of the 201 Files kept at the Enlisted Personnel Directorate, Office of Personnel Operations (OPO), in the Pentagon. This document is the key used in making assignments, promotions and other personnel actions. Complete and up-to-date records are crucial to enlisted career personnel and individuals can help insure that their DA files are accurate. Here are some positive actions for enlisted personnel:

• Make sure that your 201 File at unit level is complete and up-to-date. Insure that changes in status are dispatched to DA for posting to the OPO Military Personnel Management File.

• Visit the Enlisted Personnel Directorate in the Pentagon to review files personally when in the Washington area. In lieu of a personal visit, an officer or senior grade enlisted person may be authorized in writing to check your records. Because access to personnel records is strictly controlled, the authorization must be signed by the service member whose file is to be audited.

• Make sure that name, grade, social security account number and primary military occupation specialty are on every piece of correspondence sent, including photographs to DA.

AR 600-200, Chapter 3, Section IV should be consulted for the correct ATTN line for mailing information to OPO. Correct routing depends on the MOS of the individual concerned.

The following documents form the nucleus of the OPO Military Personnel Management File:

• Current Enlisted Qualification Record (DA Form 20).

• Photograph (See AR 640-30).

• Copy of letters of recommendation, commendation, appreciation.

• Copy of MOS Evaluation Data Reports (EPEECO Form 10).

• School transcripts or certificates.

• Any other document which may have a bearing on promotion, assignment, education, evaluation, etc.

Of particular importance are the preference statement and the evaluation data reports. Individuals have a personal responsibility to submit their preference statements, and to make sure that MOS tests are taken on schedule. These two items are among those most often missing or outdated.

Although promotions are administered by the Adjutant General, the data which centralized promotion boards consider comes primarily from the OPO Military Personnel Management File.

In summary, enlisted personnel in fields which receive intensive personnel management should remember that every action by the Department of the Army affecting them—assignment, promotion, reclassification, qualitative screening, education and evaluation—starts with a review of the OPO Military Personnel Management File.

ASSIGNMENTS FROM OVERSEA AREAS: IT IS UP TO YOU.

As a soldier stationed overseas, one of the most pressing questions is where will you be stationed once your current tour of duty is completed. The answer will depend a great deal on personal initiative in making sure DA knows what kind of assignment you are interested in.

Returning soldiers ranking through E6 can take advantage of the Advanced Overseas Returnee (AOR) card. Approximately four months prior to your return to the states, DA receives an AOR card. This card is punched with information provided by your losing command that will help DA issue your assignment instructions. The AOR card contains your name, social security number, rank, PMOS, number of dependents, ETS date, area preference for your next assignment and other information.

The AOR card is the type of picture the DA has of you, the individual enlisted man. Every effort will be made to honor desired reassignment if requirements for your grade and MOS in your area of preference exist, and if the Army's needs do not require you elsewhere.

In any event, the AOR card will be your ticket for a good reassignment and without it, there will be no basis for new assignment instructions for enlisted men ranking through E6.

Your part in this process is to see that this information on the AOR card is correct and up-to-date. Approximately six months or more prior to your DEROS, contact your unit personnel officer and correct any information which may be in error.

This check should include changes in your PMOS, recent promotions, updating your number of dependents and making sure your area of preference is correct.

Your area of preference for AOR purposes is the one given to your personnel officer or center, not the overseas and CONUS areas that appear on your Form 20.

With a correct AOR card filled out well in advance, you are giving yourself a much better chance for that assignment of your choice when you return from overseas.

Night Low-level Flight Aeroscout Training

The Air Cavalry Division of the Command and Staff Department, USAARMS, in conjunction with the 8th Squadron, 1st Cavalry, 194th Armored Brigade is presently teaching and demonstrating night, low-level aeroscouting techniques. This unit of instruction is presented in the Officer/Warrant Officer Air Cavalry Qualification Course and the enlisted Aeroscout Observer Course, portraying aeroscout elements in the conduct of night reconnaissance operations. The fundamentals of aerial night reconnaissance, innovations in night vision devices, means of active and passive illumination and their tactical employment in the night reconnaissance effort are taught in the classroom. The student participates in a one-hour night flight, conducted at low level (100 feet), which demonstrates the techniques of flight, navigation, target detection and reporting procedures.

This unit of instruction is the only such flight instruction formally presented in the Army, and prepares the student for assignment in an air cavalry unit, with the added capability of performing missions at night. Vietnam has shown the need for additional night reconnaissance capabilities; this instruction is a step toward filling that need. Nap-of-the-earth flight at night exists as a requirement for the conventional battlefield, and hopefully, will be incorporated in this training program as helicopter-mounted night vision devices become available.

Motor Officer Course

The Automotive Department has incorporated a branch immaterial aspect into its instruction on the Motor Officer Course. The course is nine weeks in duration, and upon graduation, the student will receive the MOS 0600, Motor Officer.

The instruction concentrates on giving the officer knowledge of administrative and tactical procedures, and the techniques and data necessary to advise, direct or supervise organizational maintenance. It also includes recovery of tactical and administrative vehicles, and a detailed coverage of associated armament and communications equipment. No security clearance is required and there is no obligatory service for Active Army commissioned officers.

Applicants must be commissioned officers, grade of captain and below, members of the Active Army or a Reserve component, and assigned or under orders for assignment to a position to supervise maintenance.

Future Developments for the Army Maintenance Management System

Draft-revised TMs 38-750 and 38-750-1 have been produced by the Logistics Doctrine, Systems and Readiness Agency (LDSRA) and are currently being staffed with major commands. Publication was in November 1971, with a tentative implementation date of 1 January 1972.

The revision standardizes the equipment selection criteria for both unit and materiel readiness reporting requirements; combines DA Forms 2408-7 and 2408-8 into a single form; eliminates the requirements for reporting bulk items; and simplifies procedures for reporting maintenance actions, EIRs and warranty claim actions. It also contains other changes which reduce workload at the unit and installation levels, and aligns TAMMS with an overall standard Army maintenance reporting and management system which is now under development.

In addition, the US Army Audit Agency (AAA) has scheduled an audit of TAMMS during the period November 1971 through April 1972. The audit is intended to provide an evaluation of maintenance performance below the depot level and a

review of the accuracy, timeliness and uses made of TAMMS data at all levels. The audit will not include aircraft, ammunition and data processing equipment.

Modern Volunteer Army

Since August, officer and noncommissioned officers at the Armor School have studied the Modern Volunteer Army. The Leadership Division introduces the subject with a short conference illustrated by 35mm slides and a TV film. Instructors relate future Army accession requirements and MVA goals to programs and leaders' actions toward a better Army. Emphasis is on recognizing groups who do not understand the MVA and providing leadership for them to support the program.

A panel discussion or practical work requiring student preparation of an MVA program follows, depending on the class level. Panels include the CG's special assistant for the MVA, officers with experience at previously funded VOLAR posts, and NCO and officer representatives of local commands. Such a panel can answer questions about MVA experience elsewhere and explain the Fort Knox program.

Human Research Unit (ARMOR)/HumRRO Division No. 2 Work Program for FY 1972

The Human Research Unit (ARMOR) and the Human Resources Research Organization, Division No. 2, members of the Armor Center Team, are currently involved in seven military research projects. The research projects, or work units as commonly called, are:

- Work Unit MBT. The objective of this unit is to outline the training methods and concepts for training materials that will be required by the personnel responsible for the development of programs for operation and user maintenance on the Main Battle Tank *XM803*.
- Work Unit ESPRIT. This unit will develop measuring instruments for determining motivation and attitude deterioration among enlisted men, and adapt and evaluate methods for increasing motivation and preventing attitude deterioration.
- Work Unit MEDIA. MEDIA will develop methodology for improved media implementation to meet specified training objectives in Army training programs.
- Work Unit COST. The objective of COST is to determine cost criteria that pertain to the selection of methods and media for use in Army instruction, and to develop cost/effectiveness models for use in the learning analysis phase of the CONARC Systems Engineering of Training.
- Work Unit PREVENT. This is an extremely important unit with the goal of developing a set of guidelines which would designate the qualities or characteristics of a successful drug education program.
- Work Unit RETURN. RETURN will develop a multivariate indicator system for predicting the probability or a military prisoner's successful adjustment to his environment after he is returned to duty. A secondary objective is to develop a multivariate indicator system for predicting the probability of a prisoner completing a pre-trial waiting period without further offense if assigned to a Personnel Control Facility (PCF).
- Work Unit NIGHTSIGHTS. The objective of NIGHTSIGHTS is to identify critical human factors problems in the use of new night operation devices, and to develop effective techniques for training men to use the devices.

In addition to the above work units, HRU (ARMOR)/HumRRO Division No. 2 will provide Technical Advisory Service (TAS) to any US Army military organization. From past experience, this service ranges from assistance to individual students in the Armor School to participation in Armor Center Team actions, and from sending literature to CONUS Active and Reserve Army units to providing advice to overseas commands. If you have a problem to be solved, (perhaps it has already been solved), don't hesitate to write to the Commanding Officer, Human Research Unit (ARMOR), Fort Knox, Kentucky 40121.

ARMOR OFFICER SCHOOL SELECTIONS

USA COMMAND AND GENERAL STAFF COLLEGE

August 72 – June 73

LTC Adams, Eural E
MAJ Alley, Frank M Jr
CPT Asselin Leo J Jr
MAJ Bacon, Carlton E
MAJ Barkman, Ralph A Jr
CPT Barrett, Thomas P
MAJ Blake, William B
MAJ Chole, Hilbert H
MAJ Collins, Jon D
MAJ Colliton, Jeffrey D
MAJ Conrad, Joseph C
MAJ Cooper, Nelson J
MAJ Crouch, William W
MAJ Davison, Michael S Jr
MAJ Deagle, Edwin A Jr
CPT Derrah, Donald W
MAJ Dillard, Walter S
MAJ Donovan, Timothy H Jr
MAJ Earwood, Harold J Jr
MAJ Eliot John H
LTC Evans, Walter C
MAJ Fintel, Arthur T
MAJ Ford, Randall L
MAJ Fournier, Albert L
LTC Gale, Edward W
MAJ Gardiner, Jan P
MAJ Glaze, James E
MAJ Goldsmith, Richard H
MAJ Gordon, Henry J
MAJ Grett, Stanley E
MAJ Grochowski, Gerald A
MAJ Gunderman, George L
MAJ Hartman, Clarence B
LTC Honore, Charles E
MAJ Hopkins, Robert G Jr
CPT Hurley, Robert D
LTC Johnson, Harry T Jr
MAJ Johnson, Preston
MAJ Jordon, Josef C Jr
CPT Kendall, Arnold E
MAJ Kendall, John L
MAJ Kennedy, John L
MAJ Kimes, Kenneth E
MAJ Larcomb, David J
MAJ Letchworth, Robert
MAJ Liles, Robert D Jr
MAJ Livengood, Delmer H
MAJ Lozier, Gary O
MAJ Ludlum, Charles D
MAJ Mason, Lloyd D
MAJ McDonald, Marvin L Jr
MAJ McMillion, David
MAJ Mowery, Robert W
MAJ Parker, Eliot V Jr
MAJ Pedigo, Bobbie G
MAJ Phillips, Robert L
MAJ Roberts, John C
MAJ Robinson, William A
MAJ Rowe, Dorsey E
MAJ Ruggerio, Dominic W
MAJ St Peter, Norman L
MAJ Searles, Jonathan W
LTC Shepard, James C
MAJ Simpson, William N III
MAJ Sloane, Robert L
MAJ Stewart, Thomas L
MAJ Stofft, William A
MAJ Taylor, Robert B
MAJ Tipton, James A
MAJ Wallace, Terrence M
MAJ Watson, Vaden K
CPT West, Arthur L III
MAJ White, Travis W
MAJ Wilkins, Harold H
MAJ Williams, Donald W
MAJ Yates, Carl W

ARMED FORCES STAFF COLLEGE

Class 52, August 72 – January 73

MAJ Colby, Nathaniel F
MAJ Felber, Joseph G Jr
MAJ Franks, Frederick M Jr
MAJ Garnett, James A
MAJ Gross, Joseph C III
MAJ Hutton, Paul C III
MAJ Shirley, Frederick W
LTC Sowers, William R Jr
MAJ Telenko, George J Jr

ARMED FORCES STAFF COLLEGE

Class 53, February 73 – June 73

MAJ Carter, George W
MAJ Crumley, Dennis V
MAJ Delumpa, Felix M
MAJ Dutcher, James A Jr
MAJ Getgood, John H
MAJ Haselgrove, Leighton O Sr
MAJ Loban, Gary G
LTC Mead, Dana G

AIR FORCE COMMAND AND STAFF COLLEGE

August 72 – June 1973

MAJ Waters, John K Jr

MARINE CORPS COMMAND AND STAFF COLLEGE

August 1972 – June 1973

MAJ Letonoff, Victor T

NAVAL COMMAND AND STAFF COLLEGE

August 1972 – June 1973

MAJ Folcher, Albert G Jr
MAJ Rutherford, Jerry R
MAJ Stockman, William III

news notes

LTG KNOWLTON PROMOTED

General W.C. Westmoreland and Mrs. Knowlton pin on star at promotion ceremony for Lieutenant General William A. Knowlton, Superintendent of the US Military Academy.

DYNAMIC TRAINING

Have you solved a problem or improved a training technique you think other soldiers could use effectively? If so, The Board for Dynamic Training wants to know about it.

The Board is made up of representatives from all combat arms and is currently meeting at Fort Benning to study training problems in Active Army, Reserve and Army National Guard Units. Its work is part of the Army Chief of Staff's Army-wide effort to stimulate professionalism in today's Modern Army. Making training dynamic is one way to achieve this objective.

Innovative training techniques and unique training devices are being assembled and scrutinized by the Board members. The Board is working to assist battalion and separate company commanders to overcome training restraints presented by limited funds, equipment, training areas and unexperienced personnel. The suggestions and ideas received by the Board are being analyzed and compiled in a usable form for distribution to all combat commanders.

Contribute to this overall effort to make Army training more zestful, imaginative and rewarding by sending your solutions and recommendations to:

BOARD FOR DYNAMIC TRAINING
Fort Benning, Georgia 31905

GYRO-STABILIZER TESTING ENDS

After five months of troop testing, the Gyro-stabilizer test program has been completed by the 2d Brigade, 2d Armored Division at Fort Hood.

The program was established to research the effectiveness of the Gyro-stabilizer unit on *M60A1* tanks. Conventional tanks must come to a halt to fire the main gun at a target; with the stabilizing system added on, the tank can fire accurately on the move.

The testing was divided into three parts: comparing non-stabilized tanks with stabilized ones in firing situations; testing the tanks in a field environment for field training exercise (FTX); and utilizing varied gunnery techniques at the platoon level.

The testing showed that there were absolutely no safety hazards, and the move to install the system in tanks is now under consideration.

LTC MOLINELLI NAMED AVIATOR OF THE YEAR

LTC Robert F. Molinelli

Lieutenant Colonel Robert F. Molinelli was named Army Aviator of the Year 1970-71 by the Army Aviation Association of America. LTC Molinelli served as commander of the 101st Airborne Division's 2d Squadron, 17th Cavalry. He is currently executive officer of the 2d Brigade (ACCB), 1st Cavalry Division (TRICAP) at Fort Hood, Texas.

McADAMS FIELD DEDICATED

The Armor Center had dedicated its main post foot-

ball field by naming it McAdams Field in memory of the late Captain Thomas A. McAdams.

Captain McAdams attended Fort Knox High School while his father, Colonel J.O. McAdams (Retired), was assigned there. Graduating from Texas Agricultural and Mechanical University in 1964, he was commissioned a second lieutenant in Armor.

After serving with the 2d Armored Cavalry Division at Fort Hood, and the 3d Reconnaissance Squadron, 2d Armored Cavalry in Germany, Captain McAdams attended the Armor Officer Advanced Course in 1967. Following completion of AOAC, he was assigned to the 11th Armored Cavalry Regiment in Vietnam.

It was while serving as commanding officer of "F" Troop, 11th Armored Cavalry, that he was wounded by enemy fire while directing his troop from a command helicopter. He died as a result of his wounds on 28 February 1969.

CPT CAUDILL RECEIVES CDC'S CREATIVE THINKING AWARD

Why would a soldier take rolls of chainlink fence into a battle zone? Is he planning to fence in all the ground he takes from the enemy or, perhaps, raise some animals?

If it's Captain Watson G. Caudill, a recent graduate of Armor Officer Advanced Course at Fort Knox, that fence just might be his lifesaver.

Captain Caudill utilizes the fence as a "standoff," which is a wire barrier to protect a tank by deflecting fin stabilized rounds and causing early detonation. Captain Caudill thought it took too much time to erect the standoff, so he designed a new method utilizing old air mattresses. The wire is wrapped around deflated air mattresses and hung around the tank in rolls. When the mattresses are inflated, they unroll and set up the wire standoff fence. The method takes only a matter of seconds and the individual soldier is protected because it can be done from inside the tank.

For his innovation, Captain Caudill has been given the Combat Developments Command's Creative Thinking Award.

THE DRAGON

The *Dragon*, a new antitank weapon, is fired from the top of a reconnaissance vehicle at Fort Benning. The man-portable Dragon, officially designated the *XM47*, weighs only 30.6 pounds, yet it is capable of destroying enemy armored vehicles and other battlefield targets.

CITY OF JOPLIN ADOPTS 1-4 CAV

The city of Joplin, Missouri, officially adopted the 1st Squadron, 4th Cavalry in connection with the 1st Infantry Division Unit of Choice program.

Joplin City Council Resolution No. 6261 reads in part:

> Whereas the Quarterhorse has a long and distinguished history . . . and whereas the Quarterhorse has indicated a willingness to participate in community affairs . . . and whereas a close relationship . . . will give our citizens a greater opportunity to know and appreciate our Armed Forces, now, therefore, be it resolved by the city council of Joplin, Mo., that the city adopt the 1st Squadron, 4th US Cavalry . . .

YO-3A, THE QUIET AIRPLANE

The Army's quiet airplane, the *YO-3A*, is shown operating in the skies of the Republic of South Vietnam. Powered by a slow-turning, three-bladed wooden propeller, the wide-winged *YO-3A* is designed for aerial reconnaissance.

FLAT OPTICS PROVIDE CAMOUFLAGE AND COUNTERSURVEILLANCE

Three-dimension work, which has been gaining widespread use in the advertising field to promote various products, may be used by the Army to hide things.

In-house research conducted by the US Army Mobility Equipment Research and Development Center, Fort Belvoir, Virginia, indicates that it may have application in the field of camouflage or countersurveillance.

Studies by the Center's scientists-engineers indicate that three-dimension work is applicable to three countersurveillance areas:

• One involves a flexible blanket that can be applied to personnel and equipment to reduce their detection and identification. • The second involves sheets incorporating the illusion of long range optical depth that could be cemented onto equipment to provide a 3-D pattern. • The third consists of strips of material

that can be quickly displayed to present optical illusions that would cause the enemy to hesitate or stumble.

Certain optical conditions can produce the illusion of depth and, according to a Center report, more recent developments produce this depth illusion in a thin, flat self-contained package. This depth illusion appears to have application to camouflage, providing it can be accomplished in distant applications which studies indicate may be practical.

The work conducted by the Center, described as "Flat-Optics," deals with lenticular, omnidirectional, moiré systems and combinations of these where no external mechanism for viewing is required.

MRS. WESLEY LEAVES ARMOR BRANCH

After 20 years of service with Armor Branch, Mrs. Lillian Wesley has begun a new career as a Department of the Army career intern. After six months of training, she will be assigned to one of the Army's professional career positions. Joining Armor Branch in 1951, Mrs. Wesley has served as supervisor of the officer qualification unit, assistant administrative officer, and since 1965, as administrative officer. Above, Armor Branch Chief Colonel James H. Leach presents Mrs. Wesley with a certificate of commendation.

SHERIDAN VEHICLE TURRET ELECTRICAL FAULT TESTER

The Sheridan Vehicle Turret Electrical Fault Tester is designed to provide organizational and support maintenance units the capability of detecting and isolating malfunctions with the *Sheridan* turret system. With this unique test set, tank turret repairmen can perform a complete diagnostic analysis of the electric drive control system, the main weapon system, as well as separate components of these systems.

At the organizational maintenance level, the test set is designed for use inside the turret. At the support level, it is primarily used in a bench test configuration. The bench test configuration provides support maintenance the capability of checking turret components to insure that they are, in fact, unserviceable when being turned in, and also allows them to check each component after it is repaired.

The tester is portable, weighs approximately 65 pounds, is 27 inches long, 15 inches wide and 12 inches high. The bottom half of the test set contains the test panel which consists of necessary meters, dials, indicators and cable jacks to perform the diagnostic

checks. The top half houses all the necessary cabling and is removable; therefore, only the test panel and proper cables need be placed inside the turret. Two men are required to operate the test set and to make necessary adjustments to the system under test.

With the tester connected to the proper test points within the turret, the repairman follows the trouble-shooting instructions given in the technical manual until a no-go situation is encountered. He then follows the specific no-go instruction and either makes an adjustment or replaces a faulty component and then performs a recheck of the system. If the adjustment was correctly performed or the new component is functioning properly, a go situation will be encountered indicating that the malfunction is corrected.

the tarpaulin

Covers a bit of everything gleaned from the service press, information releases, etc. Contributions are earnestly sought.

TAKE COMMAND

MG Thomas W. Mellen, 25th Inf Div . . . **BG Dewitt C. Armstrong III,** Ft. Devens . . . **BG James A. Grimsley Jr,** Chief, JUSMAG Philippines . . . **BG Carl E. Lay,** 30th Armd Div (ARNG) . . . **COL James Aarestad,** CofS, 1st Armd Div . . . **COL Hubert S. Campbell,** Asst Cmdt, USAAVNS . . . **COL Joseph M. Gay Jr,** 5th Bde, USATCA . . . **COL Samuel W. Smithers,** Inf, 2d Bde, 3d Armd Div . . . **LTC Jack W. Anderson,** 7th Sqdn, 17th Cav . . . **LTC Frederick H. Borneman,** Inf, 1st Bn, 7th Inf, 3d Inf Div . . . **LTC James T. Bramlett,** 1st Bn, 66th Armor, 2d Armd Div . . . **LTC James P. Holley,** Arty, 5th Bn, 14th Arty, 2d Armd Div . . . **LTC David A. Hopkins,** 8th Bn, 4th Bde, USATCA . . . **LTC William R. Frederick,** 3d Bn, 37th Armor, 1st Armd Div . . . **LTC Harold R. Johnson,** 15th Bn, 4th Bde, USATCA . . . **LTC Richard E. Lorix,** 1st Sqdn, 1st Cav . . . **LTC Francis B. Martin,** 7th Sqdn, 1st Cav . . . **LTC Chris Patte,** OD, 122d

Maint Bn, 3d Armd Div . . . **LTC Russell E. Rumney,** 3d Sqdn, 12th Cav, 3d Armd Div . . . **LTC Frank L. Smith,** 1st Sqdn, 2d ACR . . . **LTC Charles W. Zipp,** 2d Bn, 64th Armor, 3d Inf Div . . . **MAJ Shannon Clark,** 1st Army Flt Det . . . **MAJ Timothy C. Scobie,** C Trp, 8th Sqdn, 1st Cav, 194th Armd Bde.

ASSIGNED

MG Frank B. Clay, Military Advisor, US Peace Delegation, Paris . . . **MG Adrian St. John II,** Dir of Plans, DCSOPS, DA . . . **MG Gilbert H. Woodward,** Dep Dir, Joint Staff, OJCS . . . **BG Jonathan R. Burton,** Army and Air Force Exchange System, Dallas . . . **BG Jack W. Hemingway,** MASSTER, Ft. Hood . . . **BG Judson F. Miller,** ADC, 3d Inf Div . . . **COL Albert Ahrenholz,** Military Assistance Directorate, HQ USEUCOM . . . **COL George F. Carroll,** Dir, Nuclear, Biological and Chemical Materiel Testing Directorate, TECOM, APG . . . **COL Willard Latham,** CofS, Infantry Center . . . **COL Hubert W. Ogilvy,** USA Element, JUSMAG, Thailand . . . **COL George F. Otte Jr.,** PMS, Univ of Calif at Santa Barbara . . . **COL Clifford M. White,** Dir, General Equipment Materiel Testing Directorate, TECOM, APG . . . **COL Seth Wiard,** PMS, Jacksonville State Univ, Ala . . . **LTC Calvin R. Bean,** ODCOPS, HQ USAREUR . . . **LTC Denzel L. Clark,** Ft. Leonard Wood . . . **LTC Edward R. Coleman,** Chief, Fld Ex Div, Tactics and Combined Arms Dept, USA Fld Arty School . . . **LTC George R. Crook,** CDC, Ft. Huachuca . . . **LTC Robert H. Luck,** Dir, Command and Staff Dept, USAARMS . . . **LTC Sammy K. Mosley,** Literature Div, DDLP, USAARMS . . . **LTC Robert B. Osborn,** USA Element, HQ CENTAG . . . **LTC Glenn Otis,** 1st Bde, 3d Armd Div . . . **LTC Carl Putnam,** Infantry School . . . **LTC George Rostine,** G4 Section, VII Corps . . . **LTC Philip B. Samsey,** MASSTER, Ft. Hood . . . **LTC Frank E. Varljen,** DSCOPS, DA . . . **LTC Ted G. Westerman,** Office of the Asst Vice Chief of Staff . . . **CPT Juan Carlos Thompson,** Dept of Foreign Languages, USMA . . . **CSM Henry T. Branch,** 4th Bde, USATCA . . . **CSM Richard Gassard,** 101st Abn Div (Ambl) . . . **CSM Robert A. Young,** 6th Army . . . **1SG James M. Emerich,** HHC, 2d Bn, 63d Armor, 1st Inf Div . . . **1SG Larry V. Tiewater,** 1st Bn, 13th Armor, 2d Armd Div.

VICTORIOUS

The **1st Sqdn, 9th Cav, 1st Cav Div,** has been selected as the Outstanding Aviation Unit for 1970-71. The award, given by the Army Aviation Association of America, was presented at their annual convention held recently in Washington, D.C. . . . Distinguished Graduate of AOAC 2-71 was **CPT Dale L. Collie,** Inf; Honor Graduates were: **CPT James R. Gardner, CPT Kenneth C. Keating, CPT Thomas E.C. Margrave,** and **CPT Robert W. Maddon,** USMC . . . 3d Inf Div Annual Scout Squad Qualification Course winner was the **2d Sqd, Recon Plt, 30th Inf** . . . **Track C-35 of C Company, 4th Bn, 35th Armor,** amassed the highest score ever in USAREUR on the Tank Crew Qualification Course at the Granfenwohr training area. The crew, consisting of tank commander **SFC Jessie Hines,** driver **SP4 Paul Taylor,** gunner **PFC Jackie L. Reeves** and loader **PFC Michael Page,** scored 2,300 points out of a possible 2,920 on Range 80 during the final test of TCQC . . . **MAJ Charles A. White Jr.,** JAGC, and a former Armor officer, was one of five lawyers honored recently at the Federal Bar Convention . . . Distinguished Graduate of a recent rotary wing aviation course was **CPT Daniel W. Shalongo** . . . Distinguished Graduate of AOB 2-72 was **2LT Paul G. Liebeck;** Honor Graduates were: **2LT Henry H. Scheurer, 2LT Dean R. Parker, 2LT David B. Evans, 2LT Ronald G. Pearson, 2LT Michael J. Matheis** . . . **3d Armd Div tankers** maintained their reputation as USAREUR's top gun for the second consecutive year when 76.5 per cent of the division's tank crews qualified as combat ready on Range 80 at Grafenwohr. Leading the pack at the close of the annual TCQC competition was the **3d Bn, 32d Armor** which chalked up an USAREUR record-breaking 86.04 per cent qualification . . . The **1971 Bruce C. Clarke Award** was presented to **2d Bn, 16th Fld Arty Regt, 1st Armd Div.** General Clarke presented the award to the battalion's commanding officer, **LTC Herbert E. Williams** and **CSM William H. McArthur** . . . AOB 3-72 Distinguished Graduate was **2LT Albert L. Patterson;** Honor Graduates were: **2LT Timothy J. Reischl, 2LT Thomas R. Watson Jr., 2LT Paul I. Fineberg, 2LT Kenneth M. McCall,** and **2LT Donald B. Johnson.** Winner of the Military Stakes was **2LT Raymond Pierce** . . . The high battalion in tank gunnery in the 3d Armd Div was the **4th Bn, 35th Armor,** commanded by **LTC A.H. Anderson.** They had the high-scoring company, platoon, tank, and the all-time high daytime score in the division.

AND SO FORTH

The **3d Sqdn, 5th Cav,** have returned the unit colors to Ft. Lewis, Wash., ending another colorful and distinguished chapter in the unit's history. It arrived in Vietnam in 1966 when its strong and dependable fighting strength was needed . . . New president of the 2d Armd Div Association is **Martin B. Richard** . . . 180 **Royal Irish Rangers** recently arrived at Ft. Hood to participate in a six-week training exercise, Operation Gobi Dust . . . **Henry B. Davis Jr.** is the new curator of the Patton Museum of Cavalry and Armor at Ft. Knox . . . **1LT Robert Kendall,** Ft. Carson, a two-time member of the official US ski team, is seeking a berth on the US Nordic ski team . . . **Fran Cobb,** wife of **MG William W. Cobb,** US Commander in Berlin, made a recent hole-in-one at the Berlin Brigade's Golf and Country Club . . . **BG Samuel McC. Goodwin,** USA-Ret, has started construction of his Cross Sabers Ranch in Cerrillos, New Mexico . . . The **Eisenhower Museum** was recently rededicated in Abilene, Kansas. Mrs. Mamie Eisenhower and Lyndon B. Johnson took part in the ceremonies . . . **MG Philip Lindeman,** USA-Ret, is the new president of the 25th Inf Div Association . . . Any former member of the **Tropic Lightning Division** that is interested in joining the Association should contact **Jay V. Russell,** 225 Hart Lane, Ben Lomond, California, 95005 . . . The

State of Washington broke a 300-year-old tradition recently, when it enlisted the first Army National Guard WAC, **SP5 Dora Campbell.** Two days later, Alaska enlisted **SP5 Mary L. Cunningham** to further the breakthrough for women . . . Recently inducted into the Infantry Officer Candidate Hall of Fame was **CPT James A. Taylor,** a Medal of Honor winner from the 1st Sqdn, 1st Cav . . . **CW2 William "Monty" Montgomery,** 3d Sqdn, 12th Cav, 3d Armd Div, recently placed third in the World Archery Championship in Jokobsberg, Sweden . . . Congratulations to **Inside the Turret,** Ft. Knox, as they start their 25th publishing year . . . In recognition of saving the lives of her three sisters, eight-year-old **Marilyn Sanut,** daughter of SSG John C. Sanut, HHC, 2d Bn, 63d Armor, Ft. Riley, was presented the Hartford Insurance Group's Junior Fire Marshal Silver Medal Award . . . **12th Armd Div reunion** is scheduled for 27-29 July in Dayton, Ohio . . . The new National Commander of the American Legion is **John H. Geiger,** a former member of the 42d Tank Bn, 11th Armd Div . . . **MAJ Clive Milner** has assumed duties as the Canadian Forces Liaison Officer to the USA Armor School . . . The commanding officer of the newly organized Criminal Investigation Command is **COL Henry H. Tufts** . . . Sheriff of the Potomac Corral of Westerners is former *ARMOR* Editor **William G. Bell** . . . Our apologies to the **1st Bn(M), 138th Inf, Missouri ARNG,** for incorrectly referring to them as the 1-184th Inf(M) in the article "Active Army, Reserve and Guard Make Roundout a Success," which appeared in the last issue.

Statement of Circulation

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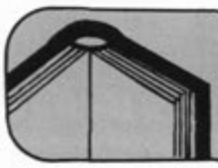
I certify that the statements made by me above are correct and complete. J. M. Durkott, 1LT, Armor, Managing Editor



from the bookshelf

COURT-MARTIAL

by Robin Moore and Henry Rothblatt. Doubleday. 410 pages. 1971. $6.95.

The novel about the Green Berets' murder case is neither truth nor fiction. But it is strange that Henry Rothblatt, an able trial lawyer (author of many works on trial technique and procedure), would collaborate with Robin Moore (author of *The Green Berets* and *The Country Team*), in recording the trial lawyer's after-the fact daydreams about a case in which he had appeared as defense counsel.

The novel is based on the skeletal facts of the Green Berets' case which involved the clandestine, unlawful killing, without benefit of trial, of a double (or triple) agent. According to the book, the victim worked as an agent for the 5th Special Forces Group. The fortuitous capture of some photographs showed that he may have worked for the VC, betraying his American associates to torture and death. The book suggests, also, that he served as an intermediary between Hanoi and certain South Vietnamese officials plotting to overthrow the Thieu regime.

When the accused, all members of the 5th Special Forces Group, discovered the victim's role as a double agent, they sought guidance from the CIA, but not from their military superiors. As they claim that no guidance was forthcoming, they took the law into their own hands and eliminated the agent. These facts surfaced because the dead man's handler, fearing for his own life, sought refuge from the local CIA station chief. Murder charges under the UCMJ were preferred and the accused were confined.

In true life, the charges were dismissed because the accused would have been denied a fair trial in view of the refusal of CIA personnel to testify as to their role in the affair. In the novel, however, the case proceeds to trial and acquittal, affording the authors an opportunity to depict Henry McEwen—the fictional defense lawyer—as a combination Sherlock Holmes, Perry Mason, Emile Zola and Don Juan who quickly discovers all the skeletons in the closets of Washington and Saigon. These discoveries are shrewdly used in a campaign to obtain a favorable disposition for his clients through blackmail.

An extensive press release campaign mounted by McEwen is central to this effort. As he undertakes the defense, McEwen comments:

> We're not apt to get the charges against our clients dismissed on the basis of strict legalities . . . We have to embarrass . . . the Army, the CIA, even the Administration.

McEwen's own doubts as to the professional propriety of his tactics are betrayed when he comments:

> This isn't the way to handle a criminal case. In my whole career I have never had more than a routine mention in newspapers covering my cases. In civilian practice, . . . publicity can never do your clients any good. . . . But we . . . aren't dealing with a professional or ethical situation. A legal crisis has been precipitated which makes impossible the normal operations of professional methods. . . . And whether you realize it or not, this onslaught of publicity might be a blot on my career the rest of my professional life.

The legal crisis referred to was the decision to press on with the prosecution of a legally unjustified, unlawful homicide despite the efforts of the defense to try the case in the media. Those who seek to vindicate the rule of law, and who are not infected by the philosophy that the ends justify the means, are subjected to a crude "Catch-22" treatment by the novelists.

Despite Rothblatt's expertise in trial procedure, the book makes some egregious procedural and ethical errors. Two examples:

- One of the accused Green Berets was given a grant of immunity in order to compel his testimony about the alleged murder. McEwen did not withdraw as the lawyer for the witness until the witness actually took the stand. Thereafter, McEwen prevailed upon his former client to subject himself to punishment by refusing, on nonlegal grounds, to testify.
- After the trial started in Long Binh, McEwen succeeded in getting a "change of venue" to the Pentagon on the grounds of improper command influence. Relief on these grounds would

require a change in convening authorities and new court members, but in the book it was a mere change of the place of trial. The convening authority and court members—all allegedly tainted—remained the same.

These errors suggest that Robin Moore wrote the legal portions of the book, as well as the political sequences.

Apart from the question as to whether it is proper for a trial lawyer to collaborate in a novel which shows his unconvicted clients to have committed a serious crime, the book leaves many other unanswered questions. Considering the level of readers at whom the novel is apparently aimed, the most significant unanswered question is:

Can a middle-aged bachelor defense lawyer find happiness in the arms of the murder victim's beautiful and talented sister-in-law, whom he had wooed away from his client, an amorous, dovish United States Senator, who had retained the lawyer to extract the girl from the jaws of the Vietnamese police in order to: (1) marry the girl, and (2) conceal his association with at least one of the murdered triple agent's principals?

For those tempted to buy the book, the paperback is recommended. It should not clutter a permanent library.

Waldemar A. Solf, Office of the Judge Advocate General

THE COURT-MARTIAL OF LT CALLEY
by Richard Hammer. Coward, McCann & Geoghegan. 398 pages. 1971. $7.95.

Lawyers, as a group, have generally rated high among the world's least humble individuals, rarely passing an opportunity to recount their exploits. If Richard Hammer may be taken as representative of his group, then newspaper reporters are clearly a match for attorneys in the ego department. The perpendicular pronoun appears so often in this book that one senses that the author feels rather possessive about the whole My Lai affair. Perhaps it is his case. He has worked at little else for the past two years and this is his second book on the subject.

The book is written on at least three levels. The documentary account of the trial itself, and of the events preceding the trial and immediately following the findings, is first-class reporting. The author includes a judicious selection of documents such as the Ridenhour and Daniel letters, and quotes at length from the testimony and proceedings at the trial with good summarizations of the omitted portion. He provides interesting, if shallow, background portraits of the principal participants. All in all, he does an admirable job of making a genuinely squalid affair seem glamorous, and a legally routine case, though factually complicated and politically sensitive, seem substantially more exciting than it could possibly have been in real life.

The second level consists of irrelevant and superfluous interjections of vignettes involving the activities and social life of the journalists and the hangers-on who clustered around Fort Benning during the trial. The principal flaw here is that the ego shows through and Hammer permits himself the luxury of taking pot shots at John Sack, Lieutenant Calley's official biographer.

The third level (on which the book opens and closes) betrays the author's, and probably every reporter's, underlying desire to be an editorialist or commentator. On this level, he seeks out the deeper social significance and lets his own views run rampant. He is generally antiwar, and specifically opposed to the Vietnam involvement. The tone is consistently antimilitary, though he concedes the existence of some redeeming features (the trial was fair and the result just). Much of the editorializing is accomplished by way of parenthetical observations and inferences which are, for the most part, either flatly erroneous or at best logically unwarranted or inconsistent. Often pejorative in tone, and in some cases almost scurrilous, he reveals himself as something less than an altogether objective commentator. Hammer picks up the now tiresome litany of the anti-Vietnam intellectuals (unnecessary, immoral and obscene), accepts it, and perpetuates the charge that the real atrocity is attributable to those who developed the policies that led to the Vietnam involvement, without, it should be noted, developing any evidence to support that charge. Quite unintentionally, the author, by faithfully tracing the prosecution case, largely refutes his own thesis. My Lai was, indeed, if the prosecution evidence extracted by Hammer is believed, an aberration in the United States' conduct of the war.

All in all, the book does not live up to the puffing claims on its dust jacket. The Calley case is not the "court-martial of the century," nor is this account of it one of the most important and influential books of the year. The massacre and the trial were politically and socially significant events. The case is not legally significant in the sense of creating new law or legal precedent, for it has not done that. What is significant is the unprecedented fact that an undefeated nation, in the midst of an on-going war, had the moral fortitude to bring to trial members of its own forces on charges which (though tried as violations of the Uniform Code of Military Justice) constitute war crimes.

The military reader will react to the Hammer commentary ambivalently: agreeing wholeheartedly with some observations, being incensed by some of the unsubstantiated charges, and being mildly annoyed at the petty pin-pricks at the Army.

The author was clearly in a rush to publish before the story was too cold to sell. One result was inadequate research. There are a number of specific errors of both fact and law, the most blatant of which was the statement that dum-dums, and by imperfect analogy the *M16* projectile, are proscribed by the Geneva Conventions. The dum-dum is, indeed, outlawed, but by the Hague Rules of 1907. The 1949 Geneva Conventions do not even approach the subject of weaponry.

For those not already bored by the whole affair, the book is worth reading for the documentary account, but not worth the hardcover price, as the rush to publish also resulted in poor proofing, inexpensive paper and shoddy binding.

Major Fred K. Green, JAGC

THE MAKING OF A HERO: The Story of Lieutenant William Calley Jr.

by Wayne Greenhaw. Touchstone Publishing Company. 226 pages. 1971. $6.95.

From the supposed testimony of his two weekend donut dolly bed companions through the allegation that he kept a sloe-eyed sleeping bag wench for field use, this book is unbelievable. It is unbelievable that William Calley should be thought of as a hero, yet Greenhaw does nothing to develop Calley's hero status—he presumes the reader will concede that at the outset. The crowning incredibility is that the publisher would have the unmitigated gall to ask subsidization of his lack of literary acumen at $6.95 a copy. Insipid, insulting, inconsequential, yellow journalism at its vulgar best.

DAS

GERMAN MACHINE GUNS

by Daniel D. Musgrave and Smith Hempstone Oliver. MOR Associates. 456 pages. 1971. $17.50.

The authors have intended this book not only as a textual reference, but also as a history of the development of the machine gun in Germany. As such, this book is destined to become a classic in its field in that it provides, for the first time, an in-depth view into the early developmental phases of one of the greatest of the great weapons of World War II. The basic format of the book, 8½ x 10¾, provides ample space for detailed technical drawings and historical photographs. The illustrations and photographs, many previously unpublished, are interesting and clearly related to the text.

Beginning with the latter portion of the 19th Century, the development trends of the German machine gun are traced through the 1950s. The authors next offer basic terminology and abbreviations followed by analysis of the many different types of machine guns utilized during World War I. In each section, the reader is impressed with the ability of the authors to provide in-depth technical information without destroying the context of the section or confusing the novice.

The discussion of the development of the basic machine gun for World War II, the *MG42*, is particularly interesting from the standpoint that it reveals the reluctance of the established arms industry to undertake development of a machine gun which could be manufactured by any sheet metal or metal fabricator without the aid of skilled craftsmen. Many times today we find a reluctance amongst the normal producers of an item to innovate or to seek simplifying changes which would make their product less exclusive, but more valuable in actual use. Once again, the authors clearly interweave both the previously known facts and little known history in a very readable fashion. Subsequent chapters describe other German automatic weapons and other foreign machine guns which were and are utilized by the German Armed Forces.

This book is very easy to pick up and very hard to put down; the illustrations and historical perspectives alone are worth the price. From a military viewpoint, it is significant to realize that there is no modern machine gun in existence today which does not incorporate some features of the German machine guns described in this text. To date this book provides the single most factual description of German machine guns and their development.

Major Neil S. Williamson III,
Ordnance Branch, OPO

SOUTH TO BATAAN, NORTH TO MUKDEN. The Prison Diary of Brigadier General W.E. Brougher

by D. Clayton James. University of Georgia Press. 1971. $10.00.

This is a thought-provoking book for those who will take the time to read the day-to-day accounts of existence in a Japanese prison camp. A stark framework of daily conditions, malnutrition, disease, beatings and the struggle for survival is interwoven with the underlying philosophy of a man who endured the suffering, chronicled his thoughts and lived to bring them with him when he regained his freedom.

Brigadier General W.E. Brougher distinguished himself as a competent, decisive leader in the unsuccessful defense of the Philippines where he commanded the 11th Infantry Division. On 10 April 1942, with the fall of Bataan, General Brougher and his men became prisoners of the Japanese.

The narrative account of the campaign in Luzon is extremely well-written and provides a clear picture of the valiant defense waged by American and Filipino troops against overwhelming odds. The immediate military threat of the strong Japanese invasion force was compounded by the general lack of preparation and support of the American and Filipino units. ". . . the 11th Division, command of which was given to Brougher in September (1941), lacked one-third of its full infantry complement, its field artillery regiment was not formed until after the war began, and the anti-tank company was never organized."

An underlying feeling of betrayal is evident in Brougher's later writing even though it was concealed from his men during the conflict. The promised aid from the United States, the air support, supplies and reinforcements which never materialized, kept the men fighting against impossible odds and only when the order to surrender was transmitted did the full impact of the hopelessness of the situation strike home. Even at that, the desire to fight on remained unshaken in Brougher's men. This, in itself, is a tribute to his ability as a leader.

With the surrender, Brougher's status changed from a commander to that of prisoner of war. With the loss of freedom came an apparent loss of decisiveness and daring which had been characteristic of Brougher's actions while commanding the 11th Division. As a prisoner, there is no indication that he ever considered action against his captors nor did he become involved in escape plans. He seemed to accept his fate and found solace in memories of his family and loved ones, association with a group of close friends and the dissociation from reality he found in his writing. The small pleasures of daily life, gardening, an occasional bridge game and the relaxation of reading one of the numerous literary works available to him, provided a means of traversing the often unbearable periods of hardship.

In the camps on Luzon, Taiwan, Kyushu and in Manchuria from 1942 to 1945, General Brougher was rarely conspicuous among the prisoners. This is, perhaps, to be expected since he was in the company of such men as Lieutenant General J.M. Wainwright, Major Generals George F. Moore and A.M. Jones and notably high ranking general officers from the British and French forces.

On the other hand, General Brougher's

strength of character, imperturbable exterior and gifted ability as a poet served to establish him as a respected and well-liked individual. His beliefs in and loyalty to his God and his country were uncomplicated, unshakable and sincere. They, along with his deep love for his family, formed the basis for an unwavering hope which sustained him through the darkest days and his greatest suffering. He became a leader in a different role, that of inspiration and hope for his fellow prisoners.

In an analysis of the conditions of the Americans and prisoners of other nationalities, it is vital to understand that the men in Brougher's camps were high ranking officers to include general officers and the civilian governors of Hong Kong, Malaya, North Borneo and the East Indies. The treatment of these individuals, though extremely harsh at times, hardly compares with the suffering endured by lower ranking officers and enlisted men in other camps. Suffering is relative and the degree of suffering and hardship that can be endured by an individual is unique to that individual just as his interpretation of that suffering is unique. An analogy drawn by Dr. Viktor E. Frankl, a survivor of Auschwitz, can be applied here. "A man's suffering is similar to the behavior of gas. If a certain quantity of gas is pumped into an empty chamber, it will fill the chamber completely and evenly. Thus suffering completely fills the human soul and conscious mind, no matter whether the suffering is great or little. Therefore, the 'size' of human suffering is absolutely relative."

The staggering loss of lives in the prison camps can be attributed initially to the total unpreparedness of the Japanese to deal with the numbers of prisoners captured. Brutality and vindictiveness, coupled with an ethnic insensitivity to the needs of the caucasians exhibited by the captors during the infamous "Death March" and at various periods during the term of imprisonment, were an unforgivable cause of many of the deaths.

Disease and malnutrition took long range tolls, but intangible factors of hopelessness, despair and the loss of determination to survive in the face of adversity contributed greatly to the attrition. It becomes easier to die than to struggle for survival. Those who survived, General Brougher included, did so because of inner strength and determination rather than through dependence on material benefits.

Although Red Cross packages were received and the prisoners were allowed to grow crops, raise pigs and purchase items of necessity at a prison store, an inconsistency in their captors' policies precluded maximum usage of these benefits to adequately sustain a reasonable level of health. Vegetables were allowed to rot in the fields and Red Cross supplies often went unissued as the Japanese rationed food to the prisoners. As a result, starvation level conditions recurred in all the camps in which General Brougher was held.

These men were fortunate in one extremely important area. The cause they supported was just and the country for which they endured their suffering was united behind them. Even though General Brougher felt that high level unpreparedness had, in effect, sacrificed him and his men to their fate, he maintained a deep rooted love and respect for his country and a dedication to the military. Years of service had ingrained the principles of duty, honor, country and there was no reason for him to question the basic validity of his commitment. Release of virtually uncensored news by the Japanese to their captives assured the Americans after 1943, that an Allied victory was imminent. Thus, they could see the glimmer of freedom's light ahead. The steadfastness of their beliefs and loyalties under these circumstances is understandable.

At this point, the experiences of General Brougher deviate from the experiences of American prisoners in Korea and Indo-China, and any comparison in prisoner behavior must be considered in the light of ideological conflict. The human reactions of self-pity, selfishness and the various manifestations of the struggle for self-preservation are common to both as are examples of unselfishness and self-sacrifice.

The question of dedication and loyalty to cause and country is entirely different. In the prison camps of Korea and Vietnam, the battlefield is in the mind. The prisoners are struggling for physical as well as mental survival in an environment where their cause is debated, their country divided and their military condemned. There is no hope for "victory" in the sense of General MacArthur's victory and their captors flaunt support for the enemy cause from within the very borders of the United States. The Code of Conduct was unnecessary in the Japanese prison camps because there was no reason to doubt. In Korea and Vietnam, the element of doubt was instilled and nurtured. Men can be condemned for their suffering, merely because it occurred in Vietnam.

Nietzsche put it well when he wrote, "He who has a *why* for his suffering can bear with almost any how."

Major James N. Rowe

The reviewer was a Viet Cong prisoner of war for five years. THE EDITOR.

WEST OF ALAMEIN

by Colonel G.B. Jarrett. Sentry Books. 192 pages. 1971. $13.95.

West of Alamein is a disappointing work concerning the war in the North African desert. There are an excessive number of mistakes in the book, chiefly editorial and substantive in nature.

The term Afrika Korps, for example, is incorrectly spelled on a number of occasions. Captions and pictures are often mismatched, and there is a plethora of captions with incorrect information. One caption describes an Italian 47mm SP gun as being mounted on an *M13/40* tank chassis, when it is obvious from the photograph itself that it is mounted on an *L6/40* chassis, as were all production models of Italian 47mm SP guns.

There are major errors in the textual material as well. One of the more obvious ones is the statement that in August 1941, there were four German and seven Italian divisions in Rommel's Army. In fact, in August 1941, Rommel's Panzer Gruppe Afrika consisted of two corps, the much-vaunted Afrika Korps (DAK) comprised of one Italian and three German divisions, and of the XXI Italian Corps, comprised of four Italian divisions and remnants of another, giving a maximum of nine divisions under Rommel's control, only three of which were German.

While the book has some interesting photographs, it is an unfortunate but inescapable fact that the captions and the text are fraught with errors. Absence of in-depth research, lack of comprehensive understanding of the subject matter, and failure to pay attention to detail are much in evidence throughout the book.

It is also apparent that the author is particularly ill-informed concerning the Italian effort in the desert and has only a superficial knowledge of the

history, development, employment and identification of Italian armored vehicles. The regrettable lack of information in English concerning the Italian contribution to the Axis campaigning in North Africa, and the even greater vacuum of information relative to Italian armor certainly has not been rectified by any information presented in this book. It is possible that the erroneous information presented relative to Italian equipment, rather than making any worthwhile contribution to the knowledge of the English reader, may instead add further to the misunderstanding and confusion which already exist in this subject area. All in all, the general accuracy and reliability of this work are suspect.

Captain Raphael A. Riccio

THE BRASS RING: A Sort of Memoir
by Bill Mauldin. W.W. Norton & Co. 275 pages. 1971. $7.95.

A sort of irreverent memoir at that is this humorous chronicle from youth to graduation from the Great War as a full partner in the unforgettable triumverate with Willie and Joe. Nostalgia for those old enough to remember War II, and an education of sorts for those who think of those years as ancient history. In either case, an entertaining, brash and fresh sort of self testimonial by the nation's maverick military cartoonist-commentator.

DAS

THE SUNSHINE SOLDIERS
by Peter Tauber. Simon and Schuster. 263 pages. 1971. $6.95.

PRIVATE
by Frank D. Gilroy. Harcourt, Brace and Jovanovich. 151 pages. 1970. $5.95.

Dealing with events a quarter century apart, these books display both the continuity and disparity between the soldiers of today and yesterday. Neither author has any particular love for the Army. Neither displays a marked devotion to his immediate superior nor his senior commander. Both do their jobs. From that common bond, their appreciation and view of things martial diverges.

Gilroy is an accomplished writer and Pulitzer Prize winner for his drama "The Subject was Roses." His brief stream of consciousness novel is a carefully constructed collection of bursts of lucid and laconic images of the military past. Tauber comes across as a petulant, patronizing and snippy—yet well-educated—youth who writes and writes and writes with frequent long sentences, much detail and great clarity.

Gilroy—the World War II soldier—had the richer experience, being drafted, going through basic training, heading overseas on a troop ship and serving in combat with the recon troop of the 89th Infantry Division, altogether a two-and-a-half year stint. Tauber's entry into the jaws of hell came as a New York City reservist who opted for six months at Fort Hood as an alternative to any more horrid experience, such as service in Europe or Vietnam.

Gilroy—in his thoroughly delightful collection of word-pictures—reminds us that GI Joe in World War II was no automaton, no unquestioning robot, but a man who accepted duty he did not relish in a war he assumed was just. The fact that this kind of man was a highly competent and often inspired soldier should be brought home to us from time to time. In his highly personal way, Gilroy does this as no scholar can.

Tauber's journal is longer and even more revealing. Peter is a most modern youth. His writing and somewhat smug use of a great big word on a sergeant obviously less educated than he comes early in the book and indicates that Tauber is intelligent, though hardly mature. He is, indeed, astute, and his observations are recorded with an uncanny accuracy. He sees a lot in basic training. He hates the Army quite deeply, yet with a kind of involvement, a manner of despising it while looking at it from within and as he is part of it. His views, perhaps, might be profitably examined by those who are honored with leading the Volunteer Army through the valley of the shadow the press tells it is now in.

In consonance with much of his generation, Tauber caustically views the Army as a great conspiracy, as the quintessential Establishment tool to corrupt pure youth. He writes: "And slowly, measureably, faintly but thoroughly, the Army, the world, America and the universe mark us, other men and ourselves, and work their evil as we work it on each other; and we are different."

Yet Tauber is willing to do the hateful banal, stupid requirements he so abhors. For him, the six-month decision is made and he will keep his part of the bargain. In his platoon, the right-wingers, new-leftists, the Blacks, Puerto-Ricans, the smart and the dumb all agree on this point regardless of how silly or seriously they see their condition. And therein lies the odd bitterness of the Tauber journal. The company jerk, the inept slob who never could do anything right, this butt of all the company's jokes is passed, right along with the others, and the poor soul stands with the company at basic training "graduation," just like those who hated it but did the work anyway, just like those who willingly cast their lot with the Army and eagerly pursued the martial art. Outraged, Tauber says: "The secret is out: the Army doesn't care. No matter what you do, it'll pass you—lie, prostitute itself, expose itself, betray itself—if you promise not to go AWOL. That's all. No effort is required, just a little inertia or cowardice." So slobs and soldiers all make it through that which Tauber calls "American High," a sort of super high school, a rite of passage into society, as it were.

So we have two young soldiers, one laconic, one loquacious. One writes years after the event, the other keeps a daily journal. Both are astute, yet quite different as their Army experience is gauged. For Gilroy, much of the anger that any man feels entering a highly controlled organization is either eased by faint bemusement or gone with the years. His work is perceptive, not angry. Tauber, of course, lashes out again and again in his lucid and spiteful rhetoric.

Yet irony marks the comparison, for Gilroy, the World War II type who accepted things, did them well and then came home after a long period of service, seems almost unmarked by it all compared to Tauber. Gilroy sees, acts, feels, as Gilroy. He remains much the individual, though many today will tell us how sheeplike the soldier of the Big War was. Tauber, the one who screams individualism from beginning to end, is so enthralled with his attack on the Army and its seeming mass of inequities, faults and corruptions, that by his very careful examination of the Army he is strongly immersed in it, indelibly marked by it, its impress deep on his soul. Tauber seems almost to exist only in relation to the Army. Tauber versus the Army is the only Tauber we see. Gilroy exists as Gilroy, a man who was in the service and experienced many things there.

So who, then, is the Army's man?

John Albright

WESTERN TECHNOLOGY AND SOVIET ECONOMIC DEVELOPMENT, 1930-1945

by Antony C. Sutton. Hoover Institution Press. 401 pages. 1971. $12.50.

Antony Sutton's volumes on Soviet development produce no surprises for students of contemporary Russian affairs. The theme pursued in this series is that of the assimilation of Western, chiefly German and American, industrial know-how and machinery by the Soviet Union. Sutton surpasses other studies in this field in the exhaustive detail he has amassed in support of the familiar argument that Soviet growth, especially in heavy industry, has been inordinately dependent on the West. This book serves well the author's purpose in supplying an empirical study that documents what was largely presumed until now.

The bulk of this work is a meticulous examination of the individual patents, designs and engineering services transferred to the Soviet Union. The consistent penchant for breach of contract and shortchanging on salaries and expense vouchers reduced markedly the Soviet outlay for these services. From the earlier assistance contracts to the Lend-Lease grants that enabled Russia to emerge from World War II a powerful industrial base, though ravaged in resource and manpower, Sutton recounts in impressive detail the Western origins of technology in each sector of Russian heavy economy: irrigation projects, hydroelectric plants, automobile and tractor plants, chemical and textile operations, machine and tool manufacture, and construction engineering methods and management.

Of particular interest to readers of military professional journals are the revelations on defense industries. Sutton has included a chapter on Soviet military aircraft, ordnance, ships, and, of course, tanks. Relying for his analysis on the noted armor expert, Richard Ogorkiewicz, the author concludes that the military sphere has seen the most inventive use of foreign designs by Russian technicians; they have constructed some admirable vehicles which incorporate and improve upon the best features of outside models.

Sutton also goes beyond the detail on machine and design in a perceptive discussion of the difficulties of assimilating advanced technology into a relatively backward economy. The advantages of industrial copying for an underdeveloped country are obvious in that all the trial-and-error of a research and development effort is avoided. However, the uneven progress in related areas of the developing economy usually makes "borrowed" prototypes impractical or impossible to maintain, a factor that leads to more borrowing.

The dilemma of the attempts to modernize Russia under Lenin and Stalin becomes evident from the lengths to which they went to "get the basics" from the West. But the race to absorb advanced methods and models from the outside and the drive to build a technical skill base to support this, while perpetuating the myth of singlehanded socialist achievement, have imposed strains that tax Soviet leadership today.

Fred Beck, OCMH

THE RACE FOR THE RHINE BRIDGES

by Alexander McKee. Stein and Day. 490 pages. 1971. $8.95.

Of all the operations mounted within the European theater during World War II, none was bolder, more innovative, or held more promise of shortening that campaign than "Market-Garden," Montgomery's daring plan to secure a bridgehead over the Rhine against a crumbling German Army in September 1944.

Basically a two-pronged attack, one by parachuting the newly formed First Allied Airborne Army, a three-divisional force, to capture the bridges at Eindhoven, Nijmegen and Arnhem, then a rapid overland link-up by the British Second Army, the operation held the promise of a rapid capture of the vital Ruhr and, it was hoped, a complete collapse of the enemy's military and political machine.

Instead of a brilliant victory, however, the Allies, in general, and Montgomery, in particular, suffered one of the most serious setbacks of the war. The most serious consequence of the defeat was, of course, that it closed the door on any outside hopes Montgomery might have had to pursue his narrow-front strategy into the heartland of Germany and end the war before the end of the year. Market-Garden failed for many reasons, some of which are thoroughly retold in this engaging book by British military historian Alexander McKee.

Actually, the Market-Garden operation is but part of the book's main thread: tracing the three campaigns across the Rhine during World War II—by the Germans in 1940, by the Allies in 1944, and, finally, across the length of the Rhine in the spring of 1945. It is with the retelling of the Arnhem story, however, that this book really grips you, for McKee tells its story, after a biased overview of Allied strategy, from the "grunt" level—and this is where the author shines.

A veteran of the major European campaigns as a member of a British unit attached to the First Canadian Army,

McKee writes with authority and an acute flavor for the bouquet of battle. Drawing heavily upon official diaries and eye-witness accounts by friendly and enemy participants, the author weaves a masterful story of the entire operation. *If* McKee leaned too heavily upon recollections of former British soldiers, his position can be justified since the Arnhem portion of the operation *was* a British effort and the tragic heroics of its 1st Parachute Brigade have since become legend.

McKee places the blame for overall failure on none other than General Dwight D. Eisehnower for permitting the operation to begin "with insufficient resources, in the hope that the Germans could be kept on the run everywhere, so that all five Allied armies could simultaneously arrive on the Rhine in 1944." His assertions about diverting air transport from the Canadian Army and from Patton's Third Army to support Montgomery's bold move will be argued for some time to come—but there's little doubt that it hurt. However, the failure of the ground link-up force to press home its attack with enough verve and energy to avoid disaster, and the failure of the 82nd Airborne Division to capture the main bridge at Jijmegen by a coup de main (even though it wasn't in the plan) should have been illuminated. They weren't, nor was the sacrifice of a rapid clearance of the Scheldt Estuary, which occurred when Montgomery turned his attention to the Rhine and the Market-Garden operation: this later oversight has since been judged by American historian Chalres B. MacDonald as one of the most serious tactical errors of the entire European campaign.

The 1940 German operation to secure the Rhine bridges offers several interesting contrasts in time, tactics and airborne development with the Arnhem operation, while the Allied 1945 campaign is strictly standard fare.

While this work is bibliographically deficient, lacks sufficient detailed maps to adequately follow the course of events, and is studded with a continually shocking antiAmerican bias (Eisenhower "was a general in rank only and could not control his team, largely because he had no ideas of his own . . ."), I nevertheless recommend it to military history buffs for its interesting treatment of a most controversial operation.

Major John G. Fowler Jr.,
University of Rhode Island

PLAYING SOLDIER: A Diatribe by Frank Getlein. Holt, Rinehart & Winston. 168 pages. 1971. $5.95.

By dictionary definition a diatribe is, ". . . a dissertation directed against some person or work; a bitter and violent criticism; an invective . . ." Mr. Getlein's diatribe, in the best tradition of the definition, is full of anti-establishment, anti-military, anti-Pentagon, anti-everything invective ad nauseum.

It is the epitome of the current spate of similarly oriented diatribes. The US has lost the war in Vietnam. Military and industry in the US have conspired to maneuver the nation into a state of "permawar"—a permanent condition of military embroilment that preserves the military-industrial stranglehold on the country. The US is a unique sort of military dictatorship. The Pentagon never tells "the truth if a lie will serve as well." And so on to the "people smelling cockroaches" the military has mobilized to sniff out the elusive foe in his jungle hideaways.

So bitter, so vituperative, so misleading, so inaccurate, so false and utterly devoid of any redeeming value is Mr. Getlein's book that an objective review of what he has written is beyond the state of the art.

DAS

LETTERS TO THE EDITOR
(continued from page 1)

personnel carriers (the Hispano Suiza and the Hotchkiss) during this period.

At the same time that the interim program was established, the so-called VRFWS-Successor requirements were written and a QMR (Qualification Material Requirement) was to be prepared as rapidly as possible for this follow-on weapon. Remember, this is still back in 1962. The various user agencies and the developers had many meetings concerning the specific requirements for this weapon, and the program finally evolved into the "Bushmaster" Project Manager's Office. This was to provide a superior weapon suitable for mounting on the new Armored Reconnaissance Scout Vehicle, the Mechanized Infantry Combat Vehicle, and possibly the main battle tank.

The Request for Proposal for Program Definition of the ARSV has already been issued. The MICV Request for Quotation is in the process of being issued also, and the VRFWS-S or "Bushmaster" is still not a reality.

Having been involved in this program from its inception, I feel that this is a typical example of the problems faced in our present Army and DOD organizational structure in not only fielding a weapon to meet an operational need, but simply in agreeing on the characteristics of such a weapon. This system is a fairly simple one, but the same thing is happening in the case of more complex weapons systems. For instance, the ARSV and the MICV were delayed many years because of this lack of agreement on requirements and needs.

The massive reorganization of the Army which took effect in August 1962, to enable closer cooperation between the user and the developing agencies, to cut down the development cycle, and to field better, more reliable weapons systems, simply has not accomplished its mission. Possibly a new look at the mechanism to convert user requirements into field hardware is in order.

GEORGE A. TUTTLE
Colonel, USA-Ret.

Grosse Pointe Woods, Michigan 48236

MBT Design Competition

Dear Sir:

In recent months, my brother, John, and I have received numerous requests from the readers of *ARMOR* for details on our entry in the US Armor Association's MBT Design Competition.

Unfortunately, our supply of copies of the proposal is exhausted; however, copies of the patents on the concept are available from:

Commissioner of Patents
United States Patent Office
Washington, D.C. 20231

The vehicle mechanical and armor patents can be purchased for 50c each and the design patent for 20c.

The patent numbers are:

Vehicle design —No. 196,779
Vehicle mechanical —No. 3,215,219
Armor protection —No. 3,351,374

I hope the above will be of some assistance to the readers of *ARMOR*.

ROBERT W. FORSYTH
Upland, California 91786

Robert and John Forsyth won first place in the US Armor Association's Main Battle Tank Design Competition in August 1962. THE EDITOR.

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By Shabtai Teveth. Written by an Israeli journalist, who fought as an Armored Corps reservist in 1967. It was described by General Moshe Dayan as "an outstanding book, the best I have read about our wars." Illustrated. 290 pages.

HISTORY OF THE UNITED STATES ARMY . . . $12.95

By Russell F. Weigley. This excellent, scholarly work presents not only names, places and events but, perhaps more importantly, it places the Army in the context of the times from the Revolution to today. Accounts of the Regular Army, the Militia, the National Guard and the Reserve makes this book interesting and enjoyable to read. Illustrated. 688 pages.

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By B. H. Liddell Hart. This magnificent work is based largely on his personal collection of private documents and the author's constant study of the day-to-day events of the war. Must reading for students of military history. 768 pages.

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By S.L.A. Marshall. This is his latest account of American soldiers at war during the battles of Dong Tre, Lung Luong and Hoa Hoi. A vivid description of the officers, NCOs and other soldiers who fought in the victories. 242 pages.

GENERAL

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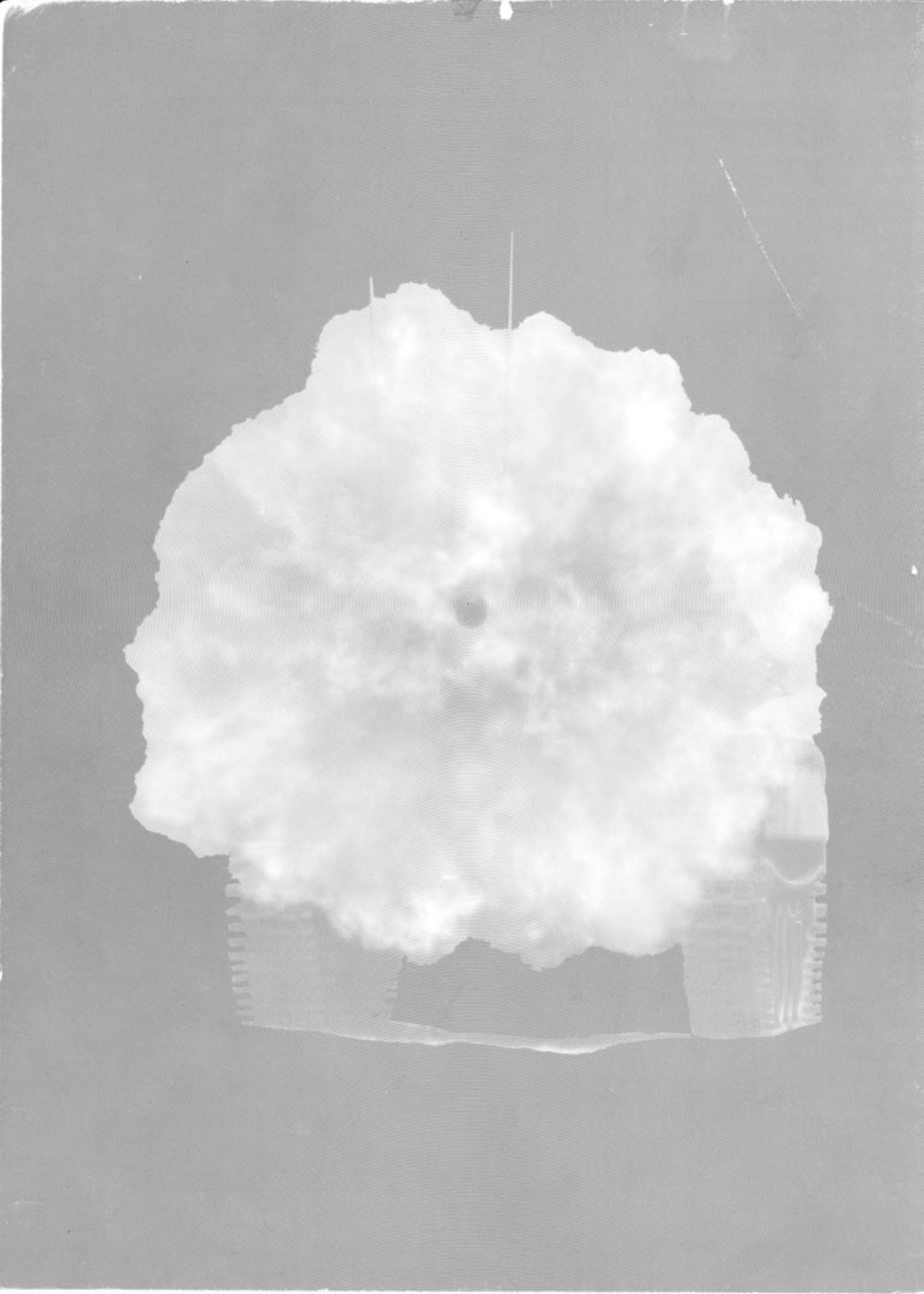
By Colonel Wesley W. Yale, General I. D. White and General Hasso von Manteuffel. Foreword by General Lyman L. Lemnitzer. Three thinking soldiers make a strong case for blitz warfare as an alternative deterrent to either nuclear holocaust or attrition. Their views on the leadership required to make such a defense posture a reality are stimulating. Must reading for the far-sighted military professional. Maps, charts. 257 pages.

MILITARY MEN $6.95

By Ward Just. This book is now being widely discussed. There is much disagreement on whether it is for or against the Army, fair or unfair, true or untrue—in whole or part. It is must reading for the Army man of today. 252 pages.



ARMOR
MARCH-APRIL 1972

THE PATTON PAPERS I: 1885-1940

By Martin Blumenson

Reviewed by MG Arthur L. West Jr., USA-Ret.

83d Annual Meeting
The US Armor Association
Fort Knox 18-20 May 1972

Mark your calendars and start planning to attend the 83d Annual Meeting. Further details, registration and proxy forms will be mailed to all Armor Association members by 15 March 1972.

THURSDAY, 18 May 1972

0800 – 1600	Arrival and Registration
1830 – 2200	Cocktail Buffet with the American Ordnance Association (AOA)

FRIDAY, 19 May 1972

0800 – 0810	Honors Ceremony
0820 – 0830	Commanding General's Welcome
0830 – 0900	Keynote Address by General Ralph E. Haines Jr.
0900 – 0945	Presentation by Armor Agency—"Armor on Tomorrow's Battlefield"
0945 – 1000	Coffee Break
1000 – 1100	Highlights of Armor Activities
1100 – 1200	Presentation by Armor School Faculty and Students—"Challenges of Armor Today"
1200 – 1400	Lunch-Business Meeting (Patton Museum Presentation)
1400 – 1630	Armor School Field Training Exercise, St. Vith Range
1630 – 1830	OPEN
1830 –	Cocktail-Banquet with AOA

SATURDAY, 20 May 1972

0900	Executive Council Meeting, Red Room

The Fighting Vehicle Systems Section, Combat and Surface Mobility Division of the American Ordnance Association and the Blackhorse Association will again conduct their meetings concurrently with the US Armor Association. For further information on their activities contact:

American Ordnance Association
740 15th Street NW
Washington, D.C. 20005

The Secretary
Blackhorse Association
PO Box 11
Fort Knox, Kentucky 40121

THE PATTON PAPERS I: 1885–1940

by Martin Blumenson

1,024 pages $15.00

Few generals have been more praised, hated, honored and misunderstood than George S. Patton Jr. A man of many masks, he is familiar as the great combat leader of World War II, commander of the Third Army and archetype of the sweeping field commander who, with his glorious tanks, swept across Africa, Sicily, France and Germany. Yet many of the most intriguing sides of General Patton have remained hidden. Until now, no historian has had available to him the full range of Patton's complex mind, a mind as much tormented by doubts and driven by passions as it was inspired with dreams of military glory.

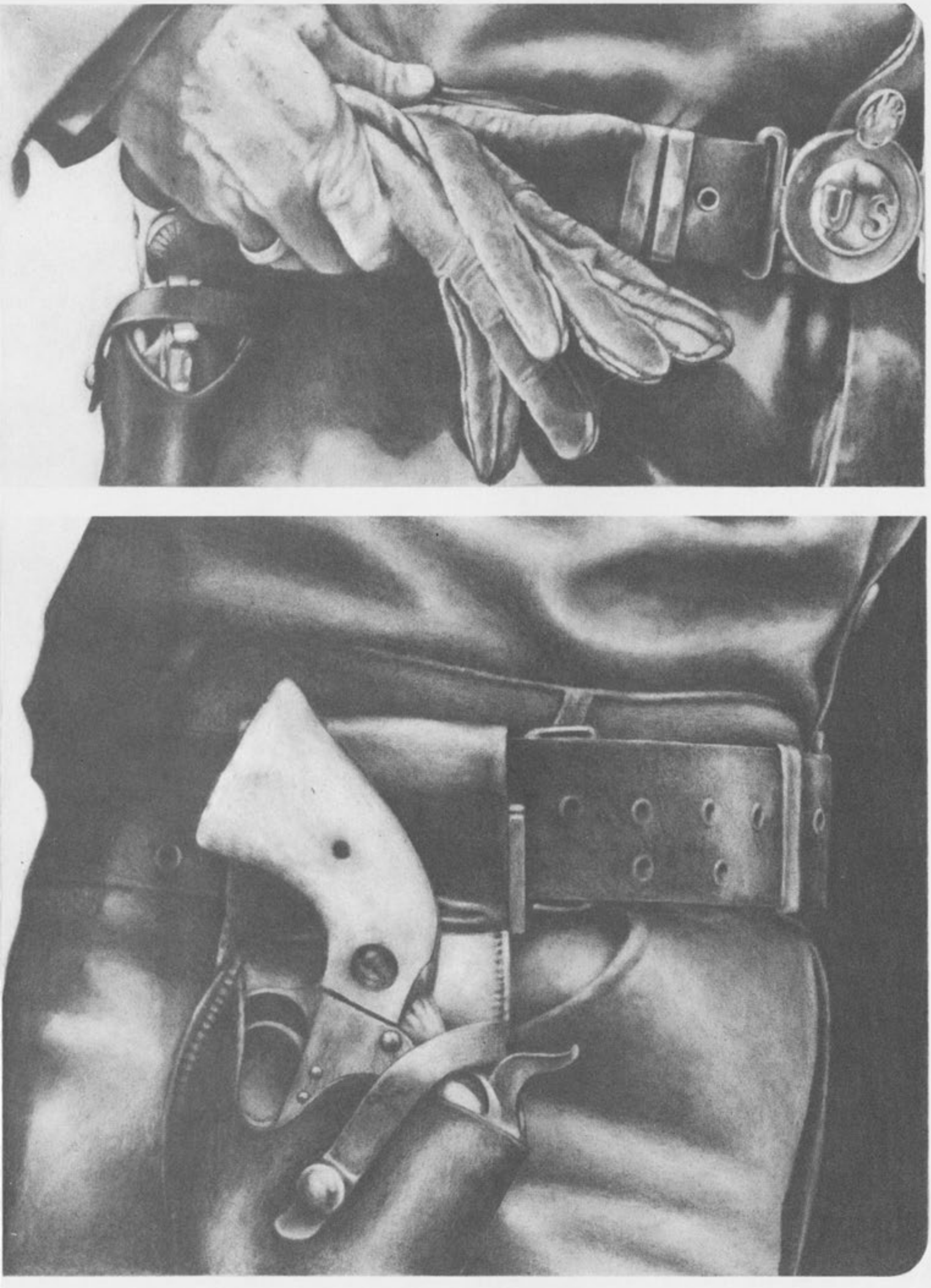
To Martin Blumenson, the distinguished military historian, the Patton Papers have been opened, permitting a full-scale edition of all the significant documents—among them personal letters and diary entries. Mr. Blumenson has woven them into a stirring narrative which speaks with unparalleled clarity and force. Here, then, for the first time, is the opportunity to see Patton in all his aspects, as legend, soldier and man.

Volume I carries Patton's story to 1940. It shows the formation of the young warrior and how he prepared himself for the unique leadership he exercised in World War II. Here is the youthful Patton, conscious of his heritage as a member of a military family and totally absorbed in the fulfillment of his destiny. One sees his self-doubts, as he struggled to define for himself his life, particularly at the Virginia Military Institute and later at West Point. One sees too the nature of Army life in those days, by turns exciting and monotonous, as the young Patton was shunted from one military post to another, during what he considered onerous years of peace.

With his service under General Pershing in the Punitive Expedition in Mexico in 1916, came the first real opportunity for military life as Patton wished it. There quickly followed the great years of World War I, during which he transferred from the cavalry to the tanks, organized the first tank school, and led his men in the St. Mihiel and Meuse-Argonne Offensives. It was in these years that the Patton legend emerged.

Between World Wars I and II, as Martin Blumenson displays, there were years of frustration and often of hesitation. They were also lean years for the Army, as Congress cut appropriations to a minimum. But these two decades were full of controversy, and Patton was at the center of the storm, involved in an ongoing debate between supporters of a mechanized Army and defenders of traditional cavalry units. As one would expect of such a strong-willed man, Patton's positions were always forceful, but they were often shot through with subtle reservations.

To all who would wish to understand the real Patton, the modern Army, and the course of 20th century history, the Patton Papers constitute an essential document. No portrait of General Patton can ever be the same again.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ARMOR

the Magazine of Mobile Warfare

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ARTICLES

FEATURES

DEPARTMENTS

ON THE COVER . . .

Patton—from a young cadet to a distinguished general—is so vividly portrayed by *ARMOR's* well-known artist, CW2 Chet Jezierski.

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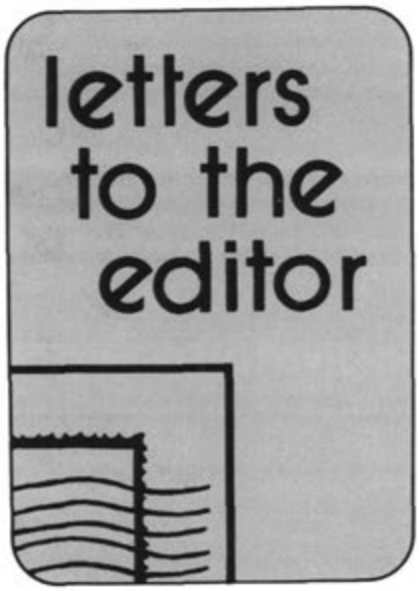
letters to the editor



A medium should be a two-way means of communication. Recently, ARMOR *has had little interaction between its readers and the articles published in the journal. We want our readers to analyze and think for themselves about the role of modern Armor. With the last issue, we feel we accomplished this. Here are a few samples of letters received in rebuttal to "Death of the Tank."*

THE EDITOR.

Dear Sir:

Lieutenant Colonel Warren W. Lennon's apparently premature announcement of the death of the tank in the January-February issue of *ARMOR* reminds one of the famous Mark Twain comment, "The reports of my death have been greatly exaggerated."

There probably are readers who are as indignant as the author in his opening statement said he expected them to be. But a careful reading leads one to believe that he meant something quite different than would appear from the title of his article. In the first place, he said that "the combat vehicle of the future" probably will not resemble the tank of the present. This is not surprising because the tank of today bears little resemblance to the tank of 1916. But by making the point, he obviously does not believe that the tank is dead.

Instead, what he seems to be asserting is that the tank is dead if its role is to be limited to that of a mobile fort moving with and at the pace of infantry on foot as it has been in Vietnam. Thus, while the combat vehicle has changed since 1916, the tactics in use apparently have not. Perhaps Colonel Lennon, by using an arresting title, only meant to call attention to that.

ROBERT J. ICKS
Colonel, USAR-Ret.
Elmhurst, Illinois 60126

Dear Sir:

The article by Lieutenant Colonel Warren W. Lennon of the Australian Army in the January-February issue which proclaims "The Death of the Tank" does not substantiate anything of the kind. In fact, toward the end, the author recognizes the continued need for mobile ground weapon platforms, which is precisely what tanks are.

When its melodramatic claims are ignored, what is left of the article amounts to an argument that future tanks will be different from those of today. This no one can deny. But it is very doubtful whether future tanks will assume the form suggested by Colonel Lennon.

To support his argument Colonel Lennon does, of course, state various facts. Unfortunately he does not appear to have analyzed some of them sufficiently and his conclusions are consequently questionable.

For instance, he notes the limited protection offered by armor but fails to recognize the fact that, in spite of its weight penalties, heavy armor is still well worth having. This is not because it will ever make tanks invulnerable but because it makes them more mobile, by allowing them to move more freely in face of fire from many weapons and to a greater extent than any foreseeable improvement in their automotive performance.

Wheels are certainly an attractive alternative to tracks for light armored reconnaissance vehicles, as I have tried to point out in *ARMOR* for the past twenty years. But in suggesting that they might be used for more powerful combat vehicles, Colonel Lennon ignores their inherent disadvantages, which are obvious to anyone with the slightest knowledge of soil-vehicle mechanics.

One other point worth singling out concerns the cost of tanks. They are undoubtedly expensive, though no more so than some other items of military equipment, including attack helicopters. However, tanks need not cost as much as the *XM803* whose development has been exceptionally costly, partly because it was mixed up with politics. Other contemporary tanks cost only a fraction of what the *XM803* does.

RICHARD M. OGORKIEWICZ
London, England.

Dear Sir:

I picked up with surprise and dismay the article entitled "The Death of the Tank" by Lieutenant Colonel Warren W. Lennon. After reading the article, I believe the author has sound valid ideas but also a complete misunderstanding of the role of tanks. I stress the plural tanks and not the singular.

Too often the tank is evaluated on the basis of its ability to accompany and support infantry. This is only a secondary role. It evolved because of the infantry's demand for tank support, both for the attack of long-range targets and because of the tank's inherent antitank capability which in all conflicts has been much preferred to the unusually well-touted infantry antitank weapon of the period.

The principal role of tanks is to be employed in mass: penetrate weakly held sectors, and strike deep destroying combat and service support, headquarters command posts and logistical facilities. In most cases, such an attack will completely disrupt the enemy's defensive scheme as no other type force will. The shock effect is obtained primarily from the accurate machine gun fire and the terror of being flattened like a pancake by the tank tracks.

The key principle to success is mass. Our field manuals do not specify numbers of tanks for effective mass. However, from my experience and military reading, I am of the opinion that a minimum of 40 well deployed tanks on a front about 2,000 yards wide constitutes mass. Without obstacles, there is no force in the world which can defend effectively except a hostile mass of other tanks and concealed long-range antitank weapons.

Much has been said and written about Armor, the combined arms team. The use of combined arms enhance the dynamic strength, staying power and shock effect of tanks employed in mass. The infantry cleans out and mops up enemy pockets of resistance and outposts the tanks when halted. The artillery neutralizes hostile antitank weapons, separates infantry from the tanks and disrupts enemy tank formations. Other organic combat and service support units help conserve the tankers stamina and maintain the momentum. Yet, tanks, if required, can fight effectively for short periods without assistance. Such techniques as "scratch my back" with machine gun fire will eliminate hostile infantry who dare to close with the tanks. The much admired gunship may also prove vulnerable to flechette munitions fire by the tanks. Thus, tanks like infantry have a primary role.

As brought out in the article, specific characteristics of the tank will undoubtedly change with technology. However, I believe both its primary combat role and basic configuration of cross-country mobility, effective fire power against personnel and materiel targets, practical protection against enemy weapons, and communications to optimize responsive employment in mass will continue for the foreseeable future, if not indefinitely.

ROBERT M. PARKER
Colonel, USA-Ret.
McLean, Virginia 22101

Dear Sir:

I was both interested and astonished at the lead article "The Death of the Tank."

Interested because it was apparently based on the erroneous concepts that Armor has been combating for 40 years; astonished that you would print something, without rebuttal, that younger readers might easily misconstrue.

The mobile arm, whether based on horses, tanks or helicopters, is simply a better means of achieving a decision through a balance of mobility, firepower, relative invulnerability and self-supportability. Every means of locomotion is deficient in one or more of these elements. Therefore, we need not defend tanks with the emotionalism that horse jumpers and poloists once displayed in defending horses.

But if present trends in tank design continue, the tank is probably doomed. All ignore the principle of *simplicity*. In 1954 or thereabouts, Project STALK was conducted at Camp Irwin to evaluate various tanks. The old World War II *M4* was included to provide a frame of reference. Not surprisingly, it excelled. As a comparatively simple piece of machinery, it could engage a target quickly and accurately, provide inter-tank suppressive fire support, maneuver more easily and be maintained with less trouble, among other things. In 1944-45 combat, an *M4* could not individually face a German *Tiger*, perhaps, but the *Tiger* was no match for two or more cheap, unsophisticated *M4s*, easily assigned to the job.

The bow gunner was a critical member of the crew. He could spray the landscape with .30-caliber machine gun fire, a suppressive effect especially valuable in closing on enemy fixed positions or unarmored enemy vehicles. The size of the crew enabled the vehicle to carry on when one or more casualties were suffered, as all too frequently occurs.

Failure to take these factors into consideration can indeed prove fatal. Even more serious, however, is the apparent idea of the author that the tank is primarily an infantry-support weapon. This is the concept that Liddell Hart, Guderian and Chaffee fought against, successfully at long last. The fight unquestionably hastened Chaffee's death.

Tanks must be used in mass. Employing less than a company in any given assault should give a combat leader the jitters. They are emphatically not jungle- or street-fighting weapons and should be so used only with great reluctance.

As for reversion to the tank-destroyer concept (*Ontos*, or what-have-you), the modern TD enthusiast must be made to recognize the fact that you simply cannot hire men to man an unarmored vehicle, no matter what its armament, and go out seeking tanks to strike and destroy. The real motto is, "Hell no, we won't go!"

Let's get back to simple fundamentals. The Russians have never allowed themselves to become bemused by sophistication that Ivan the Muzhik cannot handle.

All this is not to imply that I do not like the magazine. Your mission is to stir up controversy. "The Death of the Tank" should do this admirably.

WESLEY W. YALE
Colonel, USA-Ret.

Pebble Beach, California 93953

The writer is a former editor of ARMOR. THE EDITOR.

Dear Sir:

Having recently read "The Death of the Tank" by Lieutenant Colonel Lennon, I find the article thought-provoking and needless to say, controversial in many areas.

A couple of the areas have been points of contention for the past twenty-five or more years, i.e., the light tank with a good gun advocates versus the heavy armor crowd. This argument rages even today, and with the advent of a new main battle tank program, we must get down to biting the bullet. God forbid that the tank of the year 2000 shall continue to be a 55-ton monster. . .but I can assure you the need shall exist for a mobile high-velocity weapons system that can close with and destroy the enemy, and at the same time, be capable of occupying and denying terrain to the enemy.

While I must concede that the basic characteristics of a tank have remained virtually unchanged since before World War II, I submit that our new technology has resulted in a wealth of evolutionary improvements in tank design. These improvements have provided a weapons system capable of delivering an extremely accurate and lethal weapon to the decisive point on the dynamic battlefield. The application of the full solution fire control, stabilization and laser rangefinder are but examples of these technological improvements. However, with this ever increasing technology, we find a startling corresponding increase in costs . . . in time as well as money. It is my belief that this facet alone may well become a driving force behind the requirements and the design of the tank of the 1980-2000 time frame.

We in Armor must be prepared for tradeoffs: if we want increased mobility, we must reduce our weight; if we want offensive high-velocity fire power, we must evaluate our extended long range kill requirement; and if we want simplicity, we must be willing to accept a lesser degree of gadgetry and sophistication.

It is essential that all of us keep in mind the basic tenents of Armor doctrine—mobility, fire power and shock action. I cannot agree with Colonel Lennon that the psychological value of the tank is any less today—or will it be tomorrow—than it was during World War II. Massed armor formations may well have passed into history, but rapidly executed armor penetrations and counterattacks will continue to have a powerful psychological affect on the enemy. With the addition of the attack helicopter to Armor's inventory, we have added a new dimension to the battlefield—one that greatly enhances and compliments Armor's mobility.

We in Armor today, more than ever before, must understand and emphasize the basic truth that the tank is the only offensive weapons system that is capable of engaging the enemy in a nose-to-nose slug fest on the dynamic nuclear or mid-intensity battlefield. As Colonel Lennon points out in his article, there will continue to be a valid requirement for a fast, highly mobile, cross-country vehicle capable of delivering accurate high-velocity fire power wherever needed on the battlefield. There can be little doubt that evolving technology during the coming decade will greatly enhance Armor's combat power and will provide a new dimension to ground offensive mobility.

The days of the tank are far from drawing to a close. If confidence in the tank's lethality on the battlefield is waning, one has only to look to the armies of the world and their everlasting search to find the ultimate weapon to defeat the greatest threat. . .the tank.

CHARLES D. COSTON
Lieutenant Colonel, Armor

Fort Knox, Kentucky 40121

Dear Sir:

Lieutenant Colonel Lennon's article on "The Death of the Tank" was one of the most challenging bits ever to appear in our magazine over its long history.

It should give assurance to our readers that *ARMOR* is not necessarily a mouthpiece for the Armor Service but is willing to encourage new ideas. I remember they tried to modernize the old horse Cavalry with special equipment, supported by armored cars, etc. As soon as Armor took over, communications became more sophisticated and everything very complicated. There simply was no place for the horse.

Now this shouldn't happen to the tank, but with helicopters so essentially a part of modern day combat, it will take careful planning to properly relate these new elements in future situations. So let's keep loose in the saddle—receptive to new ideas.

WILLARD A. HOLBROOK JR.
Brigadier General, USA-Ret.

Washington, D.C. 20006

The writer is an honorary vice president of the US Armor Association. THE EDITOR.

Armor Center Commander's Update

MG William R. Desobry

Since assuming my position as Commandant, I have become increasingly concerned about our understanding and appreciation of what Armor really is. Experience with Armor School students has led me to believe that we have experts in air cavalry, armored cavalry, tanks and attack helicopters; but we have very few that appreciate the potential of these four powerful forces when operating together. The following article, which was developed by a member of the Armor School staff and faculty, describes a means of integrating the total Armor force to maximize our true potential. MASSTER and other agencies are, in fact, currently exploring this concept. Armor's arsenal is truly vast. The challenge of today's Armor leader is the appreciation of what Armor has proponency for and the thorough understanding of its characteristics and capabilities. The challenge is yours—do you have the know-how?

MODERN ARMOR

Over the course of the past 30 years, we have witnessed some real doctrinal, materiel and organizational changes within the arm of mounted warfare, which I question whether we in Armor truly understand. Everyone is certainly aware that the armored cavalry regimental formations evolved from World War II because of a need to give the finding and fixing force a greater capability. All are also well aware of the application of the helicopter in the late 1950s and the dimension which this system has added to the finding and fixing force. With the success of the attack helicopter in Vietnam and the development of the Advanced Fire Support System, we have applied yet another measure of effectiveness to the fighting and finishing formations.

The application of new technology has not been limited to Armor. The development of the *TOW* and *Dragon* systems have provided our foot soldiers with a long-range, point target defeating capability. The tremendous strides which the Army has made in airmobility will enable these antitank weapons systems to be moved about the battlefield with ease and rapidity heretofore believed impossible. With the deployment of the *TOW* and *Dragon* systems to our mechanized battalions, we should achieve a magnitude of improvement in our tank-defeating capabilities.

Many would even suggest that these increased capabilities tend to negate the Army's requirement for armor-protected firepower . . . specifically the tank. Within a truly defensive environment perhaps such a case could be made, since ground mounted *TOWs* and *Dragons* are purely defensive antitank systems. They do not possess the armor-protection necessary to withstand the enemy's indirect or smaller caliber direct fires, nor do they appear capable at this time of delivering accurate fires while maneuvering to close with and destroy the enemy. Therefore, the tank cannot be challenged in its role as the Army's primary offensive weapon system.

Although the basic characteristics of the tank have remained virtually unchanged since World War II, new technology has resulted in a series of evolutionary improvements in tank design. These changes have provided a weapon system capable of moving an extremely accurate and lethal weapon to the decisive point on the dynamic battlefield. The application of a full solution fire control and stabilization system are but examples of the progress that has been made. Collectively, the improvements have increased Armor's combat power and, in fact, have provided a greatly expanded dimension of ground offensive mobility. The days of the tank are far from drawing to a close. If confidence in the tank is waning, one needs only to review the tank development programs of both our potential adversaries and our allies.

Considering this improved technology, one may ask what has changed in the application of the assets of Armor? Armor today contains all the ingredients to find . . . fix . . . fight . . . and finish an adversary. I believe, however, that there are too many of us in Armor who neither understand nor appreciate the interface between Armor organizations. Integration of all elements of Armor into a coordinated fighting force will provide commanders with capabilities to find, fix, fight and finish, which are unsurpassed in modern warfare.

FINDING

For purpose of illustration, I will start with the finding function. The finding force commander has benefited in two significant ways from evolving technology—increased mobility and reduced reaction time. Air cavalry formations provide a quantum improvement in mobility over the ground cavalry units. This mobility increase, in turn, reduced reaction time which equates to resources saved or enemy killed. In developing air cavalry, we have traded off primarily armor protection and the ability to physically occupy ground.

Unfortunately, we are emerging from a war where these characteristics were not of prime importance; hence, we tended to think that the air cavalry could do it all. We must acknowledge that in a conventional warfare environment, a higher degree of armor protection and the classic occupation of ground will be vital to mission accomplishment. Consequently, the finding forces must be integrated to allow optimization of the capabilities of air and ground cavalry to provide the commander a multiplicity of options—again, a function of mobility and reaction. In those instances where a marriage of air and ground cavalry occurred, such as that frequently found within the structure of the 11th Armored Cavalry Regiment after 1968, this combination was unbeatable.

FIXING

If our fixing forces are to be successful in the mid-intensity environment against a numerically superior foe, they also must have a total integration of the ground and air assets. Take a situation in Europe where an enemy threat or penetration has occurred against a lightly defended area. The immediate task will be to provide a force which can identify (which probably won't be difficult), slow and contain the enemy threat. Air cavalry forces, by virtue of their mobility, provide the commander reduced reaction time and the capability of quickly finding and assisting in the fixing of enemy forces. The commander must not, however, rely solely on the air cavalry to accomplish the fixing mission. They simply cannot do it. For most situations, and pending the availability of troops, the commander would in all probability reinforce with more ground cavalry followed by tank or mechanized heavy task forces.

Visualization of this concept might well portray a ground cavalry force that had been covering an unlikely avenue of approach and has, in fact, been threatened or penetrated by a sizable force. The immediate problem to the larger force commander is to determine the nature of the threat and to slow or fix their advance to permit the application of a suitable counterattack force. The ground cavalry force commander's problem is to maximize the use of his ground mobile assets to detect, identify and inflict maximum damage, thereby forcing the enemy to deploy, thus trading space for time or space for force attrition. Previously the ground cavalry has had but one dimension to work in to accomplish these tasks and in all probability he would have been forced to fight and delay from his initially selected positions.

Given organic air cavalry to assist him, he has gained two extremely important advantages. By virtue of this additional dimension on the battlefield, the cavalryman can now "see over the ridge." Secondly, and perhaps of even greater significance, is that the enemy's attention has been diverted. No longer can the enemy focus solely on the ground force, but rather his attention must also be directed to the "pop up" helicopter, which not only observes, but can deliver the same lethal munitions as the light armor vehicles.

As air cavalry units will maneuver about the battlefield within the protection and concealment of the ground environment, the enemy can no longer be oriented solely to the front, but must, in fact, protect against attacks from the flank and rear as well. Although other means of aerial surveillance and aerial delivered fires were available in the past, now for the first time, the ground or air cavalry commander has all of these capabilities in a maneuver element directly under his control. In summary, the union of these two cavalry elements, together with artillery and

tactical air, will compound the enemy's problem, reduce the vulnerability of our forces, and thereby increase Armor's effectiveness.

To the larger force commander the threat of, or an actual enemy penetration will in all probability require the shifting of sufficient armor-defeating forces to the nose or flank of the penetration to slow and attempt to canalize the enemy until adequate forces can be massed. Normally this entails the movement of tank or mechanized heavy task forces from some other battlefield location. History is replete with classic examples of the movement of armored formations to counter enemy threats. Inherent in all of them, however, is the element of time. The success of the enemy force, the losses to our fixing forces, and the probability of success of our counterattacking forces are to a large degree a function of time. In our business, time is dependent upon mobility.

For purposes of illustration let's return to the situation described above. By providing the ground cavalry force commander with air cavalry, we have increased his total effectiveness in terms of providing full dimensional reconnaissance (aeroscout platoon), highly mobile *TOW* firing platforms (weapons platoon), and airmobile infantry *TOW* or *Dragon* firing teams (aerorifle platoon) that can be selectively positioned. Of equal importance, we have given the ground cavalry a clearer picture of the situation. With this information the ground cavalry can now maximize its armor-protected firepower at the decisive point.

To the larger force commander, this increased reconnaissance capability also facilitates precision in the application of his forces. From pre-selected firing positions, the force commander may elect to reinforce the security force with airmobile infantry *TOW* or *Dragon* antitank teams. Although lacking armor protection, and being purely defensive in nature, the long-range capability of these weapons systems and their ability to rapidly displace to and from firing positions provides the commander with yet another means of buying time until he can commit the appropriate offensive power.

In concert with the positioning of these long-range weapons, the force commander would, in all probability, elect to seed the likely avenues of approach with air and ground delivered scatterable mines, thereby forcing the advancing formations into attrition zones of his choosing.

Today's Armor commander also has the option of reinforcing with attack helicopters. The initial employment of these attack helicopters would in all probability be accomplished in coordination with the air cavalry reconnaissance force in an economy of force role. The air cavalry would select primary and alternate firing positions which would complement the organic fires of the ground cavalry, airmobile antitank teams, tactical air and artillery. The control of all of these forces could be vested in either the ground or air cavalry commander.

The addition of air cavalry to the Armor family has provided us with tremendous strides in mobility. This is not to suggest that air formations have or ever will replace our conventional ground mobile forces. However, by virtue of their mobility they do fill a critical void between the application of a fixing force and the arrival of the fighting forces.

FIGHTING AND FINISHING

Thus far we have addressed primarily the role of the finding and fixing force, and the impact of our evolving technology upon these reconnaissance formations. No less has been the impact upon our fighting and finishing forces. In addition to the air cavalry attack helicopter, Armor has added a new concept to tank warfare—the missile firing tank. Although the *M551 General Sheridan* has a missile firing capability, it is not a tank because it lacks the armor protection to survive in modern warfare. With the recent type classified *M60A2* tank we have generally the same mobility and armor protection as the *M60* series tank, while concurrently increasing our long-range antitank defensive capabilities.

Again, for purposes of illustration, let's return to our scenario. With the information that the security force has been able to provide, the larger force commander, as stated earlier, would in all probability initially launch his counterattack by employing attack helicopters. This has closed the mobility or time gap that would normally be attendant to shifting forces or committing the reserve. It is important to understand that these attack helicopter assaults are sustained and not piecemealed by sortie. The attack helicopter, although incapable of holding ground, possesses a degree of shock effect similar to the tank. It also permits the application of continuous pressure on the enemy while the ground forces maneuver to close with and destroy the enemy. As quickly as possible, the ground commander would commit his tank heavy forces. Ground and air cavalry forces provide the tank force commander with all-around security and detailed infor-

mation on routes and enemy activity. As this counterattack force nears the line of departure, final coordination is made with the ground cavalry and the attack helicopter force and control passes to the tank force commander.

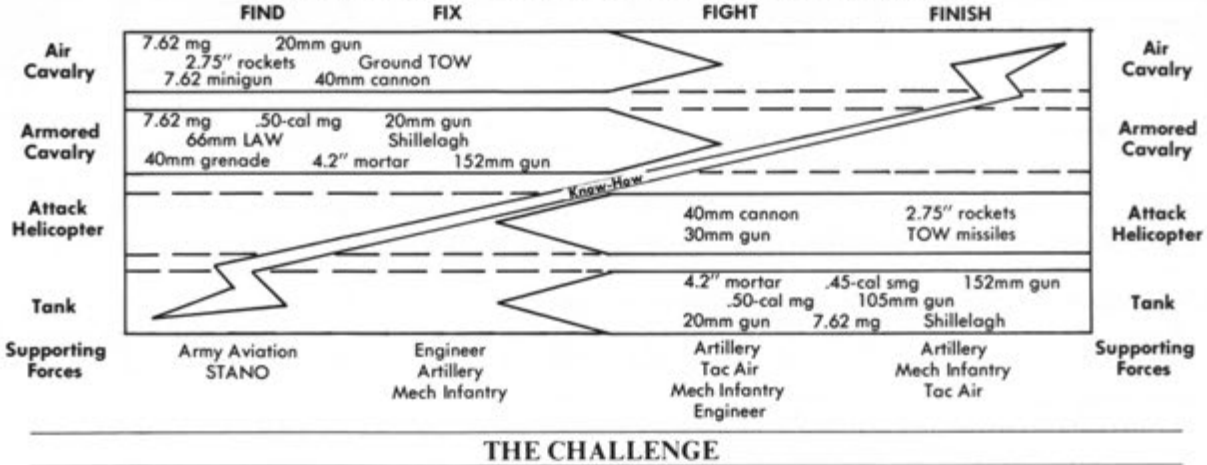
The symphony is assembled and awaits orchestration. Tactical air, if available, and artillery attack pre-designated targets; the ground and air cavalry forces screen and protect; the *M60A2* tanks assume positions to deliver long-range overwatching fires; the combat engineers assist in the movement of the tank formations; and the attack helicopters complement the fires of the attacking team of tanks and mechanized infantry.

Telescoping the action to the tank platoon or even the company level, it is not inconceivable in the fighting and finishing phase of the conflict to see tanks and helicopters literally working side by side while supported by artillery and tactical air. The tank derives its staying power through shock effect, armor protection and mobility, while the helicopter survives by virtue of its tremendous mobility and highly accurate weapons. Just as the scout helicopter provides the ground commander with capability of seeing over the ridge, the attack helicopter provides the commander with the capability of firing over the ridge with direct, point and area target weapons systems.

Thus far we have discussed the truly complementary nature of the air cavalry reconnaissance and attack helicopters to their companion ground formations. The benefits derived have been fundamentally achieved by virtue of their tremendous mobility. There is another side of this complementary coin which relates to sustained maneuver as opposed to mere mobility. In the preceeding scenarios I have attempted to portray how the air cavalry forces can assist the commander in not only increasing his functional capability, e.g., improved reconnaissance and security, but more importantly how these forces provide the commander with a near real time capability.

In order for the fighting and finishing forces to be employed successfully, it is essential that superior power and maneuverability over the enemy be present. The less mobile force will be outmaneuvered and outfought. True—the helicopter provides us with the speed aspect of mobility and can deliver selective long-range fires. It does not, however, provide us with the capability of sustained maneuver that is inherent in the tank and is a characteristic of conventional armor formations. Simply stated, sustained maneuver equates to armor-protected, highly mobile firepower. Without these complementary forces, the armada of air cavalry formations will be relegated to special mission operations. When operating in concert with the Armor family, the derived benefits can be limited only to the imagination of the commander.

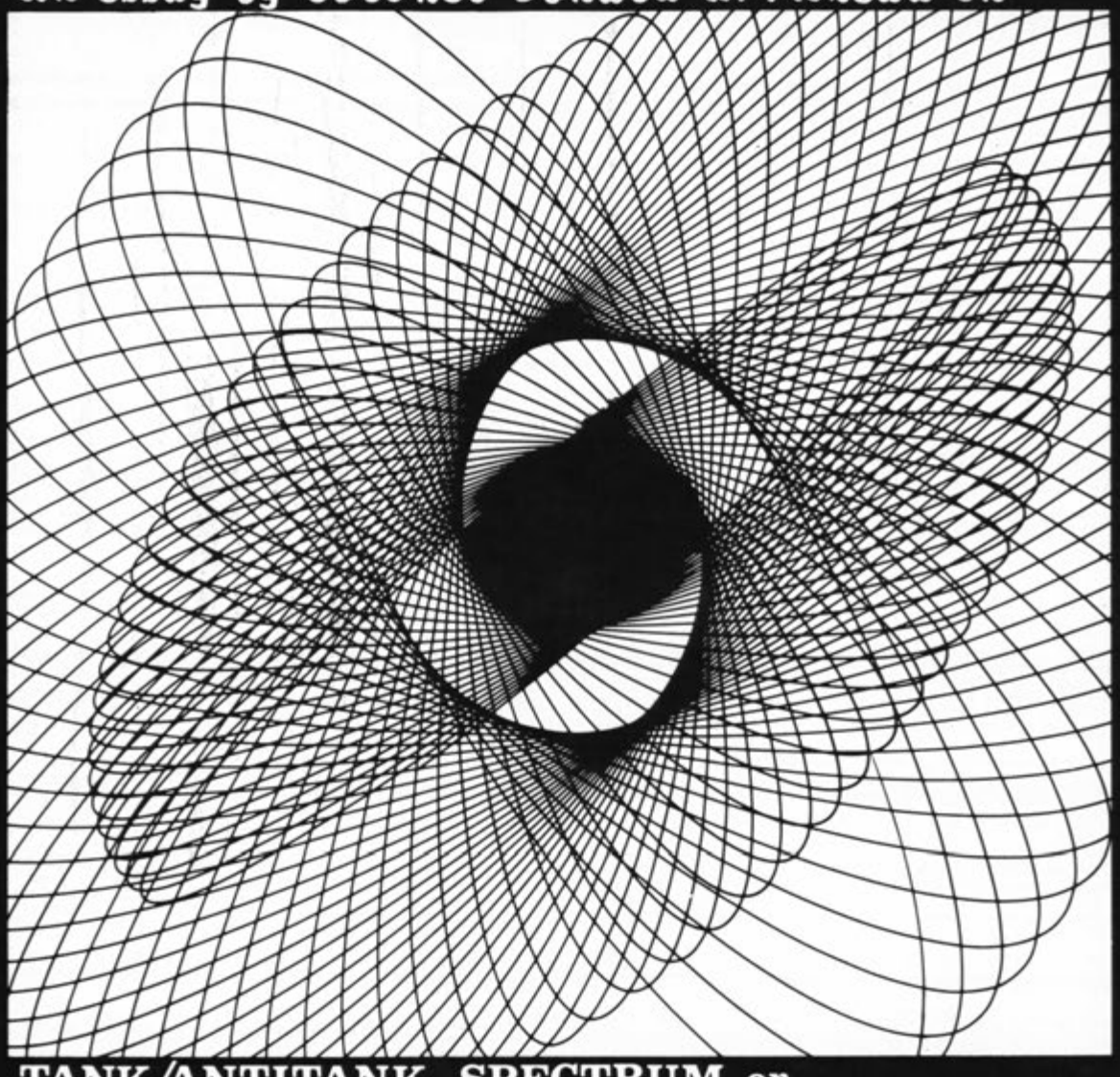
Employment of Armor Forces in the Mid-Intensity Environment



THE CHALLENGE

Air cavalry reconnaissance and attack helicopter units belong to Armor and are designed to complement our Sunday punch—the main battle tank formations. Together they provide Armor the means to fulfill virtually all of the functions of combat. As our experience in Vietnam proved, the dependency of any one force upon the other was essentially a measure of the intensity of the conflict. From this experience it should not be difficult to visualize the multiplicity of combinations that can be derived to tailor a force for a particular level of conflict or environment. Neither should it be difficult to visualize the tremendous combat power that evolves when all four forces are working together. The challenge to Armor leaders today is to possess the knowledge that will enable us to fully employ this tremendous fighting force, which is MODERN ARMOR.

An essay by Colonel Donald W. Moreau on



TANK/ANTITANK SPECTRUM or MOBILE WARFARE

The spirit may be willing but the flesh is dormant. This phenomena appears quite appropriate for Armor. We seem to understand the role of Armor but cannot articulate its function in terms of tank/antitank warfare.

For years the Armor community has epoused—possibly over propagandized—that Armor was not a tank or a mechanized replacement for the horse but rather a skillful blend of infantry, artillery, tanks, cavalrymen and other arms and services. This philosophy had a high degree of credibility after World War II but has gradually lapsed into a morass of branch parochialism—particularly the Armor, Infantry and Artillery communities. The goal appears to be how to accommodate parts of the puzzle rather than assemble the parts into one discernible picture.

One could spend countless hours arguing the validity of the above statement and no doubt, depending on your particular branch, you could show why your branch was not a guilty party. In my opinion, this has been accomplished by all parties throughout our system with great finesse and subtlety. And in the final analysis, the result has been the lack of a specific defined tank/antitank philosophy. What we do not have is one approach to future mobile warfare.

The Armor community is fighting for the AMBT,

the Armored Reconnaissance Scout Vehicle, the Bushmaster, a follow-on to the *M551*, an integrated family of ammunition, and countless other requirements—all focused on dominance of the future battlefield.

The Infantry community is fighting for the Mechanized Infantry Combat Vehicle, MICV w/ *TOW, TOW, Dragon*, new small arms, and countless other requirements—equally focused to dominate the future battlefield.

The Artillery community is fighting for new howitzers and guns, automated fire control systems, simplified survey, and ammunitions capable of delivering a variety of kill mechanisms—not to dominate the future battlefield, but to capture a share of the dominance.

The aviation community, with support from Armor, Artillery and Infantry, is fighting for a wide range of highly sophisticated and exotically armed aerial platforms capable of adding to the lethality against an armor threat. Based on the current arrangement of proponency—everyone having a share of the pie—this level of dominance is more subtle but is, in fact, competing for a chunk of the pie.

When we raise the level of participation, we find some analysts depicting graphically that *TOW* provides the real cost effective way to negate the potential armor threat. They ignore the fact that the missile may require an unusual set of circumstances to insure attainment of the analytically derived kill probabilities.

Others argue that the protected, missile-equipped *M60A2* is the route to pursue. These analysts make a significant case for missile accuracy and lethality at the longer ranges. They emphasize the survivability and mobility criteria, and while doing this, these same analysts conveniently ignore the impact of time in flight for the missile or lack of targets at extended ranges. Also not addressed is the lack of a kinetic energy round for the shorter range engagements.

Other analysts point out that the artillery potential is such that we could meet the threat with more artillery and less direct fire systems, and these analysts can also mathematically produce some quite convincing graphs and statistics to "prove" their point.

One could expand this issue to any system competing for its share of battlefield, and on the surface provide quite convincing rationale that it offers to be the light at the end of the tunnel. The latest competitor, the *Cheyenne*, and its forebearer, the *Cobra*, are the current contenders being touted as the answer to the armor threat. But what compounds the problem is that anyone, community or analyst, could be more correct than another. Yet, it is impossible to sort out these data to identify which is the more correct position.

Basically the problem is how do we determine just what is the best arrangement of assets necessary to conduct modern mobile warfare? Can we assume that any one system is actually the panacea or do we return to the old philosophy of blending? Can we afford the constant Congressional criticism of "what do you want—you cannot have everything?"

It appears that the Army community should never talk about nor address one system by itself. Rather, we should only address mobile warfare and its collective requirements. I will be accused of heresy because it can be adequately shown that TATAWS, ATMIX, Legal Mix IV, and the myriad of other study efforts do, in fact, address companion systems, but the fact remains that in each effort there is a dominant system. Plus, in each case previously mentioned, each companion system played is primarily associated with effects rather than with direct relationship. For example, and I contend this is not occurring in our current approach, in any battle all elements within a force interact with one another. The artillery assumes an early dominant role in that it can bring its fires to bear on enemy forces at ranges beyond the ground direct fires and so commences attrition early in the game. Likewise aerial platforms with various weapon mixes may be employed early in a battle to insure a higher rate of attrition than could be accomplished by the artillery alone. These fires must be evaluated and effects considered as a distinct part of the battle. This applies regardless of the type tactical situation—defense or offense. As the battle closes within direct fire ranges, the rate and volume of fires becomes a combination of all weapon systems each contributing to the destruction.

The contributions of all these weapon systems must be evaluated and the effects considered. Since each of the current weapon systems is not infallible, one must realistically degrade each system in relationship to the actions of the enemy. It is reasonable to assume that the enemy could, during any battle, reduce the effectiveness of *TOW* by heavy concentrations of artillery, using smoke, VT, or just plain HE to degrade the potential hit/kill probabilities. He may, in fact, only force a shifting of firing locations but this equates either way to the degradation of its capability. The enemy may attempt maneuvers which force battles at shorter ranges to minimize the missile threat, and in doing so, accept tank duels.

Cheyenne

Dragon

One must ask what will the impact be on our battle scheme, and do we have the systems to handle this type of maneuver?

History supports rather conclusively that an aggressive force would react to any enemy threat tit-for-tat and apply force to negate the enemy's advantage. Then assuming the enemy can apply a variety of techniques, what is available to our force to counter his moves? Do we have the right mix of tricks? Have we bought off on the right blend of weapon systems? Are we overequipped in some areas and underequipped in others? What is the relationship between our various kill mechanisms?

Do we have the right kinds of ammunition for the Artillery? What will the impact of Artillery be when they can effectively seed scatterable mines? Should we not emphasize the development of artillery rounds which could offer a high probability of a mobility kill to improve the probability of our obtaining a high hit/kill probability with our direct fire systems?

What about the time of flight problem with the missile—can the enemy evade the missile at the longer ranges? What effective countermeasures can the enemy employ and to what degree? If he can degrade the missile, what is its role in terms of a total battlefield spectrum?

Do we have the other mixes to offset degraded hit/kill probabilities? Can the mixed-bag tank with its attendant missile characteristics provide the right amount of hit/kill potential to thwart the enemy? Does its mobility and survivability give it an edge?

One could take off endlessly with questions but the real issue is not what one weapon system can do or cannot do, but whether we have the right mix of kill mechanisms for a given force which insures a high probability for success against an enemy force.

Back to the first point—we should take positive steps to address mobile warfare as a whole. Look at the entire spectrum as an entity and develop appropriate materiel requirements, organizations and doctrine. By doing so, clearly relate the relationships of each participant one to another; particularly the role each is to play and to show clearly these relationships against a variety of enemy threats.

Now, how can this be accomplished? *First, it appears timely for the Army community to develop a philosophy for mobile warfare which insures a one system approach*—treat all parts systematically rather than treat each piece of hardware as a system. If one starts at the top and works down, it is impossible to discover exactly what the Army is planning for mobile warfare. Bits and pieces appear, such as air cavalry squadrons, aerial artillery battalions, attack helicopter squadrons, an Air Cavalry Combat Brigade and a TRICAP Division; yet these are only parts. Where is the overall guidance?

Some will say that Conceptual Design for the Army-in-the-Field (CONAF) will provide all the answers—it is designed to look at the whole, but where is the philosophy behind this effort? Is this effort going to sort out the interrelationships between and among competing elements or is it going to compound problems by elevating the existing data to a less definitive level? Are we going to know where each tool fits in the scenario or are we going to quantify effects, and by doing so, raise the problem to a higher order of magnitude without ever addressing the true value of each competing system one to another?

One could make a case that warfare is too disorderly to provide real quantified data, and I would agree in part. However, if a single philosophy approach is taken then new opportunities exist for the Army to blend military judgment with quantifiable data. But it goes without saying that until mobile warfare is defined and responsibilities fixed, the opportunity to blend these two factors will be vexed by the current approach—bits and pieces.

Second, and this is predicated on looking at all of the parts based on a single philosophy—reduce the bureaucracy and then give the workers the right people and tools to get the job done. This appears drastic but the stage has been set. Headquarters, Combat Developments Command has engaged in a new concept of operations which looks like a wedge in a very tight door. They are formulating what they refer to as Commanding General Guidance Memorandums (CGGM). The first product was the Integrated Battlefield Control System (IBCS). It looks good and establishes a one system approach to a highly complex problem area. However, it is my opinion that its worth is based on the DA effort called the Army Tactical Command and Control Master Plan (ATACCOMAP). This DA document acts as the driver—the coordinator—the discipliner.

M60A2

Its real value is that it sets forth guidance for all major commands and clearly defines the route desired by the Chief of Staff.

The next CDC step is to address tank/antitank warfare, but unfortunately this new CGGM is not being driven by DA but rather is a CDC effort to address the vexing problem of a one philosophy approach. Since the current effort will not enjoy DA direction, it will suffer from a lack of directed interaction between the DA major subordinate commands. As a result, the bureaucracy is not reduced but rather remains layered. I should point out that I am not using the phrase "reduce the bureaucracy" to infer a reorganization, but rather to reduce the individual manipulations associated with programs not enjoying positive DA guidance. If the guidance is clear, strong and supported, then it follows that the number of manipulators, or possibly a better name is interpreters, can be reduced. Once this occurs, then there should be adequate personnel to staff the working levels—the real combat developers.

Third, reduce gyrations—settle on an overall philosophy, give the field time to sort it out, develop well thought-out and integrated programs, then subject each program to a critical analysis by a DA senior general review board. At this point, based on changes to the program, lock it in and permit no major machinations unless authorized by the senior general review board. This by itself might appear drastic but in actuality would maximize effort and minimize personal influence along the route. It would force a degree of integration in that command deviations, slippages or inconsistencies, would surface during the analysis and approval stage. This approach is not novel—it is in being and has proven its worth. The IBCS Program is directed from the top and all subordinate commands are integrated and efforts reviewed by a DA senior general review board. So the precedent is in being, but now needs to be extended to other programs. The tank/antitank, or more precisely titled: mobile warfare, is a logical contender. One has to recognize that programs which enjoy DA intimate sponsorship enjoy a high probability of success.

Finally, if we are going to advance rapidly to vitalize the future Army, then the time appears ripe to:

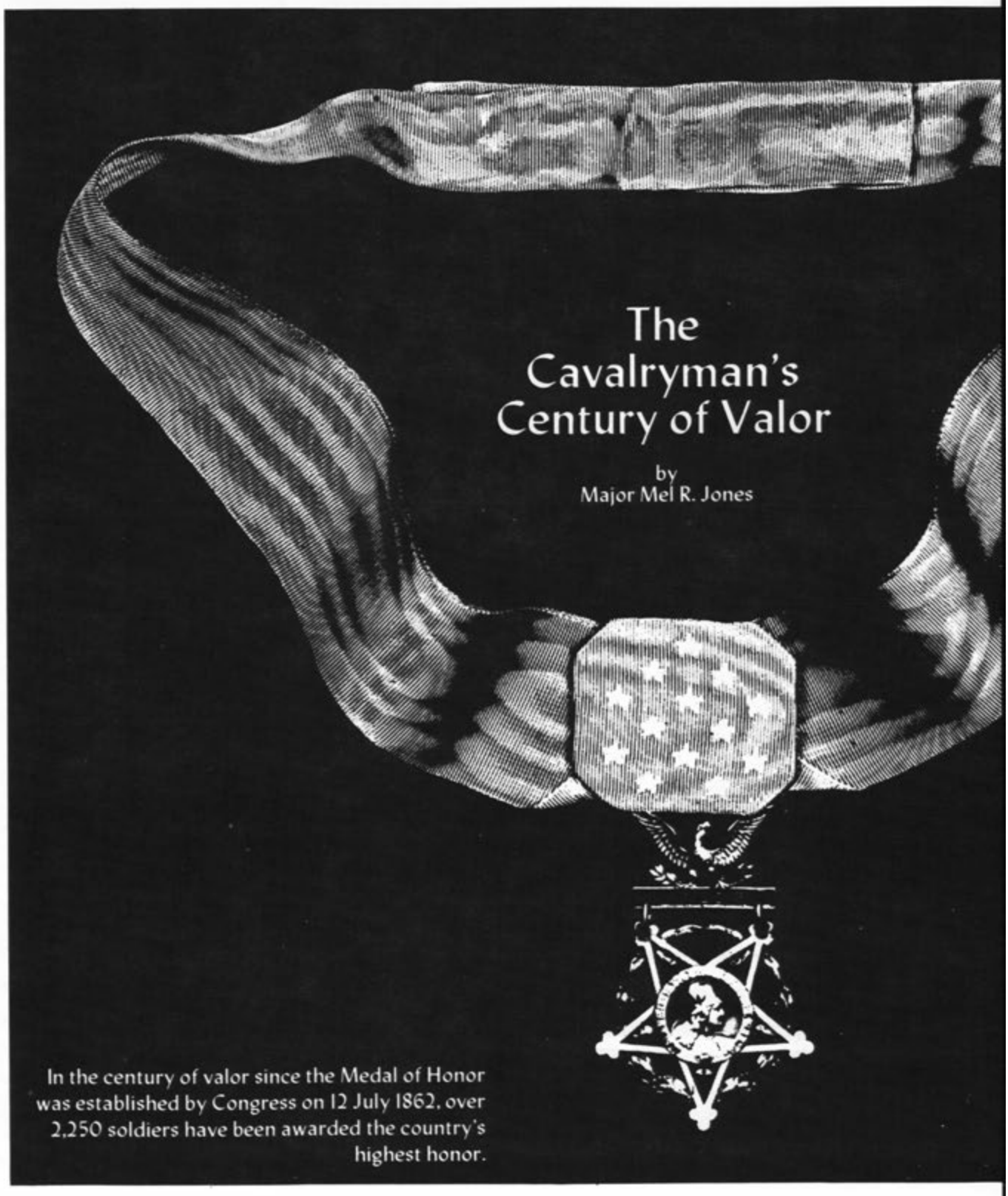
TOW

- Develop an integrated program approach to critical problem areas.
- Define in broad terms the program philosophy.
- Produce Program Master Plans to direct and control integration.
- Reduce superstructures and reinforce the working elements.
- Reduce personal gyrations and program manipulations.
- Retain the total integration responsibility at DA.

In conclusion, I would add one more consideration. Once a year permit the major policy makers (one horse holder per general) to move into splendid isolation, a retreat, to let them review the major programs, and with full knowledge of factors influencing the Army to revise the programs. In fact, what should come from this is program "white papers" guidance. This might stave off all the false starts and stops and build into our programming a degree of stability. If nothing else occurred it would give this group time to review the bidding and take a look at where the Army is going without being pressured by the day-to-day issues.

What I have tried to support, using tank/antitank warfare, is that we have some gutty problems—but they can be sorted out by strong guidance and leadership from DA.

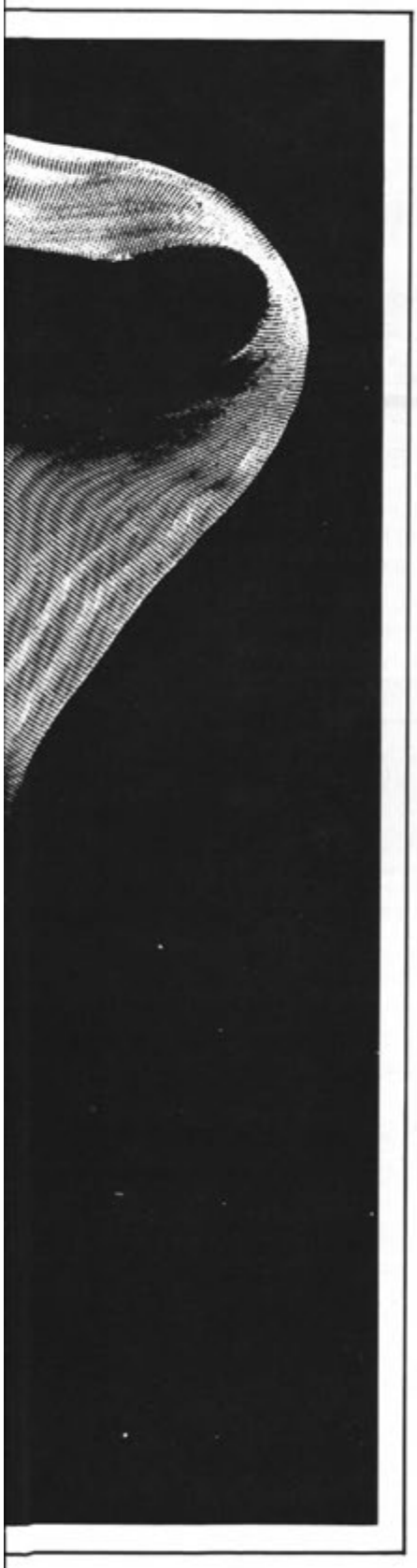
COLONEL DONALD W. MOREAU, after serving with the Navy during World War II, changed his branch of service and received a direct commission in Armor in 1948. A graduate of the University of Maryland and the Command and Staff College, Colonel Moreau served as commanding officer of the 2d Squadron, 1st Cavalry, 4th Infantry Division in Vietnam. He is currently the deputy commanding officer at the US Army Combat Developments Command, Armor Agency at Fort Knox.



The Cavalryman's Century of Valor

by
Major Mel R. Jones

In the century of valor since the Medal of Honor was established by Congress on 12 July 1862, over 2,250 soldiers have been awarded the country's highest honor.



More than 100 years ago, a 22-man raiding party slipped behind Confederate lines. They traveled undetected for 200 miles, captured an entire supply train and, by blowing up bridges behind them, nearly cut off the whole state of Tennessee.

Six of these raiders were honored on 25 March 1863 as the Army's first recipients of the Medal of Honor.

In the century of valor since the Medal of Honor was established by Congress on 12 July 1862, another 2,267 soldiers have joined these first six at the top of the pyramid of honor.

Any Medalist will tell you that the road to the summit of heroism is paved with the risk of life above and beyond the call of duty. It is a lonely pathway traveled by those few men who have demonstrated extraordinary heroism in actual conflict with an enemy and accomplished an act conspicuous because of its gallantry and intrepidity, an act deemed worthy of the nation's highest devotion.

Counted among those who have reached this pinnacle of precedence is the US Cavalryman who, whether afoot, mounted on horseback, tank tread, or heli-borne, has carved out a piece of the action and won fame and respect for himself and his combat arm.

From the Civil War to Vietnam, men like First Lieutenant James B. Pond, Company C, 3d Wisconsin Cavalry, stood as tall in the hearts of their comrades as they did in the saddle.

Lieutenant Pond's citation is not annotated. But we can imagine that his command was at stand-down, encamped at Baxter Springs, Kansas, in October 1863, when it was attacked by guerrillas. Perhaps the two companies of cavalry troopers huddled by their camp fires made an inviting target for the guerrillas who had them outnumbered and the element of surprise in their favor. The attack came swiftly and savagely, but Lieutenant Pond gallantly rallied his men, and after a severe struggle, drove the enemy outside the fortifications. Not content with merely driving them back, Pond pursued them and alone and unaided, fired a howitzer three times, throwing the enemy into confusion and causing him to retire. Pond was not the last cavalryman to combine manueverability and firepower to route a determined foe.

Another Lieutenant, Thomas Cruse of the 6th

US Cavalry, was among the 100,000 soldiers who participated in the Indian Wars, fought between 1817 and 1898. In these wars, the vast majority of the participants were cavalrymen because the hit-and-run tactics of the Indians and the nature of the southwestern terrain fit the light cavalry's versatile mission of offensive combat, pursuit, exploitation of a breakthrough, reconnaissance and security of other arms.

Lieutenant Cruse may have been on wagon train escort duty or part of a security force for other arms at Big Dry Fork, Arizona, in July 1882, when he won the Medal of Honor. His citation indicates that he understood well the principle of fire-and-maneuver as he gallantly charged hostile Indians, and with his carbine compelled a party of them to keep under cover of their breastworks while he recovered a severely wounded soldier.

Six years earlier, the heroic deeds of 7th US Cavalry troopers like Corporal Charles Cunningham and Sergeants Benjamin C. Criswell and Richard P. Hanley were overshadowed in the controversy surrounding the stand at Little Big Horn River, Montana, on 25 June 1876.

General Custer's failures and Major Reno's intrigues still capture the historical headlines of the battle. Yet it was cavalrymen helping to preserve the strength of the beleaguered troops while thwarting a determined enemy, who deserve more attention than they have received by many historians. Hanley won his Medal of Honor posthumously for a single-handed charge into enemy lines under a hail of bullets to recapture a stampeded pack mule loaded with ammunition. There was no more precious commodity at the Little Big Horn River that day than ammunition, and Sergeant Criswell, like Hanley, realized it too. Criswell brought up ammunition and encouraged the men in the most exposed positions under heavy fire. Earlier he had alone assaulted Sitting Bull's lines under a fusillade of bullets and arrows and rescued the body of one of his officers.

Corporal Cunningham was no doubt a beneficiary of the two sergeants' dash for ammunition that day. He was able to hold out for two days and was cited for bravery when he declined to leave the line, although wounded in the neck during heavy fire, and bravely fought the next day.

The battle was lost at Little Big Horn River, but the cavalryman gained new respect in the eyes of friend and foe who marveled at his tenacious fighting spirit against tremendous odds. Songs and legends sprang up across the west like prairie fire, and soon the whole nation was praising the gallant deeds of "Gary Owen."

Men like Mississippian John W. Herd added to the legends and upheld the tradition of the cavalryman throughout the Spanish-American War, which erupted in 1898 and was brought to a close in 1902. Lieutenant Herd, of the 3rd US Cavalry, found himself on a gunboat in Cuba during this war fought on foreign shores and dominated by naval action.

The Wanderer was making its way up the Manimani River with Lieutenant Herd on board when it came under attack from the shoreline. In the first moments of battle, two naval crewmen piloting the gunboat were cut down by Spanish gunfire. Herd earned the Medal of Honor when he dashed to the pilothouse, assumed the positions of the two crewmen and personally transmitted the orders, remaining at his post until the ship was out of danger.

By the closing years of the war with Spain, the great naval battles dwindled to skirmishes ashore with the Filipinos, who had assumed that an American promise of freedom for Cuba meant freedom for the Phillipines as well. Driven from their trenches around Manila, the natives took to the hills where perilous jungle fighting greeted the Army and Marine forces sent in to root them out.

A shortage of firearms and ammunition among the insurgents forced them to use primarily uncon-

ventional tactics, and the Army found itself drawing upon its long experience in fighting the western Indians in order to cope with these guerrilla operations.

The terrain was not fit for mounted troops, but the fierce fighting was something cavalrymen like Captain Hugh J. McGrath and Lieutenant Archie Miller could sink their spurs into.

Captain McGrath won the Medal of Honor early in the campaign in July 1899, when he swam the San Juan River in the face of the enemy's fire and drove him from his entrenchments.

Although the complete suppression of the insurrection was formally announced by the government in 1901, Lieutenant Miller was among the "10 per cent" who did not get the word until July 1909. On that day, this 6th Cavalry officer earned the Medal as he fought for his life at Patian Island in the Phillipines. He and his machine gun detachment had been driven back by Moros. One man was killed in the withdrawal and the crew's machine gun damaged. Lieutenant Miller, with the assistance of an enlisted man, placed the machine gun in advance of its former position, 20 yards from the charging Moros, spliced a piece of timber to the damaged tripod and blasted away while enemy bullets slammed into the makeshift legs of the machine gun.

The period that immediately followed the Phillipine Insurrection is characterized by historians as a time of transition and change for the American nation. From 1902 to 1917, the Army fought no major battles in which the Medal of Honor was awarded.

By 1917, the sinking of American ships by German submarines and the fear that Germany and its allies would rule the Atlantic and the Western Hemisphere, hastened America's entry into war. The country was more psychologically prepared for war than it was physically prepared. President Wilson struck a responsive chord in the minds of the men who would fight the battles with his declaration, "we entered the war as disinterested champions of right" so that the world can "be made safe for democracy." But the fact remained that the Army was hardly in shape to back up these idealistic pledges.

Its embryonic US Tank Corps used tanks borrowed from the French and British and bore little resemblance, except in spirit, to its proud forbears, the US Cavalry. Yet it was that inherited spirit, coupled with the new wave of idealism, that led men to the pinnacle of bravery at the risk of their own lives to save their comrades in a war some considered too impersonal for personal acts of courage.

Corporals Harold W. Roberts and Donald M. Call, both of the 344th Battalion, Tank Corps, were two such men.

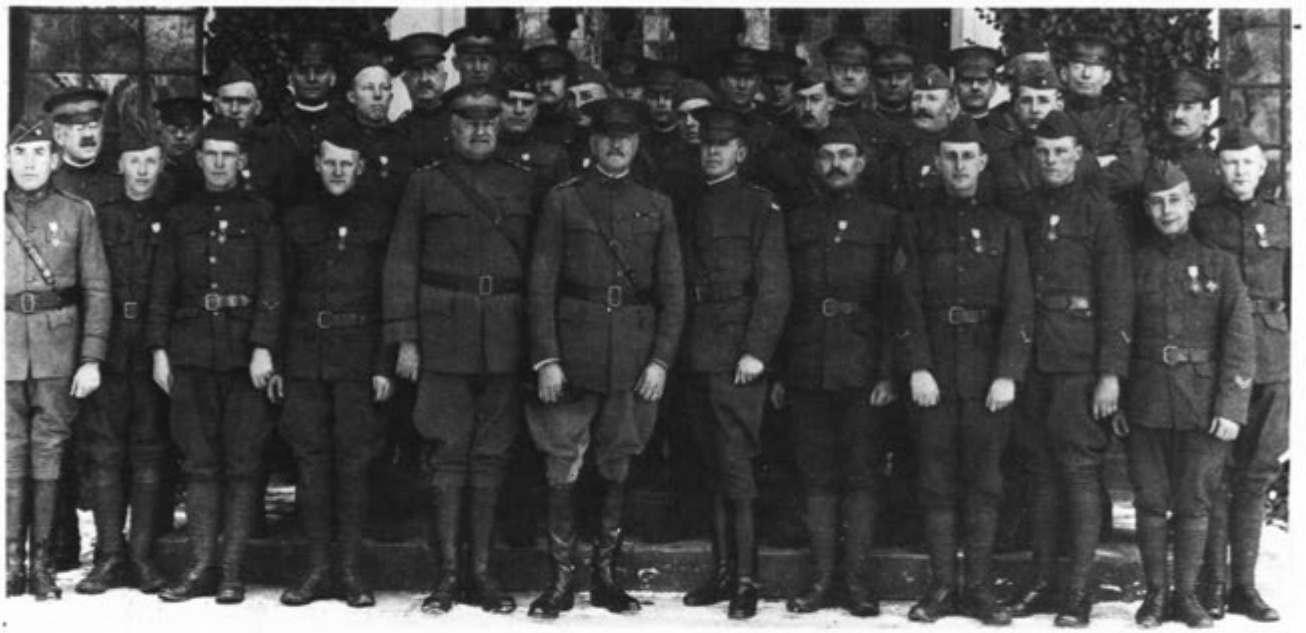
Corporal Roberts, a tank driver, was moving his tank into a clump of bushes to afford protection to another tank which had become disabled. His tank slid into a shell hole, 10 feet deep, filled with water, and was immediately submerged. Knowing that only one of the two men in the tank could escape, Corporal Roberts said to the gunner, "Well, only one of us can get out, and out you go," whereupon he pushed his companion through the back door of the tank and was himself drowned.

Corporal Call received his Medal of Honor for heroic action in France where the 344th was conducting operations against enemy machine gun nests west of Varennes. Corporal Call was in a tank with an officer when half of the turret was knocked off by a direct artillery hit. Choked by gas from the high-explosive shell, he left the tank and took cover in a shell hole 30 yards away. Seeing that the officer did not follow, and thinking that he might be alive,

Corporal Call returned to the tank under intensive machine gun and shell fire and carried the officer over a mile under machine gun and sniper fire to safety.

Close on the heels of World War I, there followed another type of world-wide disaster—the Great Depression, which many believed to be the catalyst that plunged nations into global warfare for the second time in less than half a century.

An Austrian house painter saw in the confusion produced by the Depression, Germany's opportunity



Winners of the Medal of Honor and others with General John J. Pershing at his chateau in France.

to rearm in order to recapture lost prestige and territory. When Hitler boasted in 1939, "God has made me Fuehrer and ruler of every man and woman of German blood in every country on earth," most Americans knew that war was imminent. Again there would be a time for heroes like Captain James M. Burt to come forward.

Captain Burt commanded Company B, 66th Armored Regiment, 2d Armored Division near Wurselen, Germany, on 13 October 1944. His unit was part of a coordinated infantry-tank attack destined to isolate the large German garrison defending the city of Aachen. The infantrymen ran into murderous small arms and mortar fire early in the action. Captain Burt dismounted and moved on foot beyond the infantry positions, and in the midst of a hail of bullets, calmly motioned his tanks into good firing positions. For ten days Burt charged in and out of enemy lines rescuing wounded, directing his tanks and the artillery fire. He was painfully wounded in the neck and face on the first day and had two tanks shot out from under him before the battle ended. He had dominated and controlled the critical situation through his sheer example, and the victory achieved closed the Aachen gap.

The smouldering ashes of World War II rekindled in many parts of the world when communist animosities reached the armed threat stage in 1950. President Truman vowed to halt the Red flame, and with United Nation's assistance and American courage, he made his promise good.

The former president also said that of all his duties as Chief Executive, he derived the greatest satisfaction from bestowing the nation's highest decoration on war heroes.

President Harry S. Truman congratulates Captain James M. Burt, 2nd Armored Division, after presenting him with the Medal of Honor on the White House lawn, Washington, D.C.

Master Sergeant Ernest R. Kouma, Company A, 72d Tank Battalion, was among those men so honored. At midnight on 31 August 1950, a hostile force estimated at 500 crossed the Naktong River and launched a fierce attack against the infantry positions, inflicting heavy casualties.

Tank commander Kouma was part of a blocking force covering the infantry's withdrawal. The enemy

Master Sergeant Ernest R. Kouma

assault overran two tanks, and Kouma's tank was the only obstacle in the path of the enemy onslaught. With 50-caliber machine gun, pistol and hand grenades, he held off the enemy for nine hours allowing the infantry sufficient time to re-establish defensive positions. Sergeant Kouma killed an estimated 250 enemy soldiers and, although suffering intensely from his wounds, attempted to resupply his tank and return to the front after he had reached safety.

The history on Vietnam is still being written. All the accounts of heroism are not yet recorded. But in this jungle war, the cavalryman is well represented in the 134 Medals of Honor awarded thus far in conflict.

A modern cavalry unit, the 1st Cavalry Division (Airmobile) leads all other units in the number of Medals of Honor presented for Vietnam action. Its 25 Medals and the three awarded to members of the 11th Armored Cavalry Regiment account for nearly a quarter of the total earned.

Captain Harold A. Fritz, 11th ACR, contributed to this distinguished record while escorting a truck convoy along Highway 13 near Quan Loi. The column suddenly came under intense fire from a reinforced enemy company deployed in ambush positions. Captain Fritz was seriously wounded in the initial attack, but he leaped to the top of his burning vehicle and directed the positioning of his remaining vehicles and men. He manned a machine

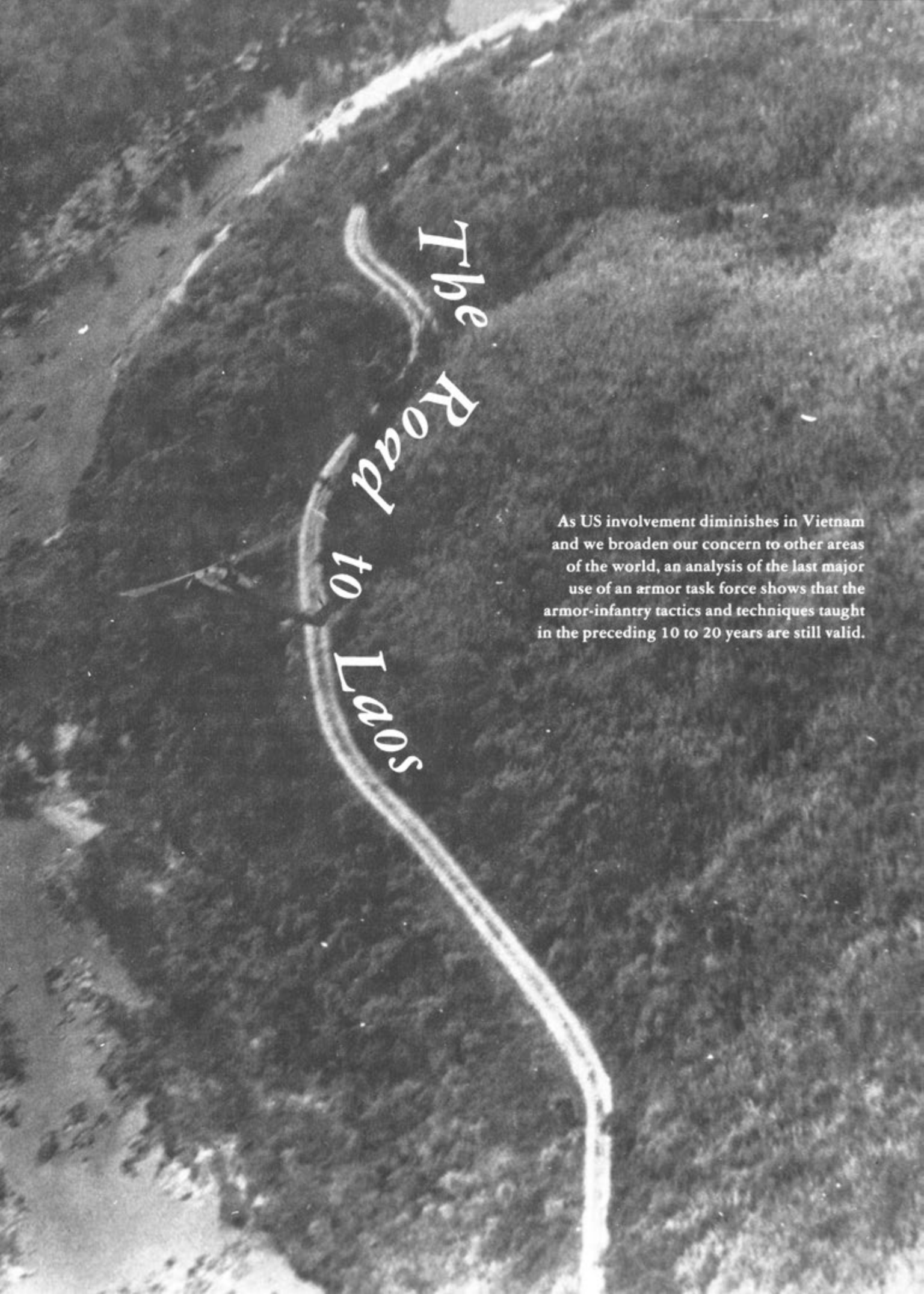
Captain Harold A. Fritz

gun, distributed ammunition, repositioned his troops, and armed only with a pistol and bayonet, led a small group of his men in a daring charge which routed the attackers.

Later Fritz helped a relief force to deploy more effectively and refused medical attention until all of his wounded comrades had been treated and evacuated.

Men like Captain Fritz and all the others won more than fame and a cherished medal. They earned the respect of a grateful nation.

MAJOR MEL R. JONES, ADA, was commissioned in the Army Reserve after graduating from Florida Southern College in 1957. He came on active duty in January 1960 as a battery officer with the 59th Artillery at Fort Bliss, Texas. Major Jones, who was the information officer for the 1st Cavalry Division (Airmobile) during the Cambodian incursion, is currently assigned to the Office of the Chief of Information in Washington, D.C.



The Road to Laos

As US involvement diminishes in Vietnam and we broaden our concern to other areas of the world, an analysis of the last major use of an armor task force shows that the armor-infantry tactics and techniques taught in the preceding 10 to 20 years are still valid.

by Lieutenant Colonel Richard M. Meyer

Whether in Southeast Asia or Europe, the advantages of tailoring units to accomplish specific tasks were never more vividly demonstrated than during the support of Operation Lam Son 719 (29 January to 9 April 1971). The rapid changes in task organization and the support of a variety of units, including Regional Force companies, airborne infantry companies, cavalry troops and artillery batteries, showed the current organization of a tank battalion to be ideally suited for accepting attachments that permit the accomplishment of a variety of tasks.

BACKGROUND

At the close of 1970, the 1st Tank Battalion, 77th Armor, in the vicinity of Quang Tri, completed a month of cross-training with the 1st Battalion, 61st Infantry (Mech). Although combat missions continued, the rotation of units had permitted a separate week of live-fire training to be given simultaneously to a tank company and a mechanized infantry company. Included were mounted and dismounted tank-infantry team techniques, maintenance, use of supporting artillery and organic mortars, and night firing of tanks and infantry weapons. During early January 1971, 1-77 Armor, with attached mechanized infantry companies, participated in several short-term operations which helped solidify the smooth operation of company-level teams.

As part of the 1st Brigade, 5th Infantry Division (Mech), the 1-77 Armor consisted of a headquarters and headquarters company with a 4.2 mortar platoon and a scout platoon, three tank companies, a service support company, and the attachment of the brigade's armored cavalry troop (A/4-12 Cavalry). By January 1971, the only Active Army organization still using *M48* tanks, 1-77 Armor, was the sole remaining tank battalion in Vietnam.

Although no US ground combat troops were to operate in Laos, by the end of January, 1-77 Armor and six other battalion-size forces stood ready for a major role in support of Operation Lam Son 719. The actions of these organizations in support of the Vietnamese incursion into Laos were limited to establishing forward logistical bases, keeping the main supply route (MSR) within South Vietnam open to Laos, and covering the withdrawal from forward bases. However, many significant events did involve US units.

FORWARD BASES

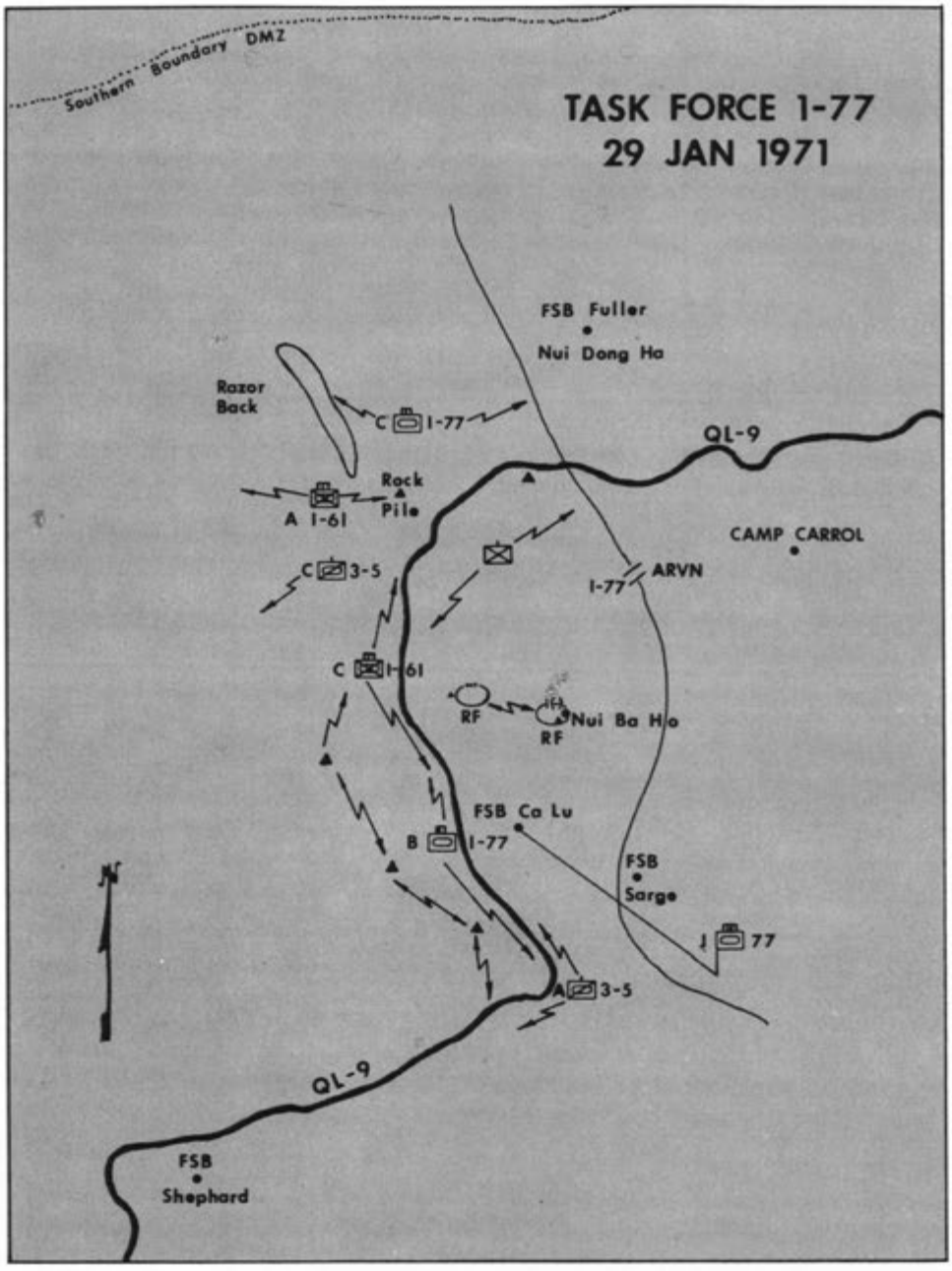
Before Vietnamese Army and Marine units moved into Laos, forward support bases had to be established west of Quang Tri near old Fire Support Base Vandegrift and at Khe Sanh. Brigadier General John G. Hill Jr., commanding general, 1st Brigade, 5th Infantry Division (Mech) initially deployed Task Force 1-77 composed of the 1-77 Armor with two of its tank companies, two cavalry troops of the 3d Squadron, 5th Cavalry, and two infantry companies from the 1st Battalion, 61st Infantry (Mech). The task force's mission was to establish a heavy artillery base at Ca Lu (Old FSB Vandegrift), secure a main supply route from the vicinity of Camp Carroll to the point where Highway QL-9 turns west toward Khe Sanh, and have the two cavalry troops maneuver into position for separate thrusts toward Khe Sanh. Thus, the first few days of the operation would have the appearance of previous artillery raids conducted in that area.

The operation began from Quang Tri at about 0400 hours, 29 January. Until the task force was west of Camp Carroll, all units moved under radio listening silence.

Shortly after first light, the lead tank rolled onto old Fire Support Base Vandegrift. By nightfall, new FSB Ca Lu had two heavy artillery batteries and one medium 155-SP battery in place and firing, one cavalry troop reconnoitering southwest of the Rockpile and the other troop south of Ca Lu ready to head west on QL-9.

One tank company with a platoon of mechanized infantry was probing north and northeast of the Rockpile. Reinforced with the battalion's scout platoon, the other tank company had the mission of local security and outposting the high ground which overlooked the fire base from the west.

Both mechanized infantry companies were minus one platoon but cross-attached with a tank platoon. One company moved west and northwest of the Rockpile, while the other secured QL-9 to the north.



The 4.2 inch mortars of the tank battalion were split with one section of two tubes with the mechanized infantry company near the Rockpile and the other section at Ca Lu.

Two days later, the 1st Brigade of the 5th Infantry Division (Mech), aided by one cavalry squadron, three infantry battalions and a 155-SP artillery battalion opened the road to Khe Sanh. Six days later, the brigade gained the 1st Squadron, 1st Cavalry from the 23d Infantry Division with the squadron performing reconnaissance missions and road security west of Khe Sanh near Lang Vei. Task Force 1-77, having released two cavalry troops and gained one infantry company and an RF company, remained in the vicinity of Ca Lu and was busily developing the security of the fire support/forward logistical base while securing the MSR. Shortly thereafter, long columns of Vietnamese armor and artillery equipment passed through Ca Lu and Khe Sanh enroute to Laos.

KEEPING THE MSR OPEN

As QL-9 was the only land resupply route available to the Vietnamese, it was imperative that Task Force 1-77 keep the road open within its sector while other elements of the brigade secured the road west of Ca Lu through Khe Sanh and Lang Vei to the Laotian border. The 3d Squadron, 5th Cavalry

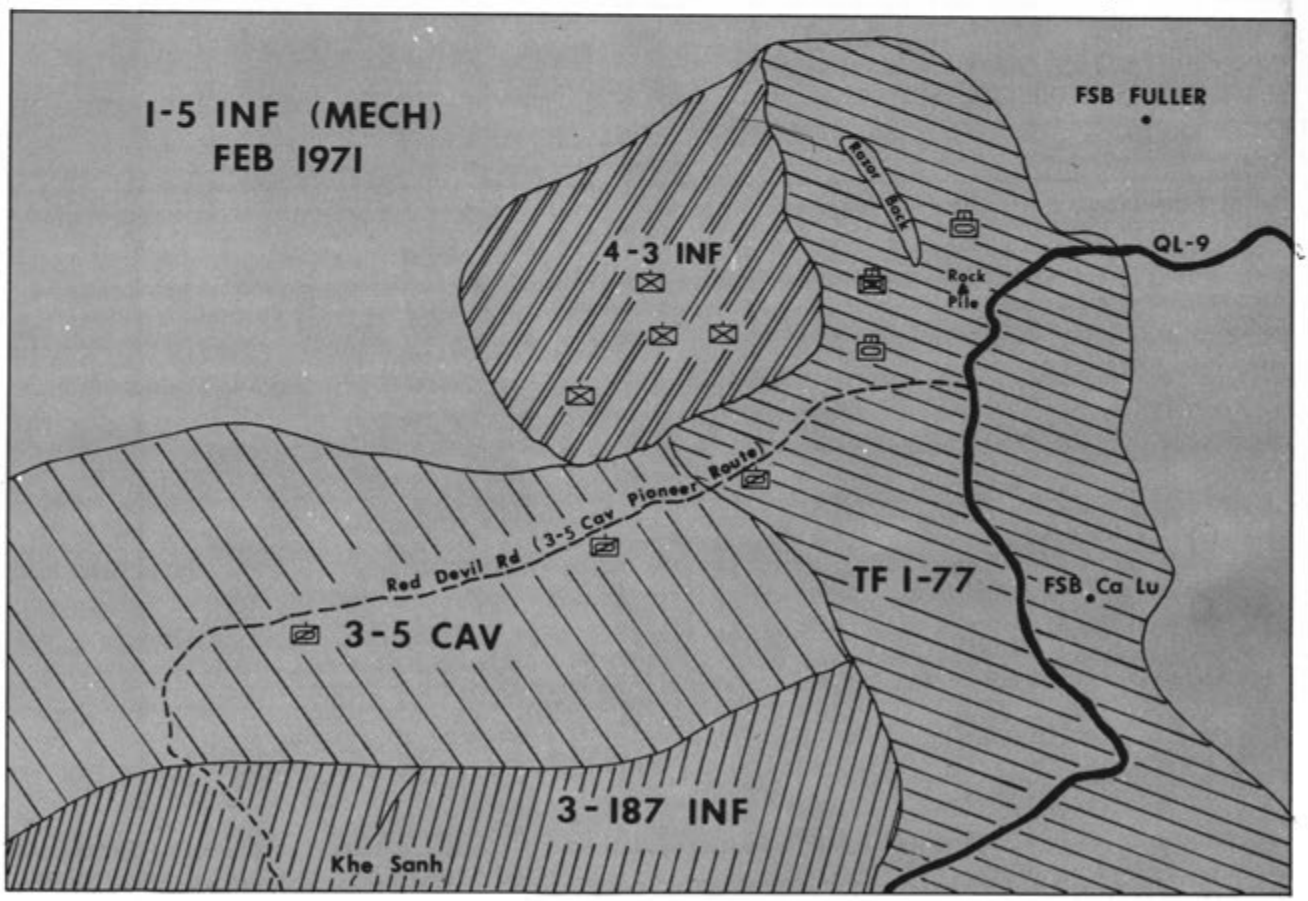
also had the mission to develop an alternate pioneer route from Ca Lu to Khe Sanh. Consequently, 1-77's plan for the route security mission involved two simultaneous activities: continual surveillance of the route to detect enemy ambush attempts, and conduct of operations well to the flank of the route to push the enemy away from the road.

To insure continuous coverage of the road, each team commander was tasked to establish 24-hour OPs on prominent terrain within his team's sector. The positioning of the team OPs was coordinated to insure overlapping coverage of the entire route. Extremely high OPs, such as the ones on the top of the Rockpile and Ba Ho Mountain, were rendered ineffective on occasion because of clouds. During these periods, greater reliance had to be placed on alternate detection means. This was not difficult to accomplish, as the basic OP coverage was supplemented nightly by the emplacement of PPS-5 radars, crew served TVS-4 night observation devices (NODs), seismic intrusion devices (PSID and MINISID) and ambushes. By varying the position of observation posts, nightly patrols and the emplacement of electronic devices, an extensive coverage was obtained of the road and likely ambush routes to the road.

Daily operations by all teams well to the flanks of the MSR were conducted to keep the enemy beyond 82mm mortar range. Due to the varying types of terrain within the task force's sector, a variety of operations were conducted including airmobile assaults, mounted and dismounted area and zone reconnaissance missions, and artillery raids. Teams conducted independent missions, coordinated operations with adjacent teams, and supported attacks by neighboring battalions.

Of special interest were the operations of the two teams in the vicinity of the Rockpile and Razorback, which met early resistance by the enemy. These teams continued to develop the situation by pushing deeper west and north. Two abandoned small enemy camps, three kilometers west of the Rockpile, were uncovered with signs of recent activity and the capture of numerous antitank mines and 60mm mortar and RPG rounds.

As the enemy defense continued, the tank company and scout platoon, responsible for the close-in defense of FSB Ca Lu, were shifted to an area southwest of the Rockpile where, as a team, they could operate in close conjunction with the mechanized infantry team. One operation, conducted with these two teams, encountered stubborn enemy resistance near 1-77's western boundary.



This development of the situation necessitated the commitment of the 4th Battalion, 3d Infantry, 23d Infantry Division, which encountered company-size enemy units in its new AO. After two weeks of bitter fighting, which resulted in the uncovering of numerous enemy camps and caches, 4-3 Infantry was rotated with the 3d Battalion, 187th Airborne Infantry, 101st Airborne Division. In its new area, 3-187 Infantry met the same type of obstinate resistance as had 4-3 Infantry.

By the end of February, General Hill had shifted 3-5 Cavalry's weight to the east, massed artillery in support of this operation, and had Task Force 1-77 block while 4-3 Infantry and 3-187 Infantry attacked. This was the first key battle to keep Route 9 open and it was concluded early in March with major enemy units pushed farther away from QL-9.

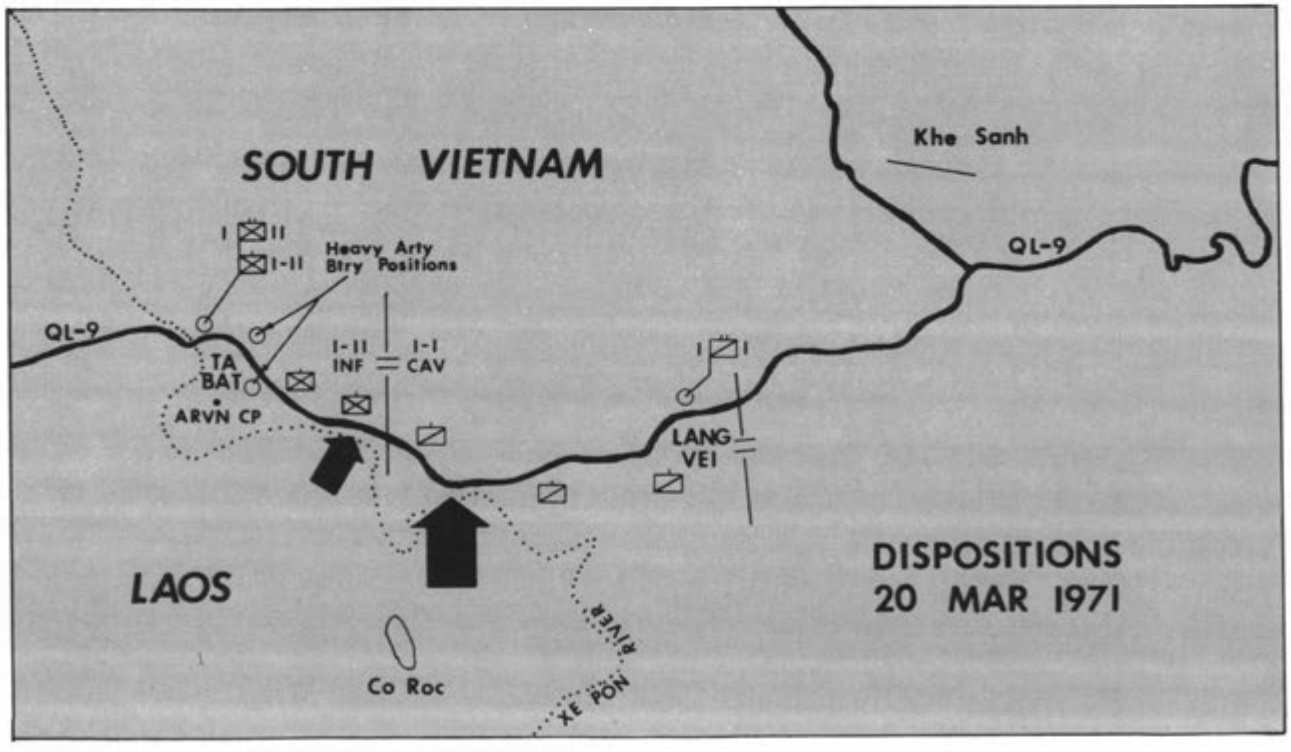
However, during February and March, small enemy teams attempted several ambushes of resupply columns on QL-9, but failed to halt the traffic for more than a few minutes. Although counterambush techniques were based on early detection of the ambushing element by one or more of the OPs, radar crews or patrols, a tie-in with convoy escorts supplemented the available information and served to alert units along the MSR when critical convoys were moving. As these convoys were escorted by gun trucks organic to the transportation battalion that was moving materiel, close liaison was established between the transportation battalion and 1-77's staff.

As soon as an ambush was attempted, the nearest cavalry, tank or mechanized infantry team was dispatched to the scene as adjacent units and artillery fires shifted into blocking positions. The object was to cutoff all likely escape routes by the relocation of units and block inaccessible routes with artillery and mortar fires. The detailed search for the enemy was delegated usually to the team commander of the sector in which the ambush attempt occurred. Invariably, this technique resulted in the destruction of a three-to-five-man team and the capture of RPG launchers, Chicom claymore-type mines, small arms and grenades as the enemy attempted to hide out in the vicinity of the ambush.

Early in March, the task force was placed under the operational control of the 3d Brigade, 101st Airborne Division. As two battalions of infantry took over the task of conducting operations on the flanks of the road, Task Force 1-77 released OPCON of the RF company and one infantry company. Thus, 1-77 was reduced to two tank companies, one mechanized infantry company and one cavalry troop.

ROAD TO LAOS UNDER FIRE

Although subjected to sporadic attacks since early February, on 20 March, the stretch of road from Lang Vei to Ta Bat came under intense enemy RPG, rocket, mortar and artillery fire—especially at the two points where the river (separating Laos and Vietnam) and QL-9 are close together. The enemy



was able to cross over rapidly from Laos, fire at units securing the road, and then withdraw to resupply. At this time, several pieces of equipment including heavy artillery, armored personnel carriers, a helicopter and a few *Sheridans,* were disabled on this stretch of the road.

The responsibility for the road from east of Lang Vei west to the U-shaped bend in the river belonged to the 1st Squadron, 1st Cavalry; and the 1st Battalion, 11th Infantry had the rest of the road from 1-1 Cavalry's western boundary to the Laotian border. Near Ta Bat, just east of 1-11 Infantry's CP, were two heavy artillery batteries in separate locations that had not been resupplied for three days because of the heavy activity along QL-9 from Lang Vei west to the artillery positions.

To remedy this situation, General Hill committed an armor heavy task force that would: reopen the road; evacuate the two heavy artillery batteries to positions east of Lang Vei; recover all abandoned and repairable equipment west of Lang Vei; and hold the road open until all RVNAF units had withdrawn from Laos.

REOPENING THE ROAD

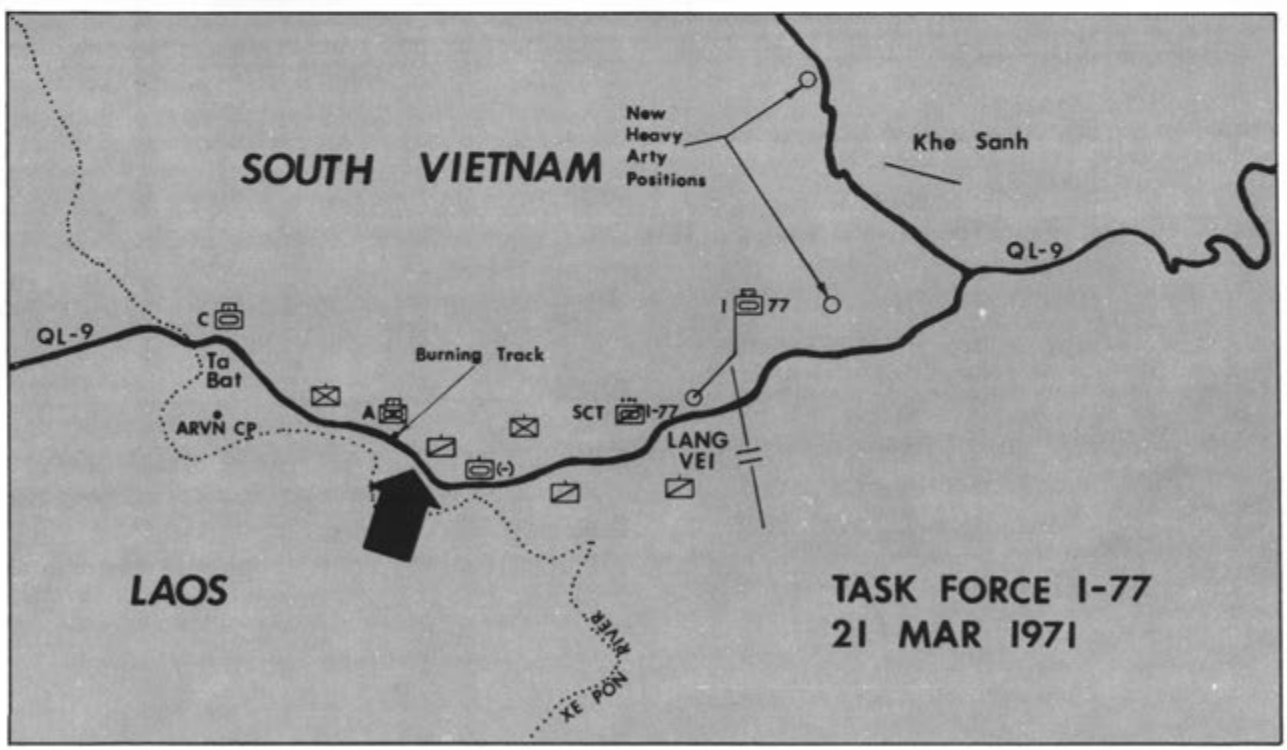
To accomplish these missions, Task Force 1-77 departed Ca Lu on the morning of 21 March with instructions to proceed as far as Lang Vei. As soon as the units were on the move, the task force commander reported to General Hill for a tactical update.

By the time the commander had been briefed by General Hill at Khe Sanh and by Colonel Townes, the brigade deputy commander at Lang Vei, the task force lead element, the 1-77 scout platoon, had married up with the eastern most troop of 1-1 Cavalry. The scout platoon was left with this troop to assist in reorganizing and evacuating their disabled vehicles.

Meanwhile, the remainder of the task force's initial column, with a tank company leading, continued the march to expedite the link-up operation to the west. As the column rounded the first curve near the bend of the river area, a RPG round exploded to the left rear of the leading tank. The column returned the enemy's fire and continued to move, although the next curve again brought the inaccurate RPG fire.

Shortly thereafter, the column, having married up with the second troop of 1-1 Cavalry and one company of 1-11 Infantry, encountered an APC and an abandoned helicopter sitting in the middle of the road. The second tank in the column, attempting to bypass, became stuck in a bomb crater. The rest of the column, temporarily halted in an attempt to recover the tank, continued to receive small arms and RPG fire resulting in the CP track of C/1-77 being hit and several men wounded.

The enemy then began to use mortar and what appeared to be 122mm rocket fire. As soon as the medevac was accomplished, the task force resumed moving west, with the second tank company (B/1-77)



remaining in the vicinity of the stuck tank to provide security for the vehicle and that area of the road. Just as the column resumed its march, a link-up was made with the second company of 1-11 Infantry.

Small arms and RPG fire continued to be received from the south side of the road until shortly before the armor column reached the first heavy artillery position. The column continued moving until it closed into the 1-11 Infantry Battalion CP location at Ta Bat, where it linked-up with the third infantry company awaiting helicopter pickup. As the tanks reached dispersed positions around the infantry battalion's CP, 122mm enemy artillery rounds (not rockets) began to land within the perimeter.

The brigade deputy CO was informed that Task Force 1-77 had established contact with all three troops of 1-1 Cavalry (A/1-1 Cavalry was in position south of the 1-77 CP now at Lang Vei) and two companies of 1-11 Infantry. The deputy commander also was informed that C/1-77 Armor was now in position at Ta Bat and that B/1-77 and A/1-61 Infantry (Mech) had linked-up and were now in the vicinity of C/1-77's burning CP track.

The decision was made to continue airlifting out the third company of 1-11 Infantry which was in process at Ta Bat, and for the 1-11 Infantry CP to be heli-lifted out after that company. The ground mobile equipment of 1-11 Infantry was turned over to Task Force 1-77 for evacuation to Khe Sanh. At 1600 hours, Colonel Townes ordered the task force to assist the two heavy artillery batteries in relocating that day to positions east of Lang Vei.

Subsequently, an escort from B/1-77 was provided the 175mm and 8-inch self-propelled howitzers along with *M42 Dusters*. The other battery was directed to follow the lead battery. In the meantime, a tank platoon of B/1-77 escorted a platoon of mechanized infantry west to the 1-11 Infantry CP location where it was placed OPCON to C/1-77, thus forming Team C. These tanks then secured the wheeled vehicles and RTT rig of 1-11 Infantry during the return to the location of B/1-77 for movement east with the artillery batteries.

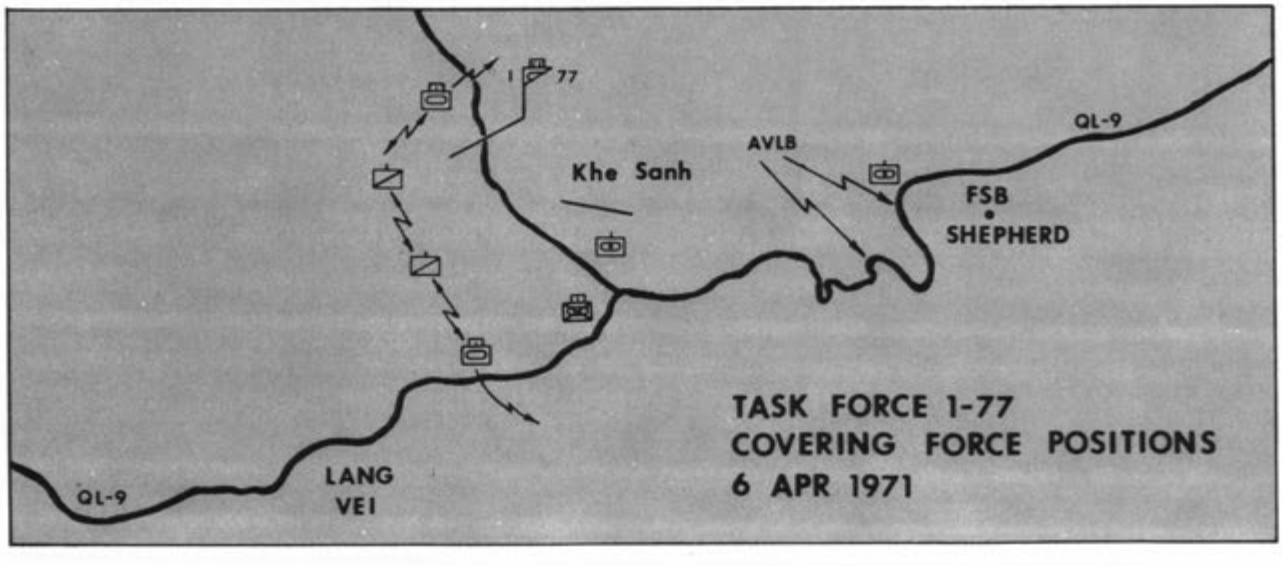
After escorting the heavy artillery batteries into positions east of Lang Vei, two platoons of B/1-77 Armor were sent back to the west and placed OPCON to A/1-61 Infantry (Mech), thereby creating Team A. By nightfall, Task Force 1-77 was spread out along QL-9 from east of Lang Vei to the Laotian border.

For the next two days, *M88* recovery vehicles moved up and down the road recovering numerous APCs (ACAVs), *Sheridans*, three *M48s* which had hit mines, two 175mm SP artillery guns and two 8-inch self-propelled howitzers. Meanwhile, Team B's infantry, with supporting fire from tanks, artillery and airstrikes, maneuvered south of the road until the area was cleared.

The following day, the 1st ARVN Armored Brigade returned from Laos through 1-77's road security forces.

PHASED WITHDRAWAL

After all ARVN units had passed through the task force's sector, Team C was repositioned west of Lang Vei and Team B was moved east of the task force CP. On 23 March, units of 1-1 Cavalry were released to their squadron. After a week, one of the 1-11 Infantry companies was released, reducing Task Force 1-77 to one mechanized infantry, one infantry and two tank companies, with two batteries of 5-4 Artillery (155 SP) in support. During this period, the enemy continued to harass movements along QL-9, but failed to disrupt



recovery efforts or close the road permanently.

As the support activity at Khe Sanh began to be phased out, Task Force 1-77 was repositioned behind 1-11 Infantry, which assumed the mission at Lang Vei, and 3-5 Cavalry, which was in a covering position to the north of Khe Sanh. The task force, with the addition of two cavalry troops, executed a covering force mission of the last ARVN and US units, and withdrew from Khe Sanh. Then 1-77, with an attached 155 SP battery, moved to Ca Lu. The covering force operation for the closure of the forward support activity at Ca Lu was similar with Task Force 1-77, again OPCON to the 3d Brigade, 101st Airborne Division.

On the evening of 9 April, after an absence of 80 days, Task Force 1-77 closed into its base camp at Quang Tri.

RESUPPLY AND MAINTENANCE

Throughout the operation, Company D, 1-77 Armor, the battalion's service support company, handled the combat resupply of the battalion's organic units, and attached and OPCON units to include airborne infantry companies. Utilizing its full-tracked resupply vehicles and cargo trucks, Task Force 1-77 was able to minimize the use of helicopters for resupply activities.

By reducing each tank company and the cavalry troop to one mechanic per platoon and a maintenance sergeant, the battalion was able to augment its maintenance platoon with sufficient personnel to permit weekly rotation of one tank or cavalry platoon to Quang Tri for Q-Service. This period was also used for the replacement of individual clothing and inventory of equipment.

SURVEILLANCE

At the beginning of the operation, the Ground Surveillance Section of 1-77 Armor consisted of ten PPS-5 radars and ten TVS-4 night observation devices (NODs) which were employed by eight radar teams. Every evening, the teams with their radars and NODs were flown to requesting units and integrated into each team's and the task force's overall surveillance plan. The teams and their equipment were then picked up the following morning by helicopter to preclude damage to the sensitive radars, to permit recharging batteries, and to insure complete before-operation checks on all items. The NODs, when used with the pink light of cavalry troop *Sheridans*, were found to be particularly helpful. The infrared searchlights of the *M48s* were used successfully, but with a wish by their crews that the IR searchlight could have been replaced by a pink, *Sheridan*-type light.

FIRE SUPPORT USE AND COORDINATION

Throughout Lam Son 719, the artillery liaison officer to Task Force 1-77, from the 5th Battalion, 4th Artillery (155 SP), presented a coordinated fire plan which integrated the heavy, medium and light artillery fires with the battalion's 4.2 inch mortar fires and the 81mm mortars of the mechanized infantry companies and cavalry troops. Whenever possible, air strikes, ARA (Aerial Rocket Artillery) and gunships were employed simultaneously with indirect artillery and mortar fires. On several occasions, the 165mm demolition gun of a combat engineer vehicle (CEV) was used to soften up reinforced bunker positions occupied by the NVA.

Air cavalry assets generally were employed in

either a close-in, coordinated reconnaissance role with a ground armor-infantry team, or well to the flanks of the task force during its operations within South Vietnam. On numerous occasions a heavy air-recon team, consisting of one or two light observation helicopters, two gunships and a command and control helicopter, spotted enemy positions well in advance of the arrival of a mechanized ground reconnaissance team. Likewise, enemy teams, flushed from cover by the armored vehicles and ground troops, became targets for the gunships. Using aerial scouts in this manner often precluded the use of close-in artillery and mortar fires, which were normally planned and fired in advance and on the flanks of ground units executing an area reconnaissance mission. Although ground troops generally desired aerial scouts and gunships during a contact, the use of close-in supporting and blocking artillery and mortar fires was found to be more effective.

Several times the task force integrated the employment of the air cavalry and ground teams with the task force and air cavalry commanders airborne in the command and control helicopter. This method of operating was preferred by some air cavalry troop commanders, but considered too restrictive by others; it certainly facilitated the rapid shifting of ground units and indirect fire weapons.

CONCLUSIONS

The combined refresher training conducted by a tank and mechanized infantry battalion prior to this operation in a realistic, live-fire mode showed the value of conducting such training in a combat zone at least semiannually. It also is desirable whenever a unit experiences a rapid turnover of personnel.

This operation, conducted with a continual shifting and blending of armor, mechanized infantry, airmobile-infantry, artillery, armored cavalry and air cavalry elements in response to each mission change proved the validity of current US tactical doctrine.

Although the terrain was a restricting factor, Task Force 1-77 conducted route, area and zone reconnaissance, mounted and dismounted attacks, rear covering force missions and performed route security as an economy of force measure. The escort of critical convoys, security of essential bridges, and the guarding of support bases will long be remembered by the track vehicle crewmen. The battalion staff will never forget the rapid shifts of units or the time that the 1-77 CP functioned as the brigade alternate command post.

The role performed by the 1st Tank Battalion, 77th Armor as the nucleus of an armor-infantry task force reaffirmed that a tank or mechanized infantry battalion with a service support company can readily accept attachments or release units; thus providing a flexible tailored force for each particular mission.

Above all, this operation proved that armor operations rest on a frame of mind—a determination to accomplish each mission.

LIEUTENANT COLONEL RICHARD M. MEYER was commanding officer of the 1st Tank Battalion, 77th Armor from November 1970 through April 1971. During the Vietnamese incursion into Laos, he commanded a combined task force. Colonel Meyer is presently professor of military science at Campbell College, North Carolina.

The West German Spähpanzer

8x8 Armored Reconnaissance Vehicle

by Captain V. Roger duPont Jr.

The West German Army recently announced the completion of a newly developed eight-wheeled amphibious armored reconnaissance vehicle. The new vehicle has undergone considerable testing on the Norwegian test grounds at Hjerkinne and at test facilities in Sardinia.

In the mid-1950s, the West German Defense Ministry initiated work on plans for a new generation of wheeled vehicles. Not until 1964 did the Federal Procurement Agency first approach German industry with definite proposals. The overall plan called for equipping the Army with a new family of modern wheeled vehicles during the 1970s. Wheeled vehicles were selected over tracked vehicles because of lower maintenance costs, faster road speeds and good cross-country mobility. Emphasis was placed on swimming capability and armor protection. A specific requirement of a long-range reconnaissance was established to replace the Hotchkiss tracked reconnaissance vehicle, now in service, but soon to be withdrawn.

The *Spähpanzer Rad Schwimmfähig* (amphibious wheeled armored reconnaissance vehicle) is not a new concept, but rather a modernized version of a World War II German patrol wagon.

Initially, two West German industrial complexes were seriously interested in the Defense Ministry's contract for the 8x8 reconnaissance vehicle. The firms of Büssing Automobilwerke AG, Klockner-Humboldt-Deutz AG, Friedrich Krupp GmbH, Maschinenfabrik Augsburg-Nurnberg AG, and Rheinstahl Henschel AG, joined together to establish the Joint German Project Office with intentions of developing the whole family of vehicles. Daimler Benz AG decided not to join the Joint Project Office, but rather to attempt the same goal alone. After four years of extensive testing, the Daimler-Benz firm received the contract to construct the armored vehicles, while the Joint Project Office was awarded the contract for the unarmored vehicles.

The Daimler-Benz 8x8 reconnaissance vehicle is designed for a four-man crew: the driver, gunner, commander and radio operator, who is also the rear driver. A turret-mounted 20mm Rheinmetall MK-20 RH202 automatic cannon is the main armament. An auxiliary 7.62mm machine gun is mounted atop the turret. Power comes from a 450-horsepower, water-cooled, multifuel engine that gives this approximately 19-ton vehicle a maxium speed of 55mph. The transmission is made by Zahnradfabrik Friedrichshafen AG (ZF) and enables the vehicle to be operated in nine forward and nine reverse speeds.

The vehicle has two driving positions, one located forward and another in the rear, and can be driven at maximum speed in either direction. It has a 98.5-inch wheel tread and a 16-inch ground clearance. An independent suspension is attained by use of a torsion bar with vibration damping at each wheel. All wheels are steerable and mount 16.00x20 rough terrain tires that give the vehicle additional buoyancy in water obstacles.

The *Spähpanzer* is designed and equipped to swim (rather than to snorkel or to merely float) across water obstacles. Swimming is accomplished by two 550mm propellers mounted in the rear. Maximum speed in water is about 7mph. Land operation capabilities include a cruising range of approximately 400 miles and a trench crossing limit of 5.9 feet. All-around armor protection is provided against small arms fire and shell fragments. Visibility for the crew is good. The infrared/white light searchlight is countersunk into the mantlet of the turret and can thus be easily traversed.

Production of the 8x8 *Spähpanzer* is scheduled to begin about mid-1972. It is a high priority item and will be the first of the new family of vehicles to enter series production.

Amphibious Armored Reconnaissance Vehicle, 8x8

Weight, combat loaded: 19-20 short tons

Armament: 1x20mm Rh202 machine gun
1x7.62mm MG3 machine gun

Development schedule:

1962 Established military characteristics for a heavy wheeled armored vehicle for long range reconnaissance, to replace the Hotchkiss tracked vehicle developed by France. (Büssing Automobilwerke, AG, already engaged in development of an 8-wheeled armored reconnaissance vehicle.)

1964 Concept proposal and specifications passed to industry for development. (Büssing had already completed a pilot model.)

1965 West German heavy commercial vehicle industry established a Joint Project Office (JPO) for development of a family of 4-, 6-, and 8-wheeled vehicles for cargo and personnel transport purposes and including, on a higher priority basis, the armored reconnaissance vehicle. Five firms participated: The Büssing firm, Klöckner-Humboldt-Deutz AG, Friedrich Krupp GmbH, Maschinenfabrik Augsburg-Nürnberg AG (MAN), and Rheinstahl Henschel AG. Meanwhile, Daimler-Benz AG proceeded to independently develop an 8-wheeled ARV.

1967-68 Conducted first manufacturers' trials. Tests of initial prototypes underway at Army test centers.

1969-70 Manufacturers delivered additional prototypes for competitive testing.

1971 The Army tested prototypes equipped with different major components (e.g., three engines—two liquid cooled, one air cooled—and two transmissions).

Current status The Army selected the Daimler-Benz multifuel, liquid-cooled engine, and awarded Daimler-Benz the contract for construction of the armored vehicle (including the 8x8 ARV) members of West Germany's new family of vehicles; the JPO received the contract for the unarmored vehicles.

Future status Scheduled to enter series production in 1972.

CAPTAIN V. ROGER duPONT JR., Military Intelligence, was commissioned in 1969 from Engineer Officer Candidate School, Fort Belvoir. He has served as a brigade S2 at Fort Polk and with the Combined Material Exploitation Center in Vietnam. Captain duPont is currently assigned to the US Army Foreign Science and Technology Center.

You've heard of an armor blocking force and a naval blocking force, but would you believe . . .

An Aerial Blocking Force

by Fred K. McCoy

As it now stands, NATO has no guarantee that it could stop a massive Communist armor attack in Europe. The Warsaw Pact States have a tremendous number of tanks immediately available. The Communists proved in Hungary and again in Czechoslovakia that they can maneuver many tank divisions rapidly and effectively. Unclassified estimates of the relative balance of tank power leave plenty of doubt that combined NATO armor forces can successfully block a major armor advance. If we have to slug it on a tank-for-tank basis, the verdict would have to be that we could not do it without something extra to tip the balance in our favor. Looking at this potential threat, the US Army Combat Developments Command (USACDC) has invested research and thought in how to block armor.

There are several good antitank possibilities, and all of them are receiving attention; however, the attack helicopter may be the equalizer. We'll field a mix, but the attack helicopter leads the list. A comparatively small number of advanced attack helicopters with the most recent anti-armor weapons may reverse the imbalance in the tank-to-tank ratio. A good candidate for the advanced helicopter is the all-weather capable *AH56 Cheyenne*, equipped with the wire-guided *TOW* missile or even more advanced fire-and-forget missiles.

The *Cheyenne* is exceptionally fast and maneuverable because it is a compound helicopter with lift supplied by both rotor and wings. It is armored against small arms so it can fly low and keep going even under fire from individual ground troops. It carries a heavy payload, including an ample alloca-

Both attack and scout helicopters engage and observe nose-on from low altitude to take advantage of their profile.

tion of *TOW* missiles, which field trials show to be devastating against armor. It can operate in weather and visual conditions that deny close air support. To put it simply, it has been deliberately designed to do things no previous helicopter or fixed wing aircraft could do. There may be worthy competitors to the *Cheyenne*, but the point is, the Army could have a very tough and fast block against armor in the attack helicopter.

Lieutenant General John Norton, commanding general of USACDC, doesn't like calling the attack helicopter a "flying tank." But at the same time, he doesn't feel comfortable referring to it as an aircraft in the usual sense. He feels that these terms tend to imply that the attack helicopter would replace tanks on the one hand, or Air Force close air support on the other. He wants to make it clear that the attack helicopter fills a gap between tanks and close air support. It has a role that neither of the other has.

The attack helicopter doesn't replace close air support penetration of the enemy air defense umbrella and delivery of massive amounts of ordnance. And it doesn't completely replace tanks because we've got to keep enemy armor forces honest on the ground. If the enemy were facing our air alone, he could put his self-propelled air defense weapons out in a protective ring around his armor. As long as we have both artillery and armor, he has got to keep his thin-skinned air defense weapons behind his tanks. Then we can attack with air.

Current Warsaw Pact armor doctrine seems to favor rapid, deep tank column thrusts. That doctrine serves up tanks just exactly the way the attack helicopter likes to eat them. Alternatively, the enemy could try to advance the whole forward edge of the battle area (FEBA) slowly on a relatively smooth front, and the attack helicopters would have to just nibble at the leading edge to avoid interlocking air defense cover on the flanks. But if he plunges an armor column narrowly into our defense, the attack helicopters will bite in from the point and both flanks.

It is hoped that the enemy will bring plenty of self-propelled air defense weapons along on the push, too. They will slow him down, dilute his ground power, and give him serious ammo re-supply problems. If he tries to slip these burdens by moving ahead of his AD weapons when they stop to fire, our tanks will eat up his AA guns at the same time our attack helicopters are chewing up his less protected tanks. All considered, if the enemy's armor meets our combined armor, artillery, attack helicopters and close air support, he is going to have to decide between severe losses or a very cautious movement of his FEBA.

Given this kind of potential, the Combat Developments Command was eager to develop the doctrine, tactics and techniques to employ the attack helicopter in the anti-armor role. Throughout most of 1970, a USACDC task group with a broad span of expertise proposed trial concepts and submitted them to validation. The group was supported by USACDC's Institute of Special Studies which had been working at the center of attack helicopter doctrinal development for several years, and have developed many of the ideas and data necessary for doctrine, tactics and techniques, organization and material requirements.

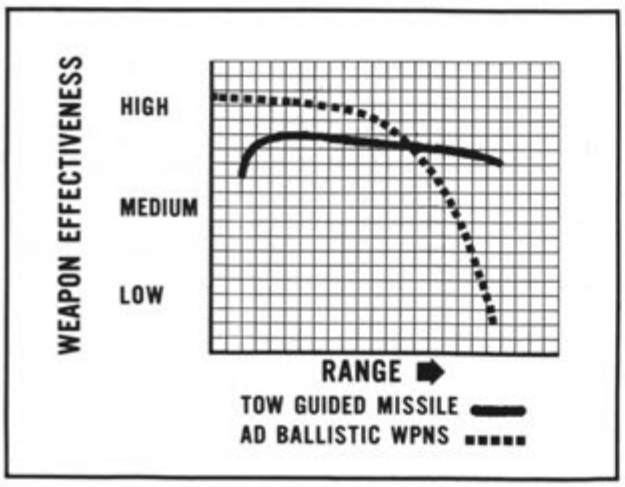
Starting with the advanced concepts and the mass of data furnished by that Institute, the task group dredged up every suggestion ranging from the somber to the hilarious. Everything was considered. Field results were available from USACDC's Experimentation Center at Fort Ord and from the US Army in Europe. The task group had more than its share of helicopter pilots with Vietnam experience, and they took their work on the project very personally. They took it objectively too; the study included vigorous analysis by slide-rule types.

One contractor exhaustively simulated 420 helicopter/tank engagements by computer, and another contractor conducted a computer-assisted war game hypothetically set in a likely European arena. When USACDC's own analysts boiled down both the pilots' experience and the computers' numbers, a handful of strongly supported study findings settled out.

One finding is very clearcut. When an attack helicopter faces a tank unit nose-on, he takes maximum advantage of his narrow profile, shields his rear exhaust thermal image, and gets his best observation. This is one of the main reasons the attack helicopter wants to catch armor in a deep penetration; the helicopter doesn't have to show any broadside to flanking air defense weapons. At the same time, attack helicopters also want to engage from low altitude so they don't have to expose any belly. Low-level, nose-on contact makes attack helicopters difficult to track by visual, infrared or radar-directed weapons.

Another finding is that the greater the range of engagement, the better for the helicopter. Firing from greater range makes any weapon less vulnerable to enemy counterfire, but the *TOW* missile pays a bonus effect. A guided missile like the *TOW* does not lose much accuracy with greater range because the operator keeps correcting the missile flight.

Almost all gun type air defense weapons see their accuracy and striking force deteriorate rapidly after they pass their best ranges. This relationship can be shown on a simple graph with weapons effectiveness on the ordinate and range on the abscissa. The solid line represents the *TOW*'s effectiveness by range. The dotted line represents typical gun type AD weapons effectiveness by range. The graph always shows a cross-over point. There is, of course, a maximum range for the *TOW*, but computations of best data show the cross-over point is within this maximum range for all cases. Each case represents an attack helicopter with *TOW* duelling with typical forward area air defense weapons. This means the attack helicopter should always engage from the maximum practical range.



The attack helicopter engages from the maximum range to take advantage of the cross-over point in effectiveness of the *TOW* versus air defense weapons by range.

A third finding involves duration of exposure of the attack helicopter to enemy weapons. The less time the helicopter is exposed, the less probability the enemy has:

. . . of detecting it,
. . . of shooting at it if detected,
. . . of hitting it if shooting, and
. . . of destroying it if hit.

This principle is true of almost all weapons; but unlike most, the attack helicopter can do something about it. It can fly low, terrain-hugging routes, engage from the local horizon, and keep down out out of line-of-sight for most of its flight. This ability is enhanced by the performance and design of the advanced attack helicopter, and can be further enhanced by employing supporting scout helicopters to take some of the exposure risks.

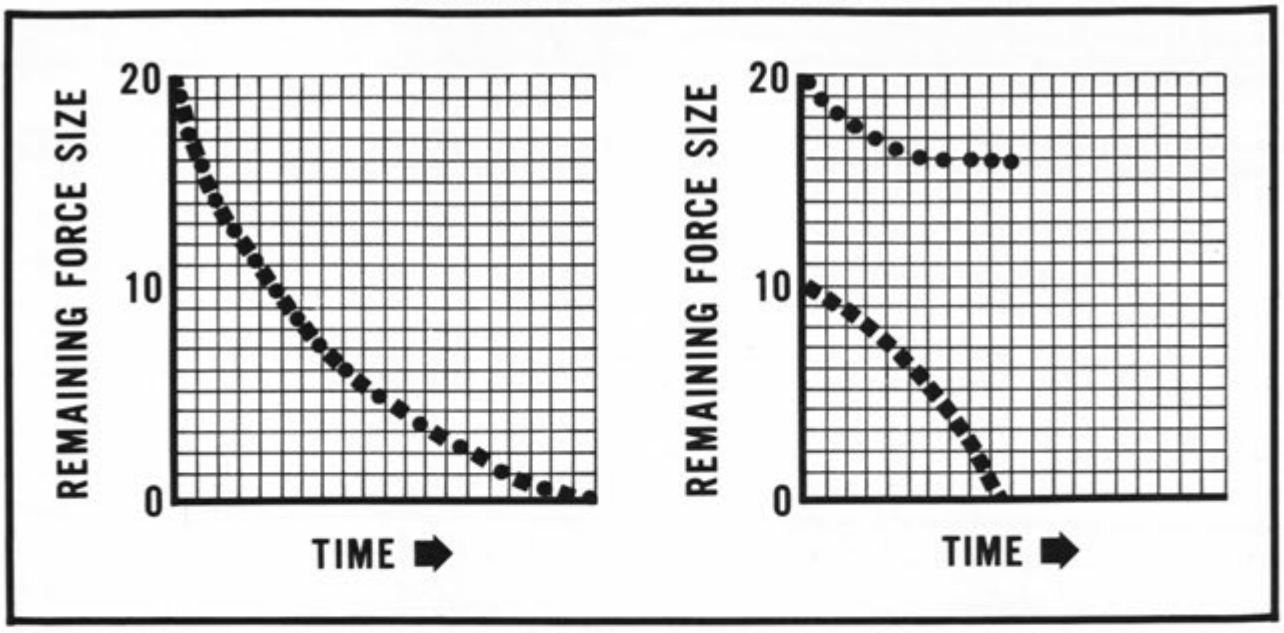
Another finding concerns the well-known principle of massing firepower. Whenever you deliver a given amount of fire on any enemy, you always have the choice of employing fewer weapons over more time or employing more weapons in less time. It is usually better to mass more weapons to fire a shorter time because it gives any finite number of enemy weapons less reaction fire. This can be visualized on a pair of graphs with remaining force size on the ordinate and time elapsed on the abscissa.

If two forces meet each other that are equal in all respects, including initial size, they inflict equal casualties on each other and both forces are attrited together. . . to zero, or until one commander recognizes the inevitable and breaks off. However, if the two forces are equal in all respects except initial size, the larger force inflicts greater and greater casualties over time while the small force becomes less and less able to inflict casualties.

In keeping with the historic Lanchester equations, the mathematics of the situation not only guarantees the larger force the victory, which a larger force would expect, but also assures it will take less loss than it would in winning with a small force. When your force size is large enough to saturate all the enemy's weapons, some of your force is free from being fired on at the same time your weapons are ganging up on targets. Even when your total force is not superior, this tactic can be applied locally by dividing the enemy and defeating him piecemeal. Any military force will do this if it has greater mobility than its enemy, and the attack helicopter clearly has greater mobility than the enemy ground armor.

A fifth finding concerns the ancient military tactic of suppressing the enemy. Your suppressive fire

MASSING: Theoretic Example



Two forces are equal in all respects. Both sides have force size 20. If they engage each other in full strength, each will inflict one casualty on the other during the first time period and have force size 19 remaining. Since they are still equal at the start of the second time period, it will end with both sides having force size 18 remaining. Both sides decrease together . . . to zero, or until one commander recognizes the inevitable and breaks off contact.

However, if one force has sufficient mobility to engage half the enemy force with his whole force, the first time period starts with force size 20 facing a force size 10. The larger force has a two to one advantage and inflicts two casualties during the time required for the smaller force to inflict one. The second period starts with force sizes 19 to 8, a little more than a two to one advantage. During the second period while the smaller force inflicts one casualty, it is reduced to force size 6. Since the third period starts at 18 to 6, the larger force has a three to one advantage and inflicts three casualties during the time needed for the smaller force to inflict one. The fourth period starts at 17 to 3, giving the larger force more than a five to one advantage. In the fourth period, the larger force wipes out the smaller one at a cost of one or less casualty. The local battle ends with force sizes 16 and 0. It is not remarkable that the larger force wins, but it inflicted ten casualties at a loss of only four, and now also outnumbers the other half of the enemy force 16 to 10.

keeps his head down, hinders his maneuver, and degrades his fire effectiveness. Your deception, smoke and electronics suppress his observation. The main limit to the effect of suppression is how long you are able to sustain it. This principle takes an added value in the helicopter/tank engagement because the helicopter attack is characterized by short, intense fire exchanges. Suppressive fires by artillery and other weapons dampen the enemy's fire capability, and at the same time advanced attack helicopters have means of suppressing air defense radar and visual observation.

The USACDC task group considered the findings just outlined, and others derived from classified data sources. Results of computer-assisted war gaming and field experience led to a doctrinal statement. The doctrine, concepts, tactics and techniques are available in the unclassified handbook "Attack Helicopter Units Battle Drill, II 17-37-5," published by the Armor Agency, USACDC, Fort Knox 40121.

While the detailed statement of means of employment is complex, the essentials can be summarized briefly in five phrases: nap-of-earth, stand-off, mask/cresting, nose-on, and mass-and-move.

NAP-OF-EARTH. *Attack helicopters operate at the minimum practical altitudes in the vicinity of the enemy.* When it is well back, the attack helicopter flies at comfortable altitudes, but the closer the flight approaches the enemy, the more it flies between and among hilltops, trees and other salient terrain features. This tactic applies to three of the findings. Duration of exposure is reduced to those brief periods when the helicopter briefly breaks defilade. The helicopter intentionally breaks defilade only at maximum practical ranges. When the helicopter is exposed, it displays the most favorable profile, virtually no bottom or side view.

STAND OFF. *Attack helicopters engage targets from the maximum practical range.* Whenever possible, the *TOW* is launched from its maximum range. This is outside the maximum effective range for typical gun-type air defense weapons. At the same time, one of the principal features of a guided missile is that its accuracy does not deteriorate very much with range because the guidance system corrects its flight. Whenever it cannot engage from

maximum *TOW* range, the attack helicopter fires from the greatest practical range allowed by terrain, visual conditions and the tactical situation. This tactic capitalizes on the finding that greater range increases survivability of the gunship while only slightly degrading its effectiveness.

MASK/CRESTING. *Attack helicopters remain masked from the target until the latest practical moment, crest the mask at the minimum practical altitude, engage for the minimum practical time, and recover masking at the earliest practical moment.* The aircraft take advantage of masking terrain such as hills and trees in the target area to remain masked until the moment of engagement. Scout helicopters or ground observers provide targeting information prior to cresting. If the nature of the target requires more fire, the flight makes multiple engagements from different cresting points. Mask/cresting increases attack helicopter survival by decreasing duration of exposure.

NOSE-ON. *Attack helicopters keep their front profiles oriented toward the maximum number of enemy air defense weapons.* This tactic takes advantage of the nose-on narrow front profile of the attack helicopter, and maximizes shielding of the rear exhaust thermal signature. If the enemy forward edge has any breadth at all, some air defense weapons will have more sideview; so the best target is a relatively narrow armor column thrust. The attack helicopter never intentionally turns its side, bottom or rear aspect to enemy air defense weapons. This tactic increases attack helicopter survival at the same time it gives the helicopter its best lines of observation and fire.

MASS-AND-MOVE *Attack helicopters engage targets with the maximum practical number of helicopters locally, with maximum practical suppression, and move rapidly between the maximum practical number of local targets.* This tactic takes advantage of the mobility of advanced attack helicopters to apply the principle of massed firepower and suppressive techniques. It is better to attack each target with a concentration of aircraft than to scatter attack helicopters out over more targets. This is true in principle up to any theoretic number, but has practical limitations. Considerations such as span of control, dispersion for security, the responsiveness of small elements under operational control, and the total number of birds available, put a limit on massing. In practice, the mass-and-move tactic is applied by committing teams of three instead of two, or committing a platoon of five, when circumstances permit. The advantages of mass are traded off against the advantages of distribution. When applied, massing increases the amount of damage inflicted on the enemy.

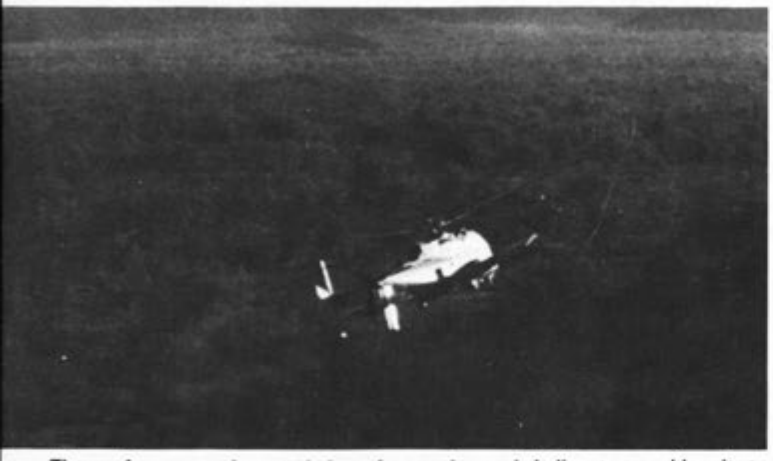
When the attack helicopter tactics are summarized, they look a lot like the familiar blocking force in armor operations. Like the ground armor blocking force, the aerial blocking force keeps low, faces the enemy's boldest points of advance, inflicts serious damage from afar, blunts an enemy point, and moves rapidly to another point of engagement. In fact, it is easy to think of an attack helicopter battalion as part of a brigade-sized covering force facing the advance of enemy armor divisions. Formations of attack helicopters dash from point to point meeting enemy armor thrusts. In this role, attack helicopters would accomplish one of two goals:

- Against an aggressive foe relying on armor thrusts, the attack helicopters would be expected to impose such tank casualties that covering force doctrine might include killing zones.
- Against a cautious foe, aerial blocking forces channel enemy moves, influencing his maneuver. The enemy's ultimate cautious tactic would be to advance his entire FEBA on a slow, relatively smooth front with maximum air de-

In addition to suppressive fires, the attack helicopter takes advantage of camouflage and electronics to suppress observation and radar.

fense. In this case, attack helicopters would impose delay on a strategic level.

It would be possible to go to sketching such attack helicopter tactics similar to armor tactics if



The performance characteristics of an advanced helicopter enables it to maneuver for very brief exposures to the enemy.

you want to think in terms of aerial blocking forces.

Whether or not you want to think of them as manning "aerial blocking positions," attack helicopters can stop armor. In addition to its other missions, an attack helicopter unit could meet and disorganize any significant armor thrust on a broad front. As current concepts come under increasing study and shake-down in the field, attack helicopters will close the gap between NATO defensive capabilities and the massive armor offensive capability of the Warsaw Pact Bloc. The attack helicopter will be part of a modern, balanced NATO defensive shield.

FRED K. McKOY is an operations research analyst for the Systems Analysis Group of the US Army Combat Developments Command at Fort Belvoir. His interest in attack helicopters doctrine stems from his participation in projects such as the attack helicopter daylight-defense field experiment, the field tests in ACCB and TRICAP, and a recent study concerning employment of attack helicopters to defeat armor. A graduate of the University of Richmond, Mr. McKoy has been with CDC since 1965.

ARMOR OFFICER SCHOOL SELECTIONS

ARMY WAR COLLEGE
7 August 1972 – 11 June 1973

LTC Anderson, Thurman E
COL Bachinski, Stephen
LTC Coffman, Richard L
LTC Cooley, Andrew L Jr
LTC DeCamp, William S
LTC DeFrance, Rudolph
LTC Dozier, James L
LTC Hostler, Howard K
LTC Kelly, Thomas W
LTC Palmer, Dave R
LTC Putnam, Carl M Jr
LTC Reed, James B
LTC Reed, Robert T
LTC Sorley, Lewis S III
LTC Sunell, Robert J
LTC Williams, Bruce F
LTC Woodmansee, John W

AIR WAR COLLEGE
2 August 1972 – 23 May 1973

LTC Easterling, Ned H J
LTC Mills, Robert W

INDUSTRIAL COLLEGE OF THE ARMED FORCES
11 August 1972 – 8 June 1973

LTC Ballantyne, John L
LTC Hudachek, John W
LTC Vinson, Newell E

INTER-AMERICAN DEFENSE COLLEGE
1 September 1972 – 15 June 1973

LTC Brown, Dewey E

NATIONAL WAR COLLEGE
8 August 1972 – 6 June 1973

LTC Delamain, Frederic
LTC Mason, John
LTC Smith, Tommie G
LTC Vesser, Dale A

NAVAL WAR COLLEGE
25 August 1972 – 25 June 1973

LTC Duke, Lee E
LTC Filaseta, Bart M
LTC Lutz, Joseph C

ARMOR SELECTIONS FOR COLONEL-AUS

*Secondary Zone #Army Aviator

Adams, William A 0279	Prillaman, John P 0662	Sutton, Larry L 0549
Alderman, Craig Jr 0493	Prine, Wendell L 0177	Taylor, George E 0764
Anderson, Andrew H 0481	Quinn, Paul D 0680	Vandermeer, Richard 0641
*Anderson, Thurman E 0856	Rhyne, Hal B 0635	Watkins, Walter L 0343
Baird, Niven J 0791	Smith, Tommie G 0244	Weaver, Gene A 0277
# Booth, James W 0211	# Stoverink, Robert I 0217	Williams, Bruce F 0534
Brown, Paul J 0733	Stuart, James R Jr 0637	Zargan, Robert T 0644
Cartland, Harry E 0472.3		
Coad, William F 0519		
Cole, Thomas F 0484		
Colson, James B Jr 0614		
Creighton, Neal 0638		
•Doyle, David K 0833.3		
Grzybowski, Conrad 0449		
Hamilton, John D 0439		
# Hawkins, Algin S 0290		
#*Hostler, Howard K 0906		
Lamp, Harold R 0494		
•Ley, Robert E 0889		
Lodge, Warren J 0213		
Luck, Robert H 0230		
Lynch, Thomas P 0143		
# Mayse, Harvey C 0266		
Miller, Richard A 0657		

ARMOR BOX SCORE

OVERALL

	CONSIDERED	SELECTED	% SELECTED	SECONDARY ZONE SELECTED
Armor	170	34	20%	4
Army	2298	660	29%	66

FIRST TIME CONSIDERED

	TOTAL	SELECTED	% SELECTED
Armor	85	34	40%
Army	1176	568	48%

The following is an exclusive *ARMOR* release of a parchment recently found by archaeologists.

TROJAN

MEMORANDUM TO: Commanding General, Defense Forces, City of Troy (DFT)
Room III (Hexagon)
Troy XXVI
FROM: Chief, Trojan Scouts (Light Horse)

As you know, Sir, there have been no major engagements between opposing forces for the past six months. General Thadius reports his heavy chariot task forces have advanced to the sea on the south and to the banks of the Troad on the north. This seems to indicate a general withdrawal of Greek Forces. This is further substantiated by a captured dispatch received by my office two weeks ago from CG, XII Greek Corps (expeditionary) that the siege of Troy has been terminated. It would appear that the information above definitely indicates that the enemy has abandoned the seige of our great city. However, the following is brought to your attention for analysis:

- General Thadius' forceful attempts to advance to the west has met with no success. The west axis has always contained a high density of enemy forces because it is the enemy's main supply route.
- Helen is still in Troy after 10 years of siege. This siege has cost the enemy the loss of many great warriors and staggering casualty figures. The cost in equipment and materiel is indeterminable; however, defenses, depots and compounds along the west axis are firmly established and the enemy is in full knowledge of our deteriorating personnel and logistical situation within the city. It seems unlikely that Greece can so easily abandon her position at this point.
- A review of major actions during this long war include the unsuccessful attempt eight years ago by 8,000 enemy troops to breach the walls of Troy. Four years ago, 28,000 enemy troops stormed the walls and were repulsed. Six months ago, a force of over 50,000 laid seige against Troy and were repulsed after heavy losses to our forces. An estimated 100,000 enemy troops are now on Trojan soil. We have determined that low morale and disease are taking their daily toll. The apparent retirement from contact is either a sincere effort to terminate hostilities or a covert move with significant purpose.

In view of, and in spite of, General Thadius' expressed opinion of the value of light horse elements and certain overt comments from members of your staff on my conduct

SCOUTS

of warfare, I ask your urgent consideration of a few facts and my analysis of them:

- Last week, one of my recon parties penetrated to the seacoast of the west axis and reports that ships leaving the Greek-controlled port of Thepe are riding high in the water, indicating a light cargo or empty. With a requirement for troop transport of an entire Army, it appears sensible to assume that ships would not return to Greece empty.
- Another undetected recon team reached the vicinity of the enemy's XII Corps Headquarters. The compound is being dismantled piece by piece. However, with the material the enemy is constructing a massive wheel-supported tower in the shape of a horse. As to why an assault tower is in the shape of a horse cannot be definitely determined.

After dealing with the enemy for a decade, I predict certain related events will take place in the next few weeks:

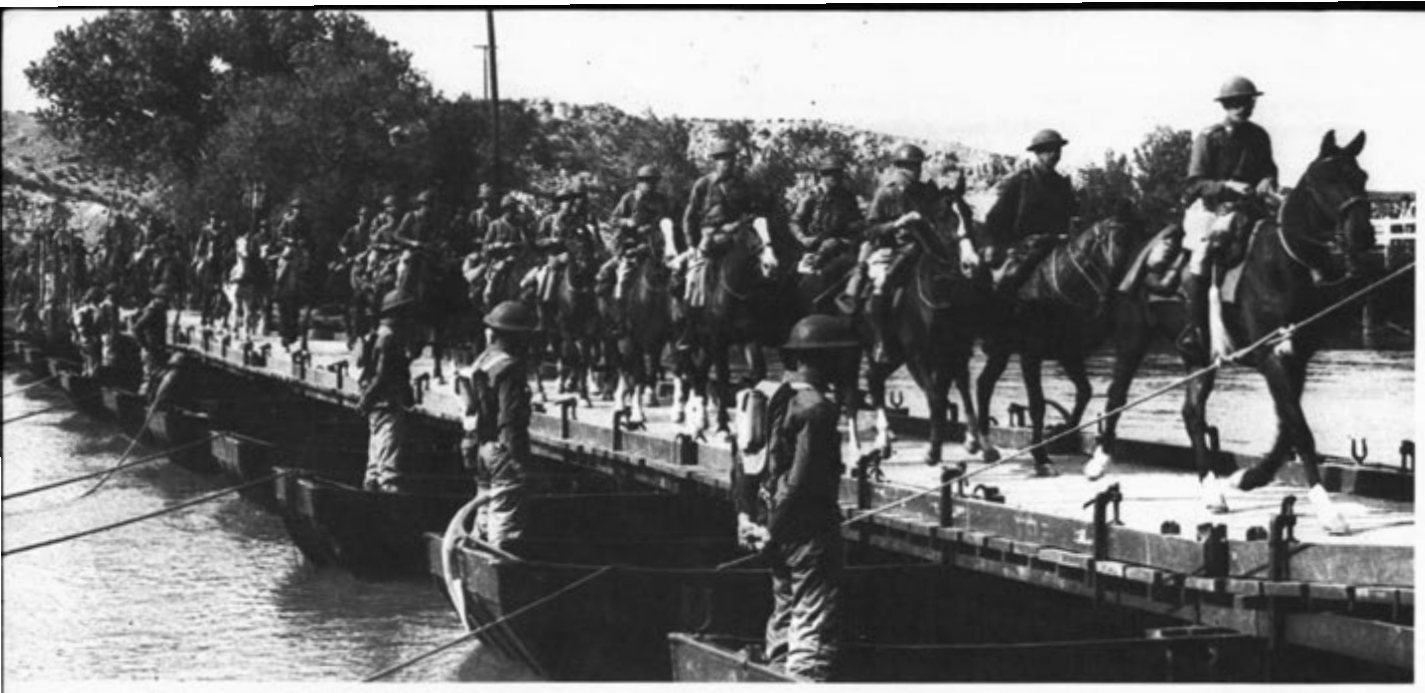
- The Greeks will attempt to move this massive horse tower towards the city of Troy. I believe the tower is being constructed in the shape of a horse to be offered as a gift to the city in admiration for its stouthearted-ness and pledge to a truce. The Greeks are well aware of Trojan fondness for symbols, especially the horse.
- The Greeks will attempt negotiations with you in order that exposed horses and troops will be permitted to maneuver the tower to the gate of the city before their ceremonial march to the sea.
- I ascertain the horse tower will be slightly larger than the gate resulting in a requirement to remove both the gate and wall sections for its entry.

General, I know the Trojans are tired of war, but do not be influenced by the Senate Council. Let me now dispatch riders to return our chariot forces from futile efforts in the north and south.

Above all, if events materialize as I predict, I appeal to you, Sir, as a dedicated soldier who knows the enemy and as a citizen who truly loves Troy—don't let that damn wooden horse through the gate.

LUCIDIUS

LUCIDIUS, a frequent *ARMOR* author, has served extensively in armored cavalry units.



military history and the junior officer

by captain thomas e. c. margrave

One of the principal activities of retired soldiers has been the writing of their memoirs of past military exploits. As my contemporaries and I take pen in hand many years from today, we will no doubt find our memory dimmed and the facts of yesteryear too often intermingled with the polish of our more venerated war stories. Whether we will be able to return to the records of the period to find the facts depends in great part on each and every one of us as commanders and staff officers.

Military history is the recording of past events of military significance. It is composed not only of facts (what happened and what the cost was in terms of men and materiel), but also of opinions and conjectures (what might have happened and why the events occurred the way they did). This history is important to military men only if the record has not been too colored by people's hopes and second guesses.

Military history is vitally important to two groups of people in the military establishment: the planners and the trainers. The planners are interested because they use the data gathered on a past battle or campaign and extrapolate it into planning the force structures, tactics, weapons and logistical requirements of the next war. The trainers are interested for two major reasons: they use this information to train soldiers how to survive and win on any potential battlefield, and train leaders to make the correct decisions based on the information available. In view of the obvious necessity for information, the junior officer must do his part, if only to ensure that he has the correct information, and enough of it to work as a planner or a trainer. These roles are likely to occupy much of his time during his career.

The role of the junior officer in dealing with military history depends to a significant extent on what his job is. As a commander or as a battalion-level staff officer, he directly influences the action.

Unit commanders are responsible for building and maintaining unit historical files. In addition, they are responsible for shipping the files to storage if their unit is inactivated or the files cannot be properly cared for. When the unit is formed again, or is again able to care for their files, the commander may contact the Office of the Chief of Military History (OCMH) requesting the return of the files to the unit. These materials give a solid foundation for tying the events of today with the accomplishments of the past.

Every unit has the right to its historical file; it is a trust from all former members to the present

Military history is vitally important to Army planners and trainers. Junior officers have a tremendous opportunity to influence the effectiveness of their unit's historical documentation.

members. Commanders at battalion-level and below can use this information in their Troop Information classes. A rallying cry in time of stress 100 years ago can become a morale builder to the trooper of today. Particularly in Vietnam, many company-size elements have won individual unit awards for their guidons. These are a source of pride to the soldier and a link with a hard-won past.

Commanders can measurably help the collection of historical data by professional historians by insisting on the keeping of a unit history. Unit histories can form the basis for unit citations and individual awards. As an aid in preparation of the unit history, the remarks section of the Morning Report should be used. Doing this, the unit's copy of the Morning Report gives the compiler of a history a chronological skeleton on which to hang interviews, photos and background data.

As a way of linking the unit to its past, the commander should insist that the officers and men display the distinctive insignia as prescribed by the uniform and insignia regulations. In the case of officers, who no longer have epaulets on their work uniforms, and men whose uniform does not permit normal wear of the insignia on a hat (cooks in white, for example), the commander should seek permission to have the insignia displayed on a pocket while in garrison. This insignia serves as a constant reminder to the individual of his link with the unit.

Every soldier should know the heraldic symbolism of his insignia and what historical incidents are represented on it. Pertinent points regarding various aspects of the unit's history make good questions at a promotion board and provide incentive to learn. Commanders could have a history and traditions card printed and could then give it to the men of the unit to carry. These suggestions are only a few possibilities in this regard.

Most of the staff officer's responsibilities in regard to military history are fixed by regulation. Often the information contained in the regulations is unavailable because the young officer doesn't know where to find the regulation. DA Pamphlet 310-10 gives the index to all pertinent pamphlets and regulations.

The regulations which apply to military history at battalion level and below are AR 220-15, *Journals and Journal Files*, and AR 870-5, *Military History — Responsibilities, Policies and Procedures*. DA pamphlets in which the junior officer can find background, examples and requirements in US military history are DA Pamphlet 20-200, *The Writing of American Military History, A Guide*, and, in particular, DA Pamphlet 870-2, *The Military Historian in the Field*. Depending on the staff officer's job, knowledge of these documents and local standard operating procedures should enable him to effect a positive improvement in unit history.

The most important source of historical data at

the battalion level is the staff journal and journal file. Under AR 220-15, every staff section at battalion is required in a combat environment to maintain a staff journal and journal file. The staff journal is familiar to most officers who have had a stint as battalion staff duty officer. It is the chronological record of all important events, locations and messages. The journal file contains all staff journals in chronological order with copies of all message forms, plans and orders alluded to in the body of each journal. What is not as familiar to most officers is the proper preparation of both the journal and file.

The best guide to use in the preparation of a staff journal and its accompanying journal file is whether or not a total stranger to your unit could understand the sequence of events from the journal. An entry referring to Bluejay 74 has little meaning to someone after the pertinent extract from the signal operating instructions has been destroyed.

In the preparation of a journal file, redundancy is the rule. It is better for the researcher to have four copies of the operations order being considered than not to have any because each staff section assumed one of the others was including a copy. Some units produce a unit staff journal based on a compilation of all the staff sections' journals. This technique is effective, as it affords the researcher the opportunity to view the day's significant events from the viewpoints of all the staffs.

The Operational Reports-Lessons Learned (ORLL) is the newest development in the series of command-sponsored periodic digests of unit combat operations. In Korea, the document that served this purpose was known as the command report. Its purpose today is to provide input to ACSFOR and, to a lesser degree, OCMH, on a major unit's operational environment during the quarterly reporting period. The report, for those not familiar with its makeup, is composed of three sections and annexes. The first section is the commander's narrative of the significant events of the quarterly period; the second section is an analysis of lessons learned during operations; and the third section is filled at the direction of the Department of the Army in support of its research programs on any specific subject. The staff sections produce the annexes, which include data on personnel, intelligence, operations and logistics.

The after action report can be another significant source of historical data. The report is prepared periodically at the discretion of the commander or at the request of a higher headquarters. It covers a specific period, such as a short campaign, a major contact, or a large scale movement, such as a redeployment. The report frequently serves as a basis for a unit citation recommendation or as a guide for similar operations in the future. There is no established format for the report; the Operational Reports-Lessons Learned generally serves as a guide in preparation.

Every unit would like everything they do to reflect tactical and technical mastery; however, most commanders and staff officers will admit that many things can be done better the next time. Too often hard-won experience becomes institutional knowledge of only that unit, and others must repeat the mistakes in order to gain the experience.

Junior officers, as primary and assistant staff members, frequently participate in the preparation of both the operational report and the after action report. They should keep a notebook of the type recommended in FM 101-5 and summarize their institutional experience. Only in this way can the ORLL compiled at the end of the quarter, and the after action report written at the termination of an extended operation, reflect the insights gained during the daily operations of the unit. Officers

should "tell it like it is" when they write their portion of a major report or an accompanying annex. Good or bad, the information and conclusions must be as objective as possible. Only objective reporting, which explains the "why", can form the basis for a meaningful historical study.

The Army Functional Filing System is not usually the domain of the junior officer; however, as a staff officer, he is responsible for his section's portion of the permanent and temporary filing system. AR 310-18-1 and AR 310-18-2 prescribe the general procedures of the system and the special procedures on historical files. In addition, AR 340-1 and AR 340-2 will provide procedures specifically applicable to brigade and battalion level. To gain the best knowledge of the system, the junior officer should sit down with his staff NCO or chief clerk and receive a briefing on the set-up. Not only will he learn something, but will probably earn the respect of his subordinate for taking the time out to learn.

Spot checks of files can isolate items which will probably be of historical value. At battalion level, the files which bear careful scrutiny are 2-05, Organizational History Files; 2-06, Daily Journal Files; 2-08, Operational Plans Files; 2-09, Emergency Plans Files; and 2-12, Command Report Files. The junior officer should work to insure that information of value to the historical researcher is not lost from these files.

A select group of officers have the distinct honor of being designated as unit historian. Some are picked because their Form 66 (Officer Qualification Form) shows a degree in history. Others are picked who have not had professional training in historiography. Here are some suggestions for the unit historian:

- Secure a copy of DA Pamphlet 870-2, *The Military Historian In The Field,* and read it. While it is oriented toward the field representatives of OCMH, its section on the unit historian and its description of historical information-gathering techniques are extremely good.
- Find out what has been done before and what the commander desires accomplished. The commander is the key to the historical door. He is responsible for historical programs, and will usually be anxious for you to produce something valuable.
- Use the principle of the leading problem in gathering your information. All leaders' decisions are attempts to cope successfully with the problems posed by the situation. One important use of history in the military is to trace the sequence of the decision making process so that future leaders faced with similar conditions may make the correct choice. In this area, particularly, the rapport you have with the commander can enable you to gather your information directly from the horse's mouth, so to speak.
- Aggressively search out information of historical value. You don't want to create bad feelings and dissention by your search, but at the same time you don't want someone hoarding information of value to all.
- Lastly, write your results in clear, concise English. Leave the flowery language and the jargon to others. It is extremely difficult for the interested,

but uninitiated, for example, to understand that CA can mean both combat assault and civic action in the same document.

Junior officers have a tremendous opportunity to influence the effectiveness of historical documentation. Only by applying themselves can they be sure that the Army's story will be told factually to the generations to come.

AWARD WINNER

ARMOR OFFICER ADVANCED COURSE

CAPTAIN THOMAS E.C. MARGRAVE, commissioned in 1968 from the US Military Academy, has had assignments with Troop D, 10th Cavalry at Fort Knox and the 1st Squadron, 1st Cavalry in Vietnam. He attended the Armor Officer Advanced Course in 1971, and is currently enrolled at Syracuse University before being assigned to the US Military Academy as an instructor.

A professional soldier must be well-informed and up-to-date. Here is the concluding portion of books about armor published since World War II.

Part II

Books about Armor

by Colonel Robert J. Icks, USAR-Retired

Profie Publications in England is producing a series of paperback pamphlets covering the development of important combat vehicles and their variants, each written by specialists from several countries. The series was edited originally by Stevenson Pugh who himself earlier had produced a small book with plenty of illustrations called *Fighting Vehicles and Weapons of the Modern British Army* (Macdonald 1962). Some of these pamphlets were combined and republished in hard-covers as *Armour in Profile* in 1968.

The original series was discontinued after 24 issues and was replaced by a new series having a slightly different format called *AFV/Weapons Profiles*. The new series is edited by Duncan Crow, a former British Armoured Force officer. A bound volume called *Armoured Fighting Vehicles of World War One* was created out of pamphlets from both series, supplemented by additional text and illustrations. Published in 1969, it is the first of a projected seven-volume series to appear over the next several years and to cover in detail the development of the major fighting vehicles of the world. Volume 2, *British AFV's 1919-1940* was published in early 1971. These books, when the series is completed, will represent what is likely to be the definitive source of information on vehicles for some time to come.

Other small books of limited coverage are *British Army Vehicles and Equipment: Parts 1 and 2* by R.E. Smith (Ian Allan 1964), which were revised and appeared again as a single volume in 1968. These are excellent. But the best, by far, of the Ian Allan publications of this size are several by B.T. White. These are the extremely good *British Army Armoured Cars* (1964), *German Tanks and Armoured Vehicles* (1966), and *British Tanks and Fighting Vehicles 1914-1945* (1970). All are well researched. Mr. White also produced *Tanks and Other Armoured Fighting Vehicles* (Blandford 1970), the forerunner of an entire series to appear in the future.

Chris Ellis and Peter Chamberlain, the former a writer and the latter a researcher, have written for British model magazines and also have produced a very good, voluminous and well-illustrated book titled *British and American Tanks of World War II* (Arms and Armour 1969, Arco 1970), a companion volume to a translation of von Senger's *Die Deutschen Panzer—1926-1945* and called simply *German Tanks*. Ellis and Chamberlain also have produced a number of small booklets aptly titled *The Churchill, The Sherman, Modern British Tanks and Fighting Equipment*, and one on British carriers, all published by Arms and Armour Press. Other items are a small booklet *American Armoured Cars 1940-1945* (Almark) and several booklets covering German vehicles (Bellona). Bellona also publishes an excellent series (through No. 24 at the present writing) of scale drawings, descriptive text and a few photos, known as *Bellona Vehicle Prints*. These are written by various authors. Bellona also have done *French Armoured Fighting Vehicles No. 1* by Pierre Touzin and Christian Gurtner, who contribute regularly to French model maker magazines.

Russian armor has also received attention. A companion volume to the large Arms and Armour Press books is J.F. Milsom's *Russian Tanks 1900-1970*. Although it is adequately illustrated, the book's illustrations are small and of poor quality.

Moreover, the text lacks balance, suffering as it does from too literal acceptance of Russian sources which are quoted at length. The *Battle of Kursk*, a Ballantine paperback by Geoffrey Jukes, suffers from the same fault as well as from the poor quality of picture reproduction. *Fighting Vehicles of the Red Army* by B. Perrett (Ian Allan) is a small book whose coverage does not live up to the extravagant claims made for it on the dust cover. Chamberlain and Ellis have a far better book of comparable size called *Soviet Combat Tanks 1939-1945* (Almark).

An American publication, *Red Armor in Combat* (Grenadier 1969) by Martin J. Miller Jr., contains well-known illustrations of Russian armor. It cannot compare in quality of photo coverage with the Japanese paperback *Russian Tanks* by Tadao Shibusawa, published by The Koku-fan, or with John Brereton's *Russian Tanks 1915-1965* (Feist Publications 1970). An excellent summary with many sketch maps describing the Russian victory on the Eastern Front which deals in general with the tactics of the combined arms is *Stalingrad to Berlin* by Earl F. Ziemke (Office of the Chief of Military History, US Army 1970).

Other Japanese books published by The Koku-fan and written by Mr. Shibusawa are *German Tanks*, *British Tanks*, *US Tanks* and *The World Tanks Annual 1971*. There also is a volume entitled *Japanese Armor* in this series by Akira Kikuchi. All are of excellent quality as to illustrations although, unfortunately, the text is in Japanese. Another very good Japanese book is the two-volume set *Japanese Tanks and Armoured Vehicles*. Volume 1 was written by General Tomio Hara and Akira Takeuchi, while Volume 2 was written by General Hara and Denji Eimori (Shuppan Kyodo Sha 1961). Volume 1 was revised in 1969. Although the text is in Japanese, the illustrations are worthwhile.

American Armored Cars by A.J. Clemens (Grenadier 1968) is a paperback book with excellent illustrations which help to fill a gap in the history of this phase of armor in the US. A small book containing a number of new photos and intended as a boys' book is *Combat Tanks* by Colonel G.B. Jarrett (Meredith 1969). Other books of similar hard-cover format have been published in Holland, such as *Moderne Artillerie* in two volumes (Alkenreeks 1968) and *Pantservortuigen* also in two volumes, all by Fred Vos. These are well done but have only limited coverage.

A recent Italian book describes and illustrates many Italian experimental vehicles previously unknown outside Italy. It is *Corazzati Italiani* (d'Anna Editore 1968) by Benedetto Pafi, Cesare Falessi and Goffredo Fiore. *Il Carro da Combattimente* by Guido Giannattini (Tipografico Regionale 1965) is another good book. *Tanks of the World* by Enrico Po is a good soft-cover book on good quality paper and with excellent illustrations. It is distinguished by having Italian and English text in parallel columns.

A Brazilian book titled *Os Blindado Attraves dos Seculos* by Colonel J.V. Portella F. Alves (Biblioteca de Exercito Editore 1966) is one of the few Latin American books which has appeared. Much of it is a rework in Portuguese of the Heigl books.

A small Hungarian book called *Pancelos Csatak* by Nagy Gabor (Kiado 1966) is printed on good paper and contains some excellent armor pictures. However, the official photographic history of the Hungarian Army titled *Nephredseregunk* is better illustrated. The latter is a large book and similar in format to the official history of the Finnish Army *Hsenaisen Suomen Pvolustasvomat* in that it is not entirely devoted to armor. A book published in Finland in 1970, *Suomalaiset Panssarivaunujouket 1919-1969* by Kantakoski, is a well-illustrated history of the Finnish Armored Force.

The privately published *The Water Buffalo* in two volumes (Food Machinery Corporation 1945) gave excellent coverage of the LVT in World War II but the illustrations suffered from offset reproduction on poor paper. The Patton Museum Society Publication No. 1 *History of US Armor* is a good soft-cover summary history and reasonable in price. It touches briefly on the Korean War, but for greater detail, *Combat Actions in Korea* (revised edition) by Russell H. Gugeler (Office of the Chief of Military History, US Army 1970) is worthy of mention. Still greater detail on armor in Korea from the Marine Corps standpoint is *US Marine Operations in Korea 1950-1953* in three volumes by Lynn Montross and Captain A. Canzona (USMC 1954).

Following the Sinai War of 1956, an excellent book appeared in England entitled *The Sinai Campaign 1956* by Major Edgar O'Ballance of the Irish Army (Faber and Faber 1959). One published in

Israel by the War Office in 1964 was *Tank Warfare*, a fine book of illustrations with text in Hebrew. After the 1967 war, one of the best books to appear was *The Six Day War* by Randolph and Winston Churchill (Heinemann 1967). Another was S.L.A. Marshall's *Swift Sword* (American Heritage 1967). Several excellent books also appeared in Israel. One was *The War 1967* (Otpaz Ltd. 1967) in both Hebrew and English, and another was one which was published also in the US as *The Tanks of Tammuz* (Viking Press) by Shabtai Teveth. This book also traces the history of the Israeli Armoured Corps. Although the illustrations are of poor quality, the sketch maps are excellent.

The war between India and Pakistan, together with its long background, are efficiently covered in *The Indo-Pakistan Conflict* by Russell Birnes (Pall Mall 1968), but the maps are inadequate and there are no other illustrations. Somewhat better maps and a number of illustrations are found in an interesting but highly partisan account from the Indian standpoint titled *Twenty-Two Fateful Days* by R.R. Mankekar (Manaktaton 1966).

A recent book, not strictly on armor but one which deals with "the mental state of mobility" that enabled military commanders to be successful in the past 200 years through the Sinai War, is *Alternative to Armageddon* (Rutgers University 1970) by Colonel Wesley W. Yale, General I.D. White and General Hasso E. von Manteuffel, the former German armor commander.

There are many books of a biographical nature which have been published here and abroad and which touch on armor in one way or another, as well as dozens of individual unit histories. However, their numbers are so great as to place them outside the scope of this article.

In addition to the many new books published, a vigorously used book market in armor books has developed. Furthermore, reprints of official manuals and out-of-print books are being made. *The Fighting Tanks Since 1916* of 1933 was so honored in December 1969 by a publisher other than the original (WE, Inc.), and my *Tanks and Armored Vehicles* of 1945 also was reprinted by this publisher early in 1970. They also have reprinted a number of official manuals and other books, including *Tanks Are Mighty Fine Things* by Wesley Stout, one of a series of books published by the Chrysler Corporation after World War II.

More books have appeared on the market during 1971. Carlos Demand, a German aircraft illustrator, has recently published an expensive book of color paintings of armored vehicles. Dott. Nicola Pignato's book has been printed in Italy as *Atlante Mondiale Dei Mezzi Corazzati. Pershing—A History of the Medium Tank T20 Series* by R.P. Hunnicutt (Feist Publications) is a beautifully illustrated book about the history of the *M26* Medium Tank. Colonel G.B. Jarrett's *West of Alamein* (Grenadier) unfortunately was produced without the publisher having submitted proofs to the author for editing, resulting in many typographical and factual errors.

More books are in prospect and should be appearing in 1972. Lehmanns Verlag plans to produce a book on German armored and soft skin vehicles written by W.J. Spielberger. Ellis and Chamberlain in England have more books in preparation. My own *Famous Tank Battles* (Doubleday) is scheduled for publication in 1972, but my *Tracklaying Combat Vehicles* has not yet found a publisher. Colonel Jarrett's *Tanks in Combat* is having the same problem.

Several theses and dissertations written by American scholars to satisfy the requirements for advanced degrees are worthy of publication. "The German Panzerwaffe 1920-1939" written at Northwestern University by Dr. Richard T. Burke of Western Michigan University is scheduled to be published by the University of Oklahoma. Two others which are extremely well researched have not found a publisher. The first is "The Development of American Armor 1917-1940" done at the University of Wisconsin by Timothy K. Nenninger of the National Archives. Several articles based on this thesis appeared in *ARMOR* earlier and more are planned for the future. The second is "Rejection of Christie's Armored Fighting Vehicles" by George F. Hofmann of the University of Cincinnati.

The fascination which armor holds for thousands of people will continue to justify publication of books on the subject for many years to come. But if the past is any indication, it is likely that high publication costs in the United States will cause most of them to be published in Europe and Great Britain.

With the installation of the add-on stabilization system and planned future improvements in mobility and ranging, it can be expected that the *M60A1* tank will maintain its superiority over its Soviet counterparts.

by john g. loridas

tank add-on stabilization

An inertially stabilized main gun resulting from an add-on stabilization kit will greatly enhance the combat effectiveness of this nation's *M60* series tank fleet. With this kit, crewmen will benefit by having a fire on-the-move capability, target acquisition on-the-move, surveillance on-the-move, improved firing accuracy from defilade, and a smoother transition in adapting to future stabilized main battle tanks. Under proving ground conditions, short to medium range fire on-the-move hit probabilities of better than 50 per cent are expected.

Cost of the kit will be relatively small when compared to that of the total vehicle. Adaptation of the kit to existing tank gun control systems can be performed within a period of a few days.

Production of the *M60A1* with the add-on stabilization is scheduled for late 1972. The retrofit of existing *M60* series tanks with the kit will begin within the next few years.

BACKGROUND

During the 1950s, the Soviets designed and installed main gun stabilization on their *T55* tank. This tank comprises a significant proportion of the existing Soviet fleet along with their stabilized *T62* tank.

From 1962-64, American industry, through company sponsored programs, designed an add-on stabilization kit for the *M48* tank. In 1964-65, two competing companies became involved in developing an add-on stabilization kit for the German *Leopard* tank. These two systems were later modified for the *M60* series tanks and were competitively evaluated. One system was selected for continued engineering test/service test (ET/ST) as a result of the evaluation. The factors weighed were performance, simplicity, maintenance, technical documentation offered and cost.

SYSTEM DESIGN

Success in providing an add-on stabilization kit has been based on making available an economical system capable of fitting into the existing *M48A2, M48A3, M60* and *M60A1* tank hydraulic gun control systems with minimal modification. Gun laying and tracking requirements have, therefore, been restricted to the limits of the basic hydraulic power plant and actuating mechanisms. The stabilization system is required to meet all common vehicle systems specifications, such as operation over a voltage range of 17 to 40 volts DC and temperature range of –40 degrees to +125 degrees Farenheit with acceptable performance.

The add-on kit consists of a rate sensor package, control selector box, electronics package, shut-off valve, traverse servo-valve assembly, elevation servo valve assembly, handle shaping assembly, hydraulic filter and an antibacklash cylinder. Most of the components in the add-on system are readily available off-the-shelf items. The gyros are the same as those being used in the *Shillelagh* tracking system and have demonstrated good reliability in numerous applications.

The stabilization electronics box, however, contains five modules of special design. The specifica-

tions for the electronics modules are described by pin function and transfer function where applicable. These modules have their electronic components mounted between two printed circuit boards and encapsulated with potting compound into a solid unit. Thus, they have been designed for simple replacement and to be thrown away when faulty.

The nine basic components making up the add-on stabilization kit weigh approximately 40 pounds and occupy 0.6 cubic feet. The interface hardware consists of brackets, hydraulic tubes and hoses. The electrical harnesses weigh approximately 40 pounds and occupy 1.0 cubic foot.

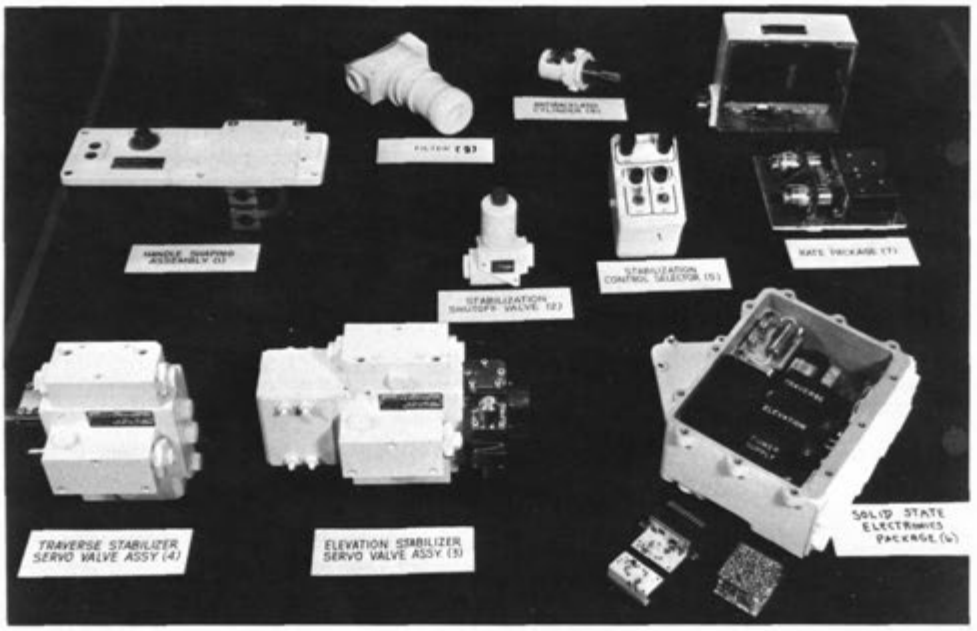
SYSTEM OPERATION

With the stabilization kit installed on the vehicle, three modes of operation are available to the gunner: non-stabilized power mode, stabilized and manual.

In the non-stabilized power mode, the stabilizer shut-off valve is closed and the pressure-operated engage valve prevents the servo valve output from entering supply fluid to the hydraulic motor or elevating cylinder. The gun control system is operational in the vehicle's normal power mode and its performance is governed by the vehicle's standard hydraulic components.

In the stabilized mode, the stabilizer shut-off valve is opened by flipping the stab-on switch on the control box. The pressure-operated engage valve then connects the servo valve outputs to the hydraulic motor and elevating cylinder in parallel with the normal tracking valve outputs. The servo valves deliver flow to the hydraulic motor and cylinder in proportion to the hull motion disturbances sensed by the gyroscope rate sensor package. Elevation and traverse null potentiometers are available on the control panel to null out any excessive drift that may exist in the stabilization system. During stabilized target tracking operation, simultaneous stabilization and tracking performance is provided within the power limitations of the basic system.

Since the rate gyro package inertially space orients the main gun, minor corrections with the gunner's handles may be required due to translation errors incurred when the vehicle is moving. An electrical signal from the handle shaping assembly cancels that portion of the rate gyro response caused by the gunner's handle command. Gunner's handle tracking is, therefore, independent of the stabilization loop which is thereby restricted to correcting for hull motion disturbances.



Add-on stabilization system.

SYSTEM PERFORMANCE

The gun control system with the add-on stabilization kit is capable of meeting the following requirements: azimuth and elevation drift of less than 2.0 mils per minute; 15-second warmup time—time delay for gyro spin-up; final pivot steer retention of less than 5.0 mils; and periscope crosshair time on target of 90 per cent for slow speed tracking with 100 per cent being required at faster tracking rates.

With the present non-stabilized *M60A1* tank, the hit probability when firing on-the-move is essentially zero. Through use of the add-on stabilization kit, the moving vehicle has attained hit probabilities of greater than 50 per cent during TECOM tests on stationary targets. This hit probability figure compares favorable to a hit probability of approximately 70 per cent for the same range and ammunition when firing from a stationary vehicle at a stationary target.

SYSTEM MAINTENANCE

The add-on stabilization kit has been designed for minimal maintenance. Once the kit has been installed and the hydraulic system oil flushed through the filters, no further filtering is required unless contamination is introduced when replacing hydraulic components in the gun control system. A 10-micron nominal, 25-micron absolute filter is placed permanently into the system to capture contaminants generated within the hydraulic system due to general component wear.

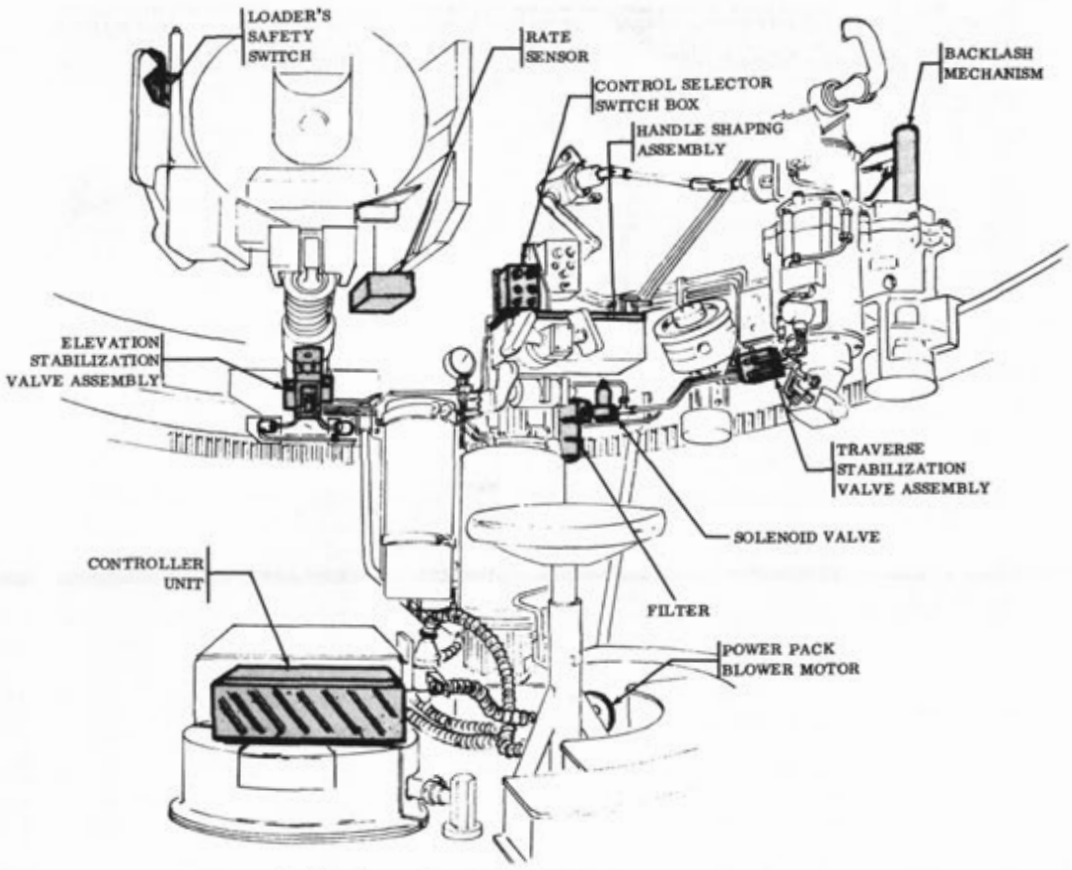
In case of stabilization malfunction, a portable go-no-go test unit is provided to test and isolate the source of fault down to the smallest electronic module.

SYSTEM EVALUATION

Since the system was designed and developed by industry without specific military requirements, the add-on stabilization kit represents a best effort in providing an economical system within the performance restraints of the vehicle's gun control system. Testing acceptance and qualification of the integral system, as well as its parts, has been done through: engineering test and service test (ET/ST) of the system; qualification and reliability testing; math modeling; and electro-magnetic interference evaluation.

ET/ST of the kit was done by TECOM at Aberdeen Proving Ground and Fort Knox beginning in 1966. Deficiencies and shortcomings uncovered during this testing were later corrected. The system was then retested during a check test at Fort Knox in 1969. The system underwent troop test evaluation during 1971 to establish tactics, doctrine, logistics and final acceptance by the user. CDC and CONARC have recommended that the kit be considered for production.

Qualification and reliability testing has been accomplished at the manufacturer's facility. This testing insures a high degree of confidence that the design of the individual components, and the kit as a whole, will meet vehicle environmental conditions such as shock vibration, temperature, humidity and



Stabilization system component location in the *M60A1*.

so on. The results have established firm component and kit tolerance specifications for competitive procurement.

A math modeling effort to describe the functioning of the stabilization kit mathematically has been initiated. Through the use of this tool, it will be determined if adequate phase and gain margins exist in the stabilization kit to prevent undesirable oscillations during system operation. A parametric sensitivity analysis will also be performed by varying stall torque, both coulomb and viscous friction, moment of inertias and loop gain. Satisfactory implementation of the results from the math modeling program into the kit should insure adequate system performance considering vehicle-to-vehicle characteristic variations and component tolerance variations.

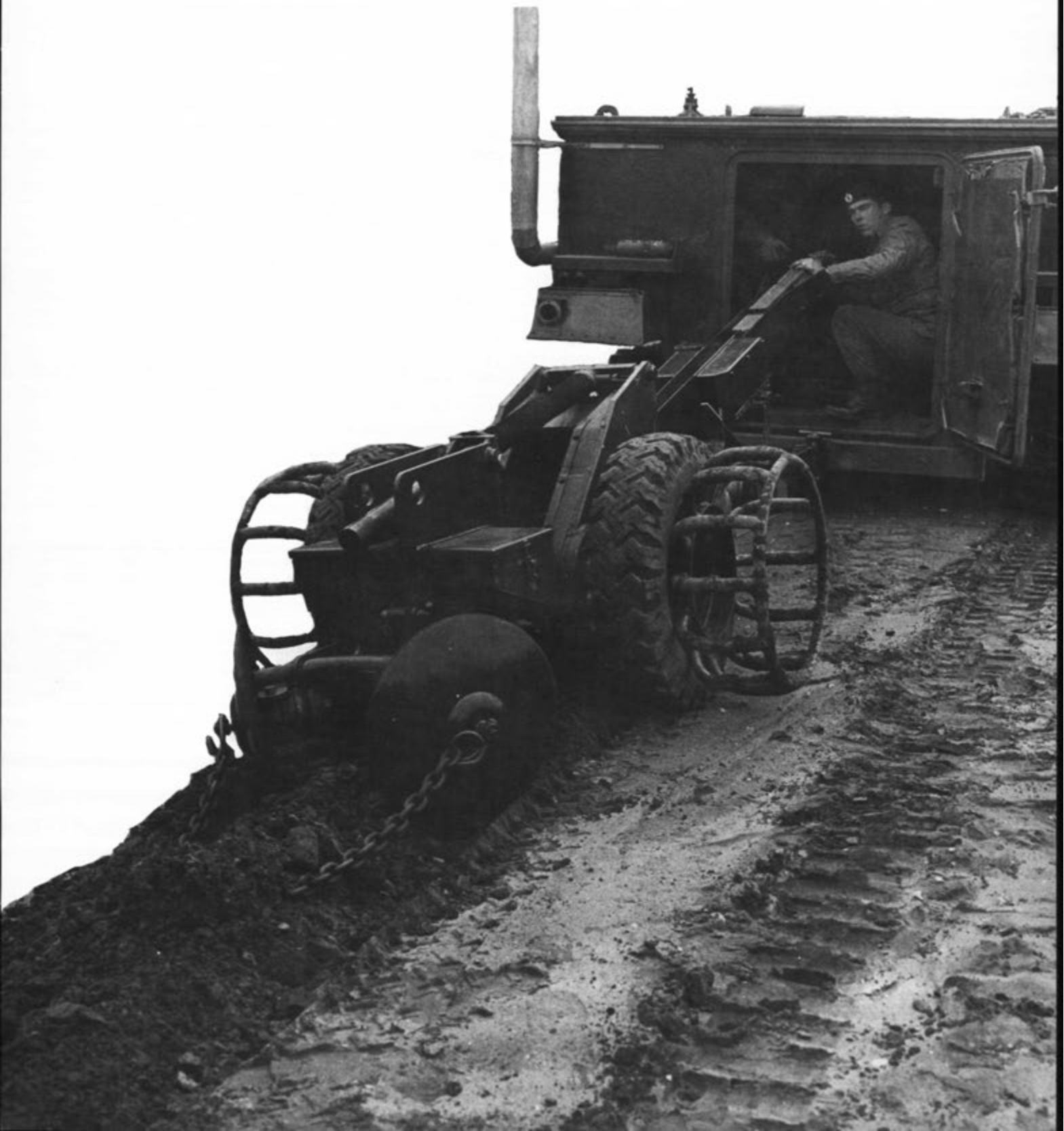
Since the duty cycle of the hydraulic pump motor will be increased due to the more continual operation of the stabilization kit, an electrical power profile for the total vehicle system is being developed. Through the use of this profile, it will be determined if sufficient electrical power is available for all vehicle systems under the most severe conditions in the present configuration, as well as with future product improvements.

Electro-magnetic interference (EMI) studies are scheduled for the future. These will establish vehicle EMI vulnerability, susceptibility, and environment contamination by electrical and electromagnetic interference.

The system will improve combat/cost effectiveness and will be reliable, easy to install, operate and maintain.

JOHN G. LORIDAS, an electronic engineer with the M60 Project Manager's Office at the US Army Tank-Automotive Command, is currently the project engineer in directing and supporting design of gun control systems for the *M60* tank series.

The British introduce a process which allows a four-man crew to quickly and effectively emplace an antitank mine field over a relatively large area.



A Tank Killer . . . A Field Plough!

by Major Homer M. Ledbetter

Mr. Infantry, Tank or Squadron Commander, can you, during the heat of battle, provide for a quick and easily installed antitank minefield across a high-speed enemy avenue of approach 1 to 3 kilometers wide? Once you have determined this need for greater defensive combat power, can you install the minefield in a matter of minutes, or do you completely rule out the idea due to the requirements of extensive time, manpower, equipment and probably the need for engineer support.

One of our NATO allies, Mr. British Battalion Commander, can do it quickly and effectively with minimum engineer support and even exposed to small arms fire. The device, recently developed by the British, is a simple but effective, low cost antitank mine and mine laying system called the *Bar Mine* and *Bar Mine Layer*. This equipment represents a major breakthrough in mine warfare. An inexpensive device resembling, both in function and appearance, a horse-drawn field plough allows four soldiers to quickly fuse, arm and lay a minefield capable of stopping or delaying any known armored vehicle in short order.

This new mine laying machine allows a four-man crew (one vehicle commander and one driver) with little or no engineer training to lay 600 to 700 antitank mines in one hour. The mine laying rate is limited only by the soil conditions, the commander's imagination, the number of APCs available and the supply of mines available. The mine layer is particularly effective in terrain common to NATO.

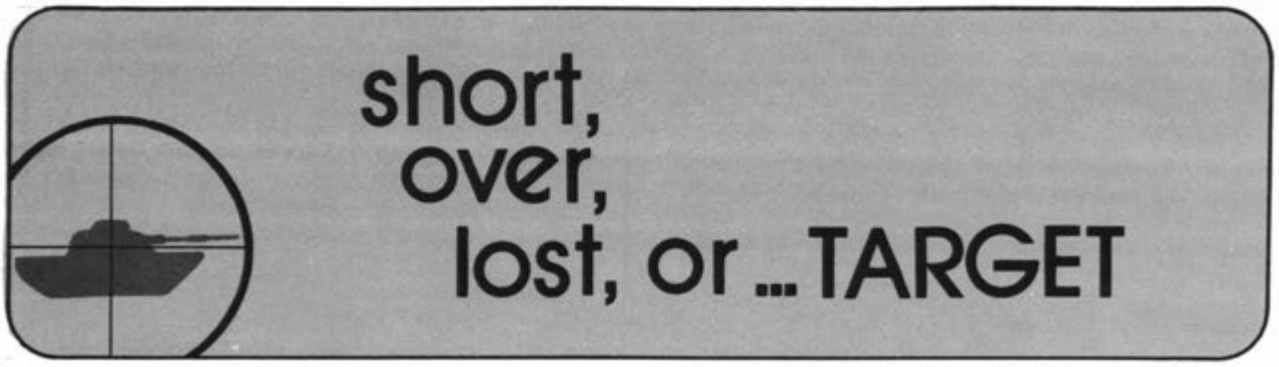
The mine layer is sturdy and simple in construction. There are no complicated hydraulics or electrical equipment, and the parts such as the plough point are quick and simple to replace. The *Bar Mine*, built especially for the mine layer, is made of a strong plastic material with a few small metal parts in the fuse, thus reducing the capability of magnetic mine detectors. Each mine is pre-fused prior to its use and armed automatically in the mine layer.

The mine laying operation is accomplished by placing several hundred bar mines in a *M113*, and then towing the layer, at fairly high speed if required, across the field that provides the armored approach. With the rear door of the APC open, the crew feeds the *Bar Mines* by hand onto a conveyer belt which in turn moves the mine into a furrow provided by the plough blade. The spacing at which mines are emplaced and the depth beneath the surface are adjustable. Once the mine has been placed in the furrow, the plough covers dirt over it. This process will allow the crew to quickly and effectively emplace an antitank mine field over a relatively large area. The simplicity of the equipment and the ease with which operators can utilize it is remarkable in a day dominated by computers and advanced technology.

This equipment, if organic to a NATO tank or infantry battalion or a cavalry squadron, would provide the commander with an extremely simple, quick and effective means of increasing the battalion's combat power, particularly in the mobile defensive role. This mine field, covered by defensive fire, would cause considerable delay to any would-be tank-heavy aggressor.

Congratulations are due the British for their keen one-upsmanship.

MAJOR HOMER M. LEDBETTER, Armor, has commanded two cavalry troops, and advised a Vietnamese cavalry troop. He was an operations officer in the MACV Tactical Operations Center, and currently is an operations officer at Allied Forces Central Europe, NATO.



This department is a range for firing novel ideas which the readers of ARMOR *can sense and adjust. It seeks new and untried thoughts from which the doctrine of tomorrow may evolve. Items herein will normally be longer than letters but shorter and less well developed than articles—about 750 words maximum is a good guide. All contributions must be signed but noms de guerre will be used at the request of the author.* ON THE WAY!!

Improving Redeye Effectiveness

by Captain Alfred T. Bowen Jr.

Presently the Redeye sections in tank and mechanized battalions and cavalry squadrons are mounted in *M151* quarter-ton trucks. This vehicle severely limits the use and effectiveness of the Redeye system. The *M151* is greatly limited in mobility and protection and does not allow the Redeye section to keep up with maneuver units across difficult or fireswept terrain.

Mounting the Redeye team in a light armored vehicle, such as the *M113* or *M114*, armed with an automatic weapon, would greatly improve the performance of the weapon system. An *M113* type carrier allows the teams to remain with the supported units longer, providing much greater protection. It will also give the Redeye team an antiaircraft gun-type capability and a limited ground fighting capability for emergency use.

An example of employment would be the assignment of two teams to protect a bridge, ford, refueling point or any likely air target. These teams would take up four defensive positions. Two missile positions would be set up, oriented against aircraft, and secondarily oriented to complement the gun systems by rifle fire and observation in an antiground attack role. Two gun positions would be established oriented against ground attack, but primarily positioned to complement the missile sites in the antiaircraft role. From these four positions, the two teams would provide all-around antiaircraft defense and limited defense against ground attack.

The systems complement each other. The gun is quick to get into the action, very effective against closing targets, and it is fired from a relatively hard position. The missile is most effective at flank and tail shots. It homes on a target taking evasive action, but it must be fired from an exposed position. When an aircraft attacks a protected location, the gun system engages him while he is making his head-on, relatively stable attack. The aircraft is most vulnerable to gunfire at this point as it must slow down to attack and any evasive action will cause its ordinance to miss the target. When the aircraft passes overhead or breaks to avoid the gunfire, the Redeye team, which has gotten ready to fire under the cover of gunfire, launches their weapon at the flank or tail of the enemy.

The Redeye/automatic gun combination would be complementary, just as the *Chaparral/Vulcan* system is complementary, only on a lower command and cost level. The Redeye and standard automatic cannon *M139* or .50-caliber machine gun, both crewed by trained antiaircraft gunners, make a formidable team.

It has been suggested that the gun capability is unnecessary as the Redeye teams will always be working in close contact with other weapon systems which have machine guns. The proposed system offers several advantages over the guns on accompanying armored vehicles.

First, an armored carrier and automatic cannon would make the Redeye team independent. A commander could drop off a Redeye team to protect an important point without diluting his regular combat forces by detaching a squad or section to protect the Redeye from ground attack. The Redeye team is also capable of limited defense of a position from ground attack by using their armor-protected automatic weapons.

Second, the machine cannon mounted on the unit's regular combat vehicles are more profitably used against ground targets. And the gunners operating the Redeye team's gun system are trained antiaircraft gunners whose primary concern is air defense.

Third, the expenditure of a Redeye on a very low performance aircraft such as a "Birddog," light observation helicopter, or a troop carrying helicopter is expensive and unnecessary. If the team has a simpler and cheaper system available, it can down these types without using its missiles.

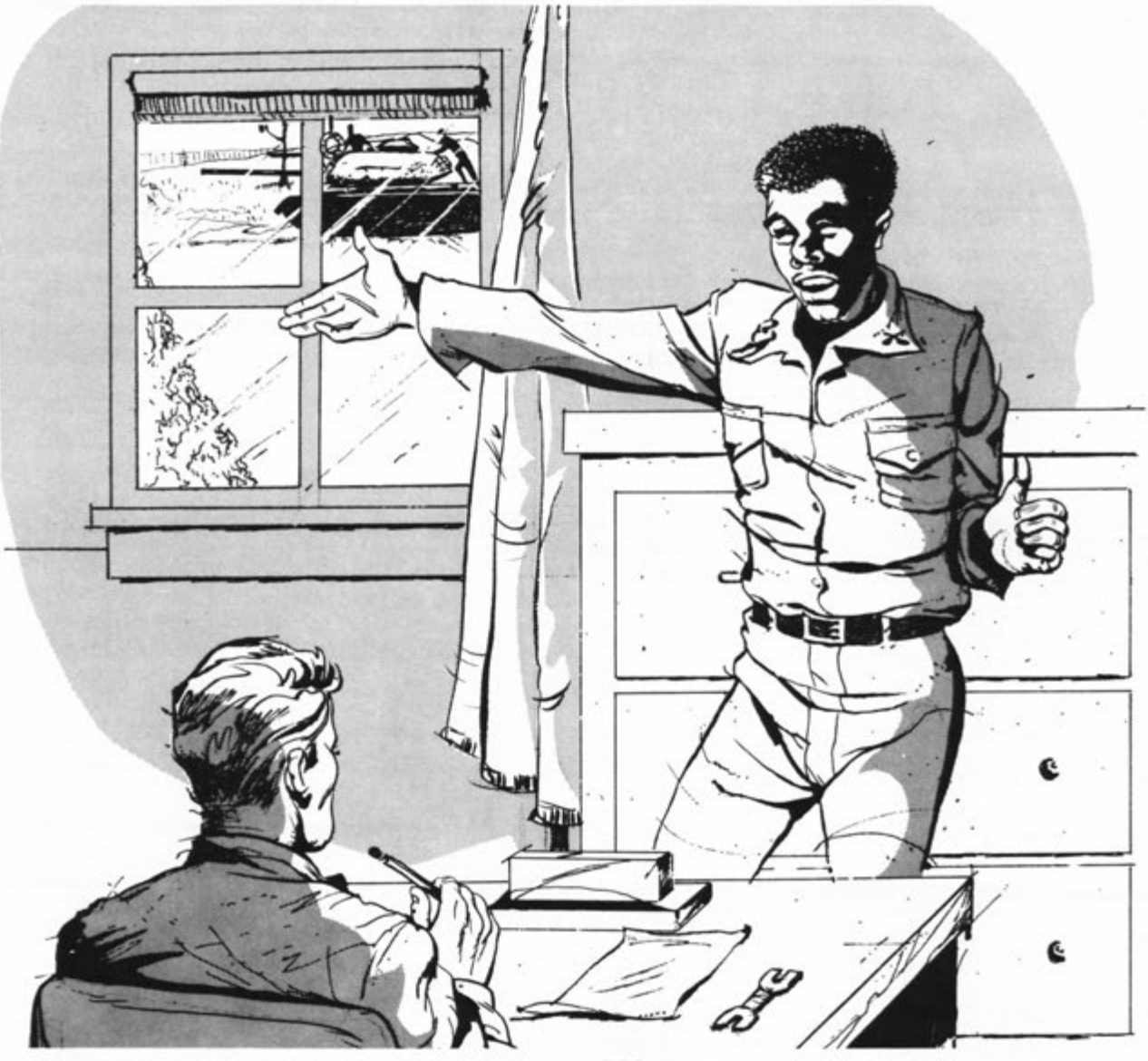
Finally, the addition of a gun system to the Redeye team is only a bonus effect of equipping the team with an armored vehicle capable of keeping up with the armored or mechanized forces.

A Redeye team which cannot remain with its supported unit, which cannot bring its weapons into position to engage the enemy, or which cannot survive in the battlefield at least as well as the units supported, is of no value. The present *M151*-mounted Redeye section has all these failings. It cannot do its job. Re-equipping the Redeye teams with the standard *M113* armored personnel carrier, and in the future, with the Mechanized Infantry Combat Vehicle, would correct all these deficiencies.

CAPTAIN ALFRED T. BOWEN JR., *Armor*, was commissioned in 1966 from Tulane University. He co-authored "The Mechanized Infantry Assault Gun" (January-February 1972, *ARMOR*), and is currently attending Armor Officer Advanced Course 3-71.

How Would You Do It?

US ARMY ARMOR SCHOOL PRESENTATION



SITUATION:

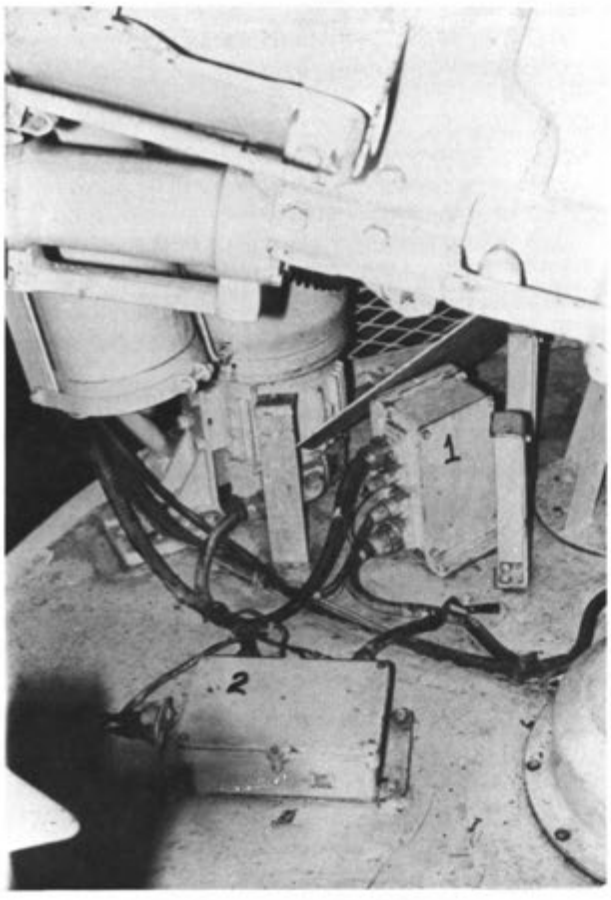
You are the Maintenance Officer, 2d Battalion 10th Armor, 25th Armored Division. The battalion is presently conducting its annual tank gunnery training. The companies have completed the crewman's phase (tables I thru V B), and are standing down for 2 days of maintenance in preparation for starting the crew phase, which begins with the crew machinegun exercise (table VI). Your battalion is the only battalion in the division equipped with the M60 tank.

AUTHORS: MAJ KENDAL L. BAUGHMAN
CPT ROBIN E. MARRIOTT

PROBLEM:

One of the company commanders rushes into your office and excitedly tells you that two of his tanks have no turret power, and that his company will be the first company to fire table VI. He states that his company motor sergeant and one of the battalion turret mechanics have diagnosed the problem as a defective turret power relay (FSN 2590-053-1074). You check with your parts clerk and he tells you that neither he nor the direct support unit has the item in stock, and that it will be at least 5 days before the part could be available and installed in the tanks. How can this problem be solved?

ILLUSTRATOR: ROBERT WILDER



1. TURRET RELAY
2. XENON SEARCHLIGHT RELAY

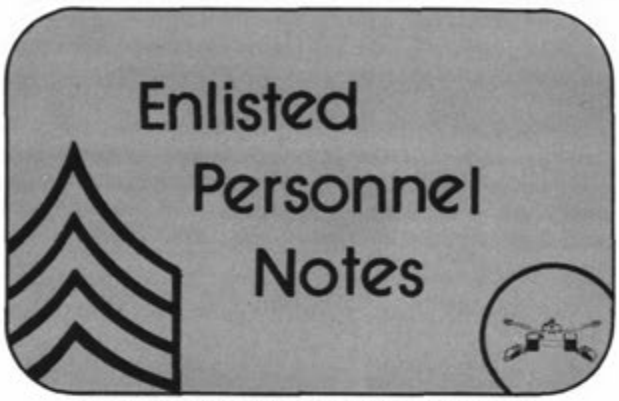
SOLUTION:

As a knowledgeable armor/motor officer this problem is actually quite simple if you apply a system of controlled substitution. You know that an expedient temporary solution is available on the M60 tank by interchanging the defective turret relay with the xenon searchlight relay, since both relays are the same type, and stock number (see illustration). However, before switching the relays you must first receive approval from the battalion commander in order to implement this method of controlled substitution. When the new relays are acquired from the direct support unit they can be easily installed in the tanks.

After the battalion commander gives his approval, and the defective relays are replaced, both tanks are capable of the exercise required on table VI.

DISCUSSION:

The remainder of searchlight tanks within the company should be more than sufficient to accomplish table VI firing. Once the relays are received from the direct support unit they can be easily installed in time for the crews to fire tables VII thru VIII. As illustrated, the two relays are located side by side on the turret floor, directly under the breech end of the gun. Each relay box will need to be removed and reversed because the connecting cables to the searchlight relay box are not long enough to reach the turret power relay. This system of controlled substitution will only work on the M60, M48A3, M48A2C tanks equipped with the xenon searchlight kit. This solution does not apply to the M60A1 tank because the 2 relay boxes have been combined into 1 assembly.



From the Director of Enlisted Personnel

YOUR PREFERENCE

Your preference of assignment is maintained on file at DA and, contrary to popular belief, is considered when you are selected for an assignment. The Enlisted Master Tape Record (EMTR) is the automatic data file for all enlisted men. Your first preference for CONUS area and oversea area of assignment is recorded on the EMTR. Senior enlisted, Military Intelligence (MI) and special category personnel have hard copy files within the Enlisted Personnel Directorate (EPD) which also contain their preferences.

The question is, are the recorded preferences the same on both files and are they up-to-date?

It is common knowledge that one submits a DA Form 2635 (Enlisted Preference Statement) to make his desires known. However, we often overlook the necessary action to insure that the automated file contains this data. Why is that necessary?

Personnel are nominated for assignment by an automated assignment selection system (CAP III) which automatically considers your choice as it is recorded on the EMTR. Therefore, if it isn't there or is incorrect, your current choice cannot be considered in the automated mode.

For E6 and below, your assignment selection system can only consider your choice if that data item is available. If you are overseas, it will be included in the Advance Oversea Returnee (AOR) report. This will update the EMTR. However, as you normally will not have hard copy records in EPD, the only other source for this information is the EMTR.

So what can you do about it?

First off, make sure that your choice for CONUS area and oversea area assignment is correctly entered on your Form 20 in Item 42 (remarks).

Second, if you are being reported on the AOR report, make sure your personnel office has your latest desires.

Last but not least, when you put in a new DA Form 2635, drop by your personnel office so they can record your first choice and update your automated file along with the change to your Form 20.

VOLUNTEERING

Recent articles in this column have encouraged Armor NCOs who have never served in Vietnam to volunteer. Applications for Vietnam reaching DA are being delayed due to incorrectness. Applications must be completed in accordance with AR 614-30. The most common recurring errors are incorrect conduct and efficiency ratings, and the omission of essential statements. Correct ratings are excellent, good, fair or unsatisfactory. Applications containing fair or unsatisfactory ratings should have an explanation for the basis of the rating. The necessary statements to be included are:

> I (have) (do not have) another family member currently assigned in or on orders to Vietnam. I (do) (do not) qualify as a sole surviving son under the provisions of AR 614-75 or for exemption as the result of another member of my family having been killed in or having died as a result of service in Vietnam or another area currently designated as a hostile fire zone.

When either (or both) of these statements is in the affirmative, the following statement must be added:

> I hereby waive my right to retention in CONUS or other oversea area in which I am assigned in order to serve in Vietnam.

Volunteer applications for Vietnam that reach DA correctly will be processed immediately. Do it right the first time and avoid delays.

MOS EVALUATION SCORE INQUIRIES

Individual soldiers desiring information regarding their MOS evaluation scores should consult their local test control officer (TCO) for assistance. Individual telephone inquiries made directly to the Enlisted Evaluation Center, Fort Benjamin Harrison, Indiana, often result in delays in obtaining an answer when the individual does not have sufficient information, such as the TCO roster number and the date that the documents were submitted. Many questions can be answered locally since the Enlisted Evaluation Center provides test results to the TCO as they are processed. The TCO is also notified of any discrepancies in the EER or MOS tests which have been returned for correction.

HOTLINE ITEMS

- Many senior enlisted personnel (grades E7, E8 and E9) send original documents and certificates to the Office of Personnel Operations (OPO) to be filed in their OPO Military Personnel Management File, e.g. DD Form 214 (Report of Transfer or Discharge), civilian and military school diplomas, citations to awards. To preclude these valuable documents from being lost or unavailable when needed by the individual, copies should be made (8 x 10 1/2) and only the reproduction sent to HQDA (DAPO-EPC-SR) WASH DC 20310.
- EPD is currently at the halfway point in a massive project to convert its 110,000 OPO Military Personnel Management Files to a standard file format. This project is being undertaken to improve files maintenance and to insure uniformity among OPO files which are subject to consideration by various DA boards. Every file will be reconstituted prior to being reviewed by a board. In conjunction with the conversion project, approximately 4,000 letters have been dispatched requesting that

missing documents be forwarded to OPO. Career Management Files are maintained on enlisted personnel in grades E7 through E9 and personnel in the lower grades who possess special category MOS.

• Senior grade personnel should periodically review their Enlisted Qualification Record (DA Form 20) to insure that it is correct. Personnel officers are responsible for prompt and accurate submission of reports when DA Form 20 needs updating and/or corrections. If an inordinate number of changes are necessary, it is recommended that a duplicate copy of a corrected DA Form 20 be typed and forwarded to HQDA (DAPO-EPC-SR) WASH DC 20310 for inclusion in the OPO Military Personnel Management File. Senior graders must remember that their career management file has an important bearing on assignment and board decisions made at DA.

• Armor senior noncommissioned officers in MOS 11D and 11E are needed in Europe. Personnel whose last tour of duty was a short tour area and who are interested in an assignment to Europe may submit a volunteer application, under the provisions of AR 614-30, through channels to DA, ATTN: DAPO-EPC-SC.

ARMOR CENTER INNOVATIONS

TV Demonstration of Tactical Briefing

An important fact in the development of a professional officer is his ability to convey ideas in the form of a briefing. To enhance this ability, the Armor School has produced and incorporated into the Armor Officer Advanced Course a closed-circuit TV video tape which demonstrates how to present a briefing. The tape is in two parts. Part I shows the brigade commander and his staff as they brief the assistant division commander on the tactical situation. Part II shows the battalion commander presenting an update briefing to the brigade commander.

In addition to the TV video tape presentation, each student is provided with a briefing guide handout developed by USAARMS. Included in the guide is a format of the situation/update briefing, complete with check lists. The guide is designed to facilitate retention of briefing techniques which were demonstrated while viewing the TV tape, and is to be utilized by the student during later instruction when he is called upon to present briefings.

Helicopters Integrated Into Scout Training

A new dimension in combat training has been integrated into the Advanced Individual Training of the Armored Reconnaissance Specialists, "Scouts", in the 2d AIT Brigade, Fort Knox. This new training is designed to familiarize the student with loading, unloading and safety operations while working with helicopters. The helicopter also lends an atmosphere of realism to the combat patrolling exercise during the student's sixth week of training. It is especially useful in building the confidence of the soldier as he runs through the simulated problems he might encounter in combat.

The current instruction consists of a preliminary briefing of the characteristics and capabilities of the helicopter, safety procedure and preparation for loading. After receiving a patrol order, the students board the aircraft for flight to a predetermined landing zone. During the flight, the students are required to orient themselves on a map from the air so they will be able to move immediately from the LZ to the objective. After neutralizing the objective and completing the mission, the patrol secures a pickup zone and radios for extraction. Aggressor personnel are used throughout the problem to provide action and realism for the students.

If tests of this exercise prove feasible and beneficial to the overall training program, other phases of the scout training in the field will be integrated.

Goer Vehicle Family

A new high-mobility tactical vehicle will be added to divisional tank and self-propelled artillery battalions in the near future. This vehicle is the 8-ton *Goer* family, which will replace the currently authorized 5-ton truck.

There are three models: an 8-ton capacity cargo carrier, the *M520*; a 2,500-gallon tanker, the *M559*, which incorporates a filter/separator to insure that only uncontaminated fuel is dispensed to vehicles or aircraft; and a wrecker, the *M553*, which has a 10-ton capacity boom and a 22 1/2-ton capacity tow winch. All models are diesel powered and have power shift transmissions. Design is based on the technology of the off-road construction equipment industry and incorporates both high mobility and a swim capability. The *Goers* have undergone extensive field testing in Germany and Vietnam.

There are currently 1,300 vehicles on contract with the Caterpillar Tractor Company. Initial production test (IPT) is scheduled to begin in October 1972 and release to the field is anticipated for late 1973.

Vehicle Power Interrupter

An additional measure of safety is present on Armor School *M551 General Sheridan* ranges through the use of vehicle power interrupters. Using these devices, *Sheridan* vehicle instructors can maintain their positions on the exterior of the vehicles, and by remote control cut all electrical power, should a student traverse the gun/launcher out of the range fan, or if an equipment malfunction results in a runaway turret.

A power interrupter, illustrated in figure 1, consists of a 12-foot double strand electrical cable, with a micro switch attached to one end, and two couplings attached to the other. The device is installed between the vehicle's battery and the master relay box.

Installation, illustrated in figure 2, is accomplished by disconnecting the battery-to-relay cable from the master relay box, and connecting the interrupter couplings to the relay box and the battery-to-relay cable. The battery access door is left in the open position, and the cable strung out to the vehicle instructor located on the exterior of the vehicle. The battery access door cover is then closed. A gap in the molding of the vehicle's rear decking surface allows the cable to be placed between the battery access door cover and the rear decking without damage. When the device is installed, power will flow from the battery through the power interrupter to the master relay box. Activation of the micro switch by the instructor interrupts the flow of power to the master relay, thus shutting off all electrical power to the vehicle. Power to the master relay box will continue to be halted until the button on the micro switch is released, allowing current to again flow through the interrupter to the relay. To again provide power to the turret however, the turret control switch, which is located on the gun and turret control selector, must be turned to the OFF position and then switched back on again.

Components required to construct the power interrupter are provided in figure 3. The power interrupter in use within the Armor School is a modification of a design used by *M114* instructors within the US Army Training Center, Armor. Captain Glenn A. Dalton, formerly of the training center, and currently a member of AOAC 3-71, suggested to the chief of the gunnery division, Weapons Department, that the *M114* device be modified for use on the *M551*. The modified design was constructed by Boatwright Field Maintenance, and since February 1971, has been used successfully on all *M551* ranges conducted by the Weapons Department.

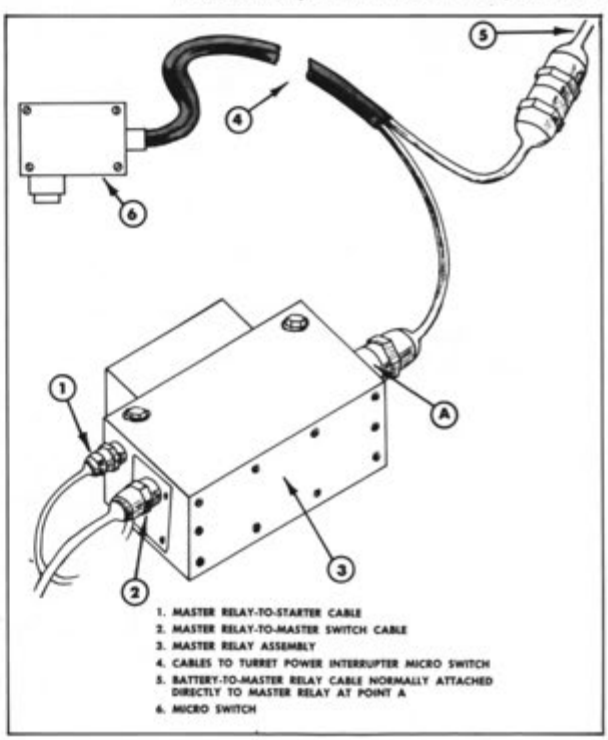


Figure 2. Installation

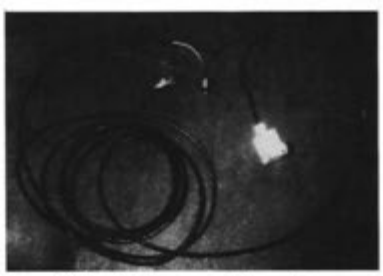


Figure 1. A power interrupter

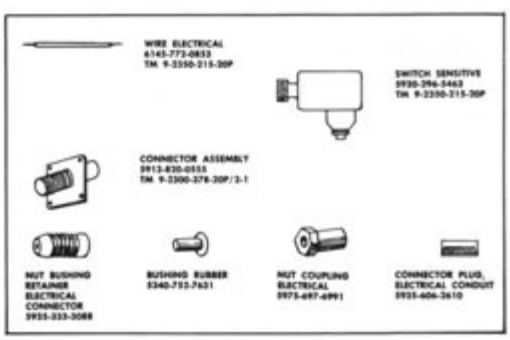


Figure 3. Components

news notes

COLONEL BECTON BECOMES ARMOR BRANCH CHIEF

Colonel Julius W. Becton Jr. has been designated as Chief of Armor Branch. His previous assignment was commanding officer of the 2d Brigade, 2d Armored Division.

Colonel Julius W. Becton Jr.

A graduate of Prairie View A & M, Colonel Becton has had assignments with the 93d Infantry Division; 2d Infantry Division; Office, Chief of Staff; and commanded the 2d Squadron, 17th Cavalry in Vietnam.

Colonel Becton has graduated from the Command and General Staff College, the Armed Forces Staff College, The Institute for Defense Analysis, and the National War College. He holds a master's degree in economics from the University of Maryland.

From the Armor Branch Chief *will continue in the next issue of* ARMOR.

INACTIVE DIVISIONS DESIGNATED HOME STATIONS

A plan for designating division posts as home stations for inactive Regular Army divisions has been approved by Department of the Army. The home stations will act as custodians of division distinguishing flags and guidons, and for selected memorabilia for the purpose of keeping alive the history, tradition and achievements of the divisions.

The following is a list of inactive divisions and the home station to which they will be assigned:

Division	Station
4th, 5th, 8th Armored	Fort Knox, Ky.
5th, 10th Infantry	Fort Carson, Colo.
6th Armored	Fort Leonard Wood, Mo.
6th Infantry	Fort Lewis, Wash.
7th, 11th Armored	Fort Polk, La.
7th Infantry	Fort Ord, Calif.
9th Armored, 9th Infantry	Fort Riley, Kans.
10th Armored	Fort Gordon, Ga.
11th Airborne, 12th, 14th Armored	Fort Campbell, Ky.
13th, 17th Airborne	Fort Bragg, N.C.
13th Armored	Fort Hood, Tex.
24th Infantry	Schofield Barracks, Haw.
66th Infantry	Fort Rucker, Ala.
69th Infantry	Fort Dix, N.J.
71st Infantry	Fort Benning, Ga.
92d Infantry	Fort McClellan, Ala.
93d Infantry	Fort Huachuca, Ariz.

In addition, duplicate division flags will be provided to the following museums:

Airborne—82d Airborne Division War Memorial Museum
Armor—Patton Museum of Cavalry and Armor
Infantry—US Infantry Museum

PATTON MUSEUM FUND-RAISING DINNER

More than 800 people attended the fund-raising dinner held at the Convention Center in Louisville for a new Patton Museum of Cavalry and Armor.

Among the special guests were Senator Hubert H.

Actor George C. Scott speaks to the guests at the fund-raising dinner.

Humphrey, actor George C. Scott, Major General William R. Desobry, Armor Center commander, Brigadier General George S. Patton, and retired General James Van Fleet, who was a commander of United Nations forces in Korea.

Young officers at the dinner wore old-time cavalry hats and sabers, and exhibits from the Patton Museum

George C. Scott is shown here with Brigadier General George S. Patton, son of the famous general.

were on display. The car that Patton was riding in when he was killed was also on display.

General Patton, in remarks at the dinner, said, "As you can imagine, it's been quite an emotional evening for me. And, I'm sure that the Patton ghosts are in this hall tonight."

George C. Scott, who won an Academy Award for his portrayal of the general's father in the movie "Patton," said, "I feel compelled to thank a man I feel very close to—though I never met him."

Mr. Scott and General Patton had met for the first time earlier on the day of the dinner, and the general took the actor on a tour of the post, including the present museum.

CAPTAIN GEORGE AWARDED DISTINGUISHED SERVICE CROSS

Captain Robert A. George was awarded the Distinguished Service Cross by Major General William R. Desobry in ceremonies held at Fort Knox. Captain George of the 194th Armored Brigade was awarded the medal for heroism connected with ground actions against a hostile force in Vietnam.

3D CAVALRY– FIRST ALL-RA REGIMENT

This poster printed early last year was an indication of what was to come on 16 December 1971, when the number of RA troopers assigned to the 3d Armored Cavalry plus those who have enlisted for the regiment totaled 2,267, seven over the 3d Cav's authorized strength.

THE CAVALRY RIDES AGAIN

Out of the pages of history, the US Cavalry rides across the plains of Fort Sam Houston, Texas. This vanguard of our present day air cavalry squadron is being reconstructed at Fort Sam Houston by a group of young men dedicated to the proposition that this part of our rich heritage shall not be forgotten.

They call themselves Troop A, 4th Memorial Cavalry Regiment of Texas, or when representing the Confederate States of America, the 7th Texas Cavalry (Frontier).

The organization is striving to maintain a troop of cavalry which will be uniformed and equipped in the

Troop A, 4th Memorial Cavalry Regiment

manner of the US Cavalry stationed in Texas and the Territory of Mexico during the Indian Pacification Period 1861-81.

The troop, presently consisting of fifteen members, has a two-fold objective: To further enrich the heritage of the American Southwest by authentically recreating the role of the 4th Cavalry of Texas in dealing with the Indian problem in the 1880s; and to train and equip the troop so that it is capable of making appearances in parades, demonstrations, historical pagents, ceremonies and motion pictures.

COLONEL PLUMMER COMMANDS 3D ARMORED CAVALRY REGIMENT

Major General Alexander R. Bolling, commanding general of Fort Lewis, presents the colors of the 3d Armored Cavalry Regiment to its new commander, Colonel Walter W. Plummer, 53d colonel. Colonel Plummer, whose former assignment was Assistant Secretary of the General Staff, Office, Chief of Staff, US Army, succeeded Colonel Kenneth W. Koch, who is now the Fort Lewis chief of staff. At center is Master Sergeant Lucius T. Fowler.

the tarpaulin

Covers a bit of everything gleaned from the service press, information releases, etc. Contributions are earnestly sought.

TAKE COMMAND

MG James F. Hollingsworth, III Regional Asst Cmd, RVN . . . **BG Howard G. Garrison,** New York Emergency Operations HQ . . . **COL Walter E. Adams,** 3d Bde, 1st Armd Div . . . **COL James W. Dingeman,** 4th Bde, USATCA . . . **COL Robert W. Fisher,** DISCOM, 3d Armd Div . . . **COL Charles M. Grandelli,** Cmdt, HQ School Cmd, Ft Lewis . . . **COL Jess B. Hendricks,** DISCOM, 2d Armd Div . . . **COL James H. Leach,** USAREC Spt Unit, Cameron Station . . . **COL Leonard L. Lewane,** 1st Bde, 1st Armd Div . . . **COL Garland McSpadden,** 2d Bde, 2d Armd Div . . . **COL Glen K. Otis,** 1st Bde, 3d Armd Div . . . **COL Walter W. Plummer,** 3d Armd Cav Regt . . . **COL Claude L. Roberts Jr,** 24th Eng Gp (Const) . . . **COL Thomas E. Wesson,** 13th Spt Bde, Ft Hood . . . **LTC Charles W. Andy,** 6th Bn, 32d Armor, 194th Armd Bde . . . **LTC Lewis E. Beasley,** 3d Sqdn, 1st Cav, 1st Cav Div . . . **LTC John D. Borgman,** 1st Bn, 13th Armor, 1st Cav Div . . . **LTC John C. Bovard,** 16th Bn, 4th Bde, USATCA . . . **LTC James L. Dozier,** 2d Sqdn, 4th Cav, 1st Armd Div . . . **LTC Thomas D. Fluker,** 1st Bn, School Bde, USAARMS . . . **LTC Edward P. Hart,** 3d Bn, 35th Armor, 1st Armd Div . . . **LTC John P. Heintz,** 3d Sqdn, 8th Cav, 8th Inf Div . . . **MAJ C. Powell Hutton,** 3d Bn, 68th Armor, 8th Inf Div . . . **LTC James R. Klugh,** Cml, 502d S&T Bn, 2d Armd Div . . . **LTC Luther R. Lloyd,** 1st Bn, 33d Armor, 3d Armd Div . . . **LTC Marvin G. O'Connell,** 2d Sqdn, 14th Armd Cav Regt . . . **LTC John F. O'Connor,** 1st Bn, 210th Armor, NYARNG . . . **LTC Glenn H. Pohly,** 4th Bn, 63d Armor, 1st Inf Div . . . **LTC Donald W. Pulsifer,** 4th Bn, 37th Armor, 194th Armd Bde . . . **LTC Fred B. Raines,** 2d Bn, 63d Armor, 1st Inf Div . . . **LTC William O. Staudenmaier,** FA, 2d Bn, 59th FA, 1st Armd Div . . . **LTC Arthur R. Stebbins,** 1st Bn, 1st Bde, USATCA . . . **LTC Gerson J. Subotky,** 10th Bn, 5th Bde, USATCA . . . **LTC Gerald L. Welling,** 1st Sqdn, 10th Cav, 4th Inf Div . . . **LTC Robert N. White Jr,** 1st Sqdn, 6th Armd Cav Regt . . . **LTC Charles W. Zipp,** 2d Bn, 64th Armor, 3d Inf Div . . . **MAJ Keith Copeland,** 48th Med Bn, 2d Armd Div . . . **MAJ William E. Whitworth,** 155th Avn Co (Atk Hel), Ft Ord . . . **CSM Lawrence T. Hickey,** Cmdt, 7th Army NCO Acad.

ASSIGNED

BG Clay T. Buckingham, DCSOPS, DA . . . **BG Alfred B. Hale,** ADC, 1st Cav Div . . . **BG Frederick C. Krause,** XVIII Abn Corps . . . **COL John R. Byers,** OJCS . . . **COL Jack Cranford,** Dir, Dept of Maint Tng, USAAVNS . . . **COL Ernest J. Davis,** DCSPER, HQ 1st Army . . . **COL Thomas B. DeRamus,** DCSPER, DA . . . **COL William K. Gearan,** Mil Asst, USofA . . . **COL Angelo Grills,** J5, OJCS . . . **COL Ernest F. Jacobs,** Arms Control and Disarmament Agency . . . **COL Kurtz J. Miller Jr,** HQ 6th Army . . . **COL Fred R. White,** ODCSINTEL, HQ 5th Army . . . **LTC Donald C. Becker,** MPC, PM, 3d Armd Div . . . **LTC Allan R. Bissett,** DRDS, British Embassy . . . **LTC Thomas E. Carpenter,** AVCofSA, HQ DA . . . **LTC Robert A. Carr,** Office of the Surgeon, DA . . . **LTC Richard L. Coffman,** ACSFOR, HQ DA . . . **LTC Joseph D. Dyan,** GI, 1st Armd Div . . . **LTC Vernon E. Ebert,** XO, 1st Bde, 2d Armd Div . . . **LTC Joseph A. Langer Jr,** Armor Asgmt Off, Colonels Div, OPD, OPO . . . **LTC Ralph L. Lehman Jr,** USACDCARMA . . . **LTC Stanley J. Lobodinski,** MPC, PM, Ft Knox . . . **LTC Stephen E. Nichols,** HQ USEUCOM (J3JTF) . . . **LTC James M. Rapkock,** HQ USAREUR, DCSOPS, Exercise Div . . . **LTC William D. Ray,** USAAVNS . . . **LTC Mitsuo Sakayeda,** HQ III Corps . . . **LTC Rodney W. Spotts,** TACOM . . . **LTC Donald J. Valz,** Chief, Ops Div, Cmd and Con Directorate, MASSTER . . . **LTC William B. Wash,** Cbt Sys Gp, Ft Leavenworth . . . **LTC William P. Willette,** XO, 2d Bde, USATC . . . **LTC Philip J. Zeller,** PM, 89th Div (Tng), USAR . . . **MAJ Sylvester C. Berdux,** REDCOM, MacDill AFB . . . **MAJ James H. Britton,** 3d Sqdn, 12th Cav, 3d Armd Div . . . **MAJ John Sherman Crow,** University of Alabama . . . **MAJ Sabin J. Gianelloni,** 1st Bde, 1st Cav . . . **MAJ Marvin C. Goff,** 3d Bde, 8th Inf Div . . . **MAJ Fred D. Hollibaugh,** HQ, USARJ . . .

MAJ Warren H. Shiroma, 1st Sqdn, 3d Armd Cav Regt . . . **MAJ Edward N. Voke,** 1st Bn, 63d Armor, 1st Inf Div . . . **SGM F. Degaray,** 3d Bde, 3d Armd Div . . . **CSM Bobbie R. McGuire,** 5th Bde, USATCA.

VICTORIOUS

The 1st Armd Div Armor Leadership Award Company for FY1971 went to **C Company, 4th Bn, 35th Armor,** commanded by **CPT Dennis E. Firestone,** with **Herman Jessie** as First Sergeant. CPT Firestone's company was also designated high company in the division on the FY1972 TCQC . . . **CPT Thomas Staadt,** Air Cav Trp, 3d Armd Cav Regt, has been named as recipient of the Mountain Rescue Association's Regional Public Service Award for 1971 . . . **Ft Knox** won the 1st Army flag football championship . . . Recent inductees in the Ft Benning OCS Hall of Fame included: **COL Joseph M. Gay Jr** and **COL Fletcher W. Boles** . . . The **3d Bn, 68th Armor** was high battalion in tank gunnery in the 8th Inf Div at the annual shoot at Grafenwohr . . . The **3d Armd Cav Regt** has been honored by the Washington State Adjutant General for in-service recruiting for reserve components. The 3d Cav sent 203 men to Reserve and National Guard units during a recent 90-day period . . . **Miss Pamela Maurer,** daughter of COL John A. Maurer, Chief of Staff, 2d Armd Div, was crowned Killeen's 1972 Junior Miss . . . **CPT Peter P. Wallace** and **CPT V. Paul Baerman** were selected by the George Olmsted Foundation as Olmsted Scholars. CPT Baerman will attend the Graduate Institute of International Studies in Geneva, and CPT Wallace will study at the Institute of Political Studies in Paris . . . Military Wife of the Year winners: Ft Hood, **Vivian Jean Rosenbrock;** Ft Knox, **Eddiemae Wagg;** Ft Leavenworth, **Sally Mills Good** . . . **SP4 Glenn L. Noland,** 2d Bn, 50th Inf, has been named the outstanding soldier in the 2d Armd Div . . . Honor Graduates of AOB 4-72 were: **CPT's Charles M. Seitz, Bruce D. Foster, Louis E. Schantz, William Wiggins** and **2LT Graham A. Parks** . . . Distinguished Graduate of AOB 5-72 was **2LT Richard C. Fenstermacher;** Honor Graduates were: **2LT's Bantz J. Craddock, Tony A. Issacs, Kevin H. Rorke, Donald B. Rowland** and **CPT Charles M. Borman** . . . Distinguished Graduate of AOB 6-72 was Marine **2LT Keith D. Peterson;** Honor Graduates were: **2LT's Kerry A. Buckley, Joseph A. Cich, William C. Townsend, Jessee L. Adkins** and **Mark D. Reckase** . . . Distinguish Graduate of Motor Officer Course Number Four was **CWO John R. Anderson;** Honor Graduates were: **2LT's Kenneth I. Sutherland, Kenneth R. Piernick** and **Thomas Mierzejersko** . . . The first class to graduate from the Trackmaster course at Ft Carson had as its Honor Graduate, **SGT Charles E. Harris;** Distinguish Graduates were: **1Lt Edward W. K. Hodenpel** and **SFC Lucio E. Mata** . . . **SSG Seral L. Lay** was Distinguish Graduate of Turret Maintenance Course Four . . . "Off-year" election winners included National Guard members: **CPT Paul T. Jordan,** 5th Sqdn, 117th Cav, chosen as Mayor of Jersey City, New Jersey; **MAJ Ivan W. Gilt,** 1st Bn, 246th Armor, Councilman-at-Large in Sawagiac, Mich; **MAJ Francis M. Murphy,** S3 of the 107th Armd Cav Regt, named to the Auora, Ohio Council.

AND SO FORTH

The **US Readiness Command** has been established, replacing US Strike Command. **GEN John L. Throckmorton** is commander-in-chief of the new command with a mission to exercise control of assigned Continental US-based, major-combatant, general-purpose forces and thus provide a reserve force for other unified commands . . . The Army has claimed the **world helicopter sustained altitude record** of 36,711 feet for its **Sikorsky CH54B** flying crane helicopter . . . **CPT Harold A. Fritz,** Medal of Honor winner from the 11th Armd Cav Regt and member of the Armor Association Executive Council, is now assigned to the Command and Staff Department, USAARMS . . . Another Medal of Honor winner, **CPT Frederick E. Ferguson,** is currently attending AOAC 2-72 . . . The five **H34 "Choctaw" helicopters** remaining in the Active Army inventory were recently retired in cermonies at Ft Rucker . . . Ft Carson helicopters have just completed carrying their 1000th patient through the **MAST program** . . . A **horse platoon for the 1st Cav Div** will soon be a reality. They have recently signed for 10 horses from the Modern Pentathelon Team . . . The **5th Armd Div Assn** will hold its 26th reunion in Minneapolis 10-12 Aug . . . **LTC Mark Chirnside** is the new British Liaison Officer at Ft Knox . . . **1Lt Thomas P. Keating** received the broken wing award for successfully landing an *AUH1B* without damage to the aircraft . . . The first General George Casey Memorial Scholarship was presented to **Cindy Radcliff,** daughter of the late MAJ Donald Radcliff . . . **8th Cav Regt Assn** will have its 22d annual reunion at Edwardsville, Ill 14-16 Apr . . . **E. J. Ducayet** has been named chairman and **James F. Atkins** elevated to president of Bell Helicopter Company . . . **Fourth Cav Assn** will hold their reunion 10-12 Aug in Rapid City, S.D. . . . **Clarence W. Pratt,** president of the Ft Knox National Bank, has been elected a director of the Association of Military Banks . . . The **Mk3** version of the **Chieftain main battle tank** has recently entered service with the British Army . . . **LTC Martin F. Manning,** USMC representative to the Armor Center and Armor School, recently presented the only running *Ontos* in the US to the Patton Museum. The *Ontos* is a multiple 106mm recoilless rifle, self-propelled antitank weapon . . . **Two convicts at the Raiford, Fla prison** made recent headlines when they constructed their own tank for a daring escape. They covered a fork-lift truck with 10-guage sheet-metal that deflected tower guards' bullets as they rammed thru the prison gates in their homemade, bullet-proof tank . . . The Buffalo Soldiers laid stake to new territory at Ft Carson recently. The **1st Sqdn, 10th Cav** has joined the 4th Inf Div (Mech), taking over from the 4th Sqdn, 12th Cav . . . **Hy Horowitz** is the president of the 7th Armd Div Assn. The 7th will hold their 1972 reunion 17-19 Aug at Winston-Salem, N.C. . . . The **3d Armd Div Assn** will gather in Chicago 20-22 Jul.

from the bookshelf

THE PATTON PAPERS I:1885-1940

by Martin Blumenson. Houghton Mifflin. 1,024 pages. $15.00.

The story of the warrior and, more especially, the man.

Martin Blumenson has performed a monumental task in analyzing and presenting—both by quotes and by impartial summarization—the vast amount of original material contained in 122 file cabinets containing diaries, journals and correspondence. Blumenson has presented the good along with the bad. Out of this effort there emerges a clear picture of Patton the man and the warrior. Also shown is a keen insight of the inner workings of the Army during the early 1900s, WWI and the interim years. A first-hand look is presented on the origination and development of the "Tank Corps."

Out of 1,000 pages of careful and apparently unbiased presentation, there emerges a clear picture of what motivated Patton toward greatness. Many would not agree with his self-centered approach to the Army and to life. However, this is not the important thing. What is important is what this man accomplished for the Army, his Nation and the world.

Blumenson's prologue alone is worth the price of the book. It is well written and to the point. It is indeed the frame for the picture that is so carefully painted in the text that follows.

Blumenson evaluates (in part) Patton by saying:

> He was unpredictable, capricious, at the same time dependable, loyal. He was brutal yet sensitive. He was gregarious and a loner . . . . He displayed . . . an astonishing mixture of arrogance and humility. He was driven by ambition, tortured by self-doubt.
>
> He was moody, temperamental, savagely profane and easily moved to tears. He flared up in anger for no apparent reason and was immediately and abjectly contrite. He was subject to uncontrollable rage and the next instant tendered his sincere apology. He said things on the spur of the moment that he later regreted. Impatient, sometimes querulous, he would show immense kindness.
>
> Horseman, hunter, racer, steeplechaser, football player, swordsman, sailor, polo player, student, writer, poet, pilot, and above all, soldier, he yearned for perfection and never quite reached it. He strove for recognition and was never sure he had earned it. He searched for glory and was certain it had passed him by. He wanted desperately the plaudits of his countryman, sustained, unreserved and unstinting; and doubted that he merited any. Unless he sits watching from a cloud in heaven or a steam bath in hell, he never knew how much praise he received.
>
> What sort of man he was, what impelled him to achievement, what thoughts, beliefs, convictions he had, what impressed him, he himself revealed in his Papers. They show, and particularly in his early years of preparation, a man of enormous sensitivity, perception, compassion. They record his self-depreciation and self-doubt . . . . They underscore his complete focus on himself—he was the center and substance of his universe.

The Patton Papers, as presented by Blumenson, reads like real life "fiction." It is essentially a compilation of unaltered direct quotes "salted" with good summaries and interpretations by Blumenson. It is interesting and fast moving; it is true. The contents reflect the thoughts and impressions of one man at one point in time. The book is much more than a

chronology of events and letters. The author's use of the "flash forward—flash back" technique maintains reader interest. A caution for the reader—Patton's spelling is atrocious. So after digesting the Papers, it takes considerable thought and a handy dictionary to get back on the track.

Blumenson presents, in an interesting and quite personal manner, the reasons for Patton's initial choice of cavalry (upon graduation from West Point), his selection of the Tank Corps in World War I, and his subsequent return to the horse cavalry. He describes in detail how General Patton was torn between supporting mechanization versus the horse cavalry during the interim years, and his eventual return to the theory and practice of mechanization for large formations. Though his basic reason for these actions may have been self-aggrandizement—the end results were all for the good of the Army and the Nation. Regardless of which side of the fence he was on, Patton never deviated from his belief in the overriding importance of mobility, speed, surprise, shock and the soldier. "Men not machines win battles."

There are, however, a few inaccuracies in Blumenson's interpretation of armor doctrine as executed in World War II. For example, General Patton had stated in 1927, "In the future, it will be better to have tanks follow the infantry over the front . . . and then deploy ahead for the passage through the delaying area." Blumenson asserts that, "This would be the normal procedure in World War II. . ." This assertion simply is not correct—at least not universally so.

Blumenson's recapitulation is a superb job of historical interpretation of what had occurred to one man, a man of destiny, during a period spanning many decades. Let it be clear though that Patton wrote this book. It is to Blumenson's credit that this impression comes through so clearly.

After reading this book, this thought comes to mind. How could a man have so much time for letter writing and recording of events (all self-centered) and still do a job for the Army? The answer is probably due to a number of factors, not the least of which were unabounding energy, devotion to his family, a sense of history and the importance of the written word.

Whether military or civilian, anyone concerned with history, psychology, leadership, motivation will profit by reading *The Patton Papers.*

Major General Arthur L. West Jr.
USA-Retired

To sum up then, you must be: a horse master; a scholar; a high minded gentleman; a cold blooded hero; a hot blooded savage. At one and the same time, you must be a wise man and a fool. You must not get fat or mentally old, and you must be a personal leader.

G2: INTELLIGENCE FOR PATTON
by Brigadier General Oscar W. Koch with Robert G. Hays. Army Times Publishing Company. 167 pages. 1972. $4.95.

Because of its modest size and title, this book is destined to be overlooked by many who should read it and reread it. It is billed as a personal account of the stewardship of Brigadier General Oscar W. Koch, who during World War II was G2 for General George S. Patton Jr., first in Africa, then in Sicily, and finally in Europe.

But it is more than a personal memoir. For General Koch had a unique skill—he was a dedicated professional combat intelligence officer. And in his service to Patton, he brought to peak efficiency the integrated employment of the tools, techniques and innovations available to the professional combat intelligence practitioner.

Nearly thirty years have passed since the events of his opening pages, but it is striking how little we have added to his bag of tricks in the intervening years. From aerial photography to prisoner reports, he used all means to develop his appraisal of the enemy—and did it perhaps more effectively than we have been able to do since.

Patton apparently trusted Koch implicitly. The latter's straightforward answers to Patton's questions about enemy potential to interfere with a Patton scheme of maneuver suggest that both presumed Koch's ability to read the enemy mind, divining his intentions. Not so. For Koch was a staunch believer in a full, thorough and perceptive analysis of enemy capabilities—he says so time and again; he believed it and he practiced it. Knowing this, the two men, commander and G2, knew that Koch's short, direct answer represented his best estimate of what the enemy could or could not do.

Alone, among those viewing the enemy situation in early winter 1944, Koch predicted the German attack capability that developed in December in the Ardennes. Even though the enemy buildup was not in the Third Army sector, Patton's G2 watched it carefully, for it was on the Third Army flank. And at least in part, the spectacular response by Third Army, once ordered into the enemy penetration, reflected Koch's thorough knowledge and continuous analysis of the enemy threat developing to the north of Third Army. It was perhaps the high point in the distinguished career of a tremendously professional man.

The other highlight that stands out in his book is Koch's dedication to his commander, and a reciprocal feature, his commander's implicit trust in his dedicated staff officer. This mutual respect is essential. How many times does one hear it said that, "He's his own G2." He can't be and still be a good commander today, any more than he could in Alexander's time, or in the Wilderness, or in the Ardennes. And so there has to be not only a blending of personalities, but there must first be an unmistakable professional competence on the part of the intelligence staff officer.

In time of peace, combat intelligence activities are neglected for want of a real enemy to stimulate the system; the G2/S2 passes out maps, conducts security checks, and sometimes becomes an assistant G3/S3. General Koch speaks of this regretfully, and warns of how difficult it is to build the capability and train the personnel after the fact. He spent his between the war years studying the panoply of combat intelligence. One wishes he could have written more on the techniques and mechanisms he designed and used to integrate the diverse means he brought to bear on divining the capabilities of the enemy.

Also, either he or Patton himself developed the idea of the use of mechanized cavalry as a direct source of front line information about friend and foe for the Army commander. This bypassed intermediate division and corps headquarters to the consternation of commanders there, but it gave Patton the information he needed to act early based on direct knowledge of events at the front of the lead column. This little commented on facet of Patton's technique of command appears in the official account of the Third Army campaign in Brittany; General Koch alluded to it again, and as before, one wishes he had written more.

General Oscar Koch was a contemporary of my father; the two were good friends for more than forty years. I first knew him as an advisor to a National Guard unit in which my father served, and later as I followed the Guard to summer camp, I knew him at his station at Fort Riley. He was commandant of the Ground General School at Riley when I reported as a newly commissioned second lieutenant to attend that school. There we renewed the acquaintanceship begun so many years before.

I had almost forgotten his account of his years with Patton which he spoke of to his new lieutenants as their school commander, until I fought in Vietnam. Then, how many times flying over the inscrutable jungle looking for the elusive foe; how many times as we plowed through sixty-foot bamboo and 300-foot trees looking for five-foot men hiding in six-foot holes in the ground did I wish we all had paid more attention to Oscar Koch. For the longer we were at it, the more I came to realize the absolute truth of his profound belief in the necessity for the meticulous assemblage and careful, perceptive interpretation of all possible sources of information by a skilled professional combat intelligence officer.

Finally, as we fanned out into Cambodia in hot pursuit of an elusive foe, word came that he had lost his gallant fight against cancer. And so his book will have to answer the questions I wanted to ask him in person. For the lessons of which he speaks are timeless, yet require relearning in every war. And the standard he set was exemplary. He was a real pro and a great gentleman; we have need of his like today and will have again and again.

Brigadier General Donn A. Starry

FLYING ARMY—The Modern Air Arm of the US Army
by W. E. Butterworth. Doubleday & Co. 196 pages. 1971. $9.95.

The author has been a part of the events which he records. Familiarity with these events and the people involved posed obstacles few writers of history can vault—culling the relevant from the irrelevant, and remaining completely objective. A successful solution to this problem can produce history with unique insight. Otherwise, the product can at best be fascinating recollection.

"Flying Army" is the latter. In it Mr. Butterworth has recorded his own observations and those of his many friends during a period when Army aviation was growing up. To the other thousands who were touched by these events, reading his book will be a satisfying experience. To the historian sifting the literature for insights into this significant sector of recent military history, this book will provide a few valuable footnotes. To the student hoping to understand the significance of the growth

of Army aviation and the forces directing and moving it through this period, he will discover the need for much deeper research. Accordingly, if you read "Flying Army" as a chronicle of a discerning involved observer, I am sure you will enjoy it.

The book sparkles momentarily in its foreword and epilogue. In these segments the author describes combat assault in Vietnam, viewed through the eyes of the chopper pilot. In sandwiching his view of history between the reality of aviation's recent role in warfare, the author establishes perspective. Past events must be viewed as they relate to the contemporary condition. Without the reality of air assault and the clear potential of airmobility, Rucker, its people, and its aircraft would be considerably less relevant. At this stage in history, they are very relevant and Mr. Butterworth does a service in bringing to us his recollections of all three.

The author worked with the men at the Aviation Center at Fort Rucker who were to manage the building of airmobility forces. He faithfully recorded their plans, accomplishments and observations. In addition, he knew the pioneers in the aerospace industry who turned their backs on the conventional and made the helicopter work. He undertakes to clarify for the reader the awesome engineering problem which they faced. He also watched the decisions being made in Washington which transformed Army aviation in the early 1960s. Interestingly, his vantage point was still Fort Rucker—figuratively looking up the pipe.

Predictably, he allows local conjecture to substitute for the real background to key decisions in assessing their significance. This in itself makes interesting reading since important events have many facets which others involved fail to observe. For example, looking into the author's facet, the Howze Board and airmobility tests are of peripheral interest, while the flight evaluation of the Italian *G91* was a significant occurrence in advancing Army aviation's role.

Considerable space in the book is allotted to description of Army aircraft from the *Birddog* to the *Cobra*. Airplane buffs will enjoy matching knowledge with the author on performance and characteristics of some of the old birds, and even on those that didn't make it. While scoring a few points in nit-picking his descriptions of the choppers, I went down in flames on the subject of fixed wing.

If the treatment of the Aviation Center and description of the aircraft left something to be desired, the matter of people is entirely different. Sooner or later, everyone of importance to aviation passes through Fort Rucker. Mr. Butterworth missed few, and it is when he is talking about people that he does his best. People, not events and things, are the attractions of his book. Those mentioned will enjoy reading about themselves. Those who knew them will enjoy the reminiscences as well. The kind words about fine men add charm to this book and for this the reader will gladly overlook an historical inaccuracy, a misintrepretation or even an occasional oversimplification.

Colonel William K. Gearan
OUSofA

THE BLACK MILITARY EXPERIENCE IN THE AMERICAN WEST. by John M. Carroll. Liveright. 591 pages. 1971. $17.50.

The growth and contribution of the black man in uniform is vividly related in John Carroll's collection of well-documented historical monographs, letters and assorted papers published in "The Black Military Experience in the American West." Although the book deals primarily with the four black regiments formed in 1866, it begins its epic history with Estenanico, the Black Conquistador, and the story of York, Lewis and Clark's black "passport" through the West. Carroll's collection of more than 60 art works by such noted artists as Frederic Remington, Charles Russell, Paul Rossi, Stanley M. Long, Lawrence Bjorklund and others adds a special flavor to the story of the "buffalo fighters." Seldom have the fictionalized versions of "how the west was won" included the fact that the enlisted soldiers of the 9th and 10th Cavalry and the 24th and 25th Infantry were black. In effect, Carroll's publication is their story in particular and the black man in uniform in general.

It is a sensitive story of how certain black men, recently freed from slavery, basically unemployable, made their contribution to their country's growth. Their major forte was their ability to fight Indians, a dichotomous act in view of the fact that they were now suppressing the freedom of another minority race—The American Indian. When they were not combating the red man, they were convoying wagon trains, controlling crowds, building roads, fighting fires, serving as policemen; all for a government that considered them as "basically inferior." There were 18 Medal of Honor winners in the four black regiments.

"What is past is prologue." The serious reader cannot help but be struck with a certain amount of stark frankness which some of us would prefer to forget. Our government's inhumanity to the Indians and our "punitive expedition" into Mexico reflect a less than glorious period of our history. With the benefit of 20/20 hindsight, they were downright disgraceful. The Brownsville Affray is another nightmare that both the black and white citizens would just as soon forget. The citizens of Idaho would probably like to dismiss from their minds the anarchic happenings on the 4th of July in 1892 when a mob of strikers and union sympathizers in the Coeur D'Alene mining district spat upon and riddled the American flag with bullets. Mr. Carroll knitted a central theme throughout his masterpiece with the skill of a true artist. In each case, the black soldier was intimately involved.

The 591 page volume is also a collection of well-documented, yet lesser known facts, which heretofore were either vague in their credit line or totally unacknowledged. A black interpreter was at the Little Big Horn. The 9th Cavalry fought Pancho Villa. It was personnel from the 10th Cavalry that captured Geronimo. The 25th Infantry fought Sitting Bull. Lieutenant Henry O. Flipper was not the first black man to attend the USMA, but probably was the highest placed black in the government when he served as an assistant to the secretary of the interior. Charles Young, the third black graduate from West Point, transferred to the all white 7th Cavalry in 1896 where he served for one year. Many more such bench-markers are included.

Of particular interest to those of us who are professional soldiers is the remarkable manner in which Mr. Carroll has captured the story of cavalry and clearly portrayed the fact that its principle weapons are surprise and guts. Regardless of the odds, ranging from as little as two to one to more than 100 to one, the cavalry attacked. Seldom did the troopers outnumber the Indians. An example of the almost unbelievable courage displayed and privation suffered is the chapter by Colonel M. L. Crimmins about "Captain Nolan's Lost Troop on the Staked Plains." It portrays cavalry's

tradition and its will to survive. While on a scouting mission in search of hostile Indians, Captain Nolan's troops from Fort Concho, San Angelo, Texas became lost and "they were without water for nearly four days and nights and managed to keep alive by drinking the blood of their dying horses". . . "The blood made them sick, and they drank their (own) urine sweetened with sugar, and some drank the urine of the horses."

Mr. Carroll has performed a distinct service to history by the publication of this book. He has put into perspective the unique role of the black trooper of 100 years ago. As he stated in one of his 10 insightful sectional introductions, "the black troops often found themselves faced with two enemies, the Indians and white settlers. Indeed, the troopers found they frequently needed protection from the very civilians they had been sent to protect."

While it is true that portions of this publication may offend a particular pet smugness of some readers, each will be better off having read it. As Carroll states: "For better or worst, the four black regiments had been created to aid in the pacification of the West. It was a Herculean task that was undertaken with hard work, sacrifice and bravery. The black soldiers of the 9th and 10th Cavalry and the 24th and 25th Infantry earned their honored place in American History."

Colonel Julius W. Becton Jr.

PERSHING—A History of the Medium Tank T20 Series
by R. P. Hunnicutt. Feist Publications. 240 pages. 1971. $16.50.

This is a beautiful book—a real collector's item for anyone even mildly interested in the development of modern military weapons. It is profusely illustrated with photographs, drawings, diagrams and charts. It is the result of ten years of patient research and study by the author and is a complete and authentic history of an interesting phase of World War II.

The book traces the history of the *M26* medium tank through the various stages of development of the *T20* prototype series to its entry into combat in the closing weeks of World War II in Europe. It also follows the tank to the Pacific area and combat in Korea. A few were sent to Okinawa but arrived too late to participate in combat.

The first United States troops to enter the Korean conflict were equipped with the *M24* light tank. This tank proved totally inadequate to cope with the *T34* Russian tank being used by the North Koreans. A number of *M26* tanks were shipped in a crash program directly to Korea from the United States. These proved most effective in the tank versus tank role on good terrain, but the low power-to-weight factor greatly restricted their mobility and effectiveness against the more agile *T34* in the difficult Korean terrain. Eventually the old reliable *M4 Sherman* with 76mm gun took over the tank role in Korea.

Continuing product improvement, the *M26* with improved power plant and transmission emerged as the *M46 Patton*. With a new turret and range-finder, this soon became the *M47*. A year later, the *M48* appeared with characteristics similar to the *M47* but with a one-piece cast hull and a new rounded turret. This tank, the final evolution of the *T20* series, became the standard medium tank of the US Army.

The author describes rather briefly the battle between the Ordnance Department, the Armored Force and the Army Ground Forces over the proper role of the tank. The effect of this argument greatly hampered the development of the kind of tank the forces in the field were begging for. According to the author, Army Ground Force doctrine, throughout the war, insisted that tanks were not expected to fight tanks. The antitank role was assigned to the artillery and tank destroyer units, the latter being the brain-child of Lieutenant General Lesley J. McNair, commanding general of Army Ground Forces. On the other hand, the Armored Force and the Ordnance Department believed that the best anti-tank weapon was another tank.

Fortunately, the insistent demands of the combat-experienced users in the field prevailed to the extent that development proceeded on a tank which would be able to stand up to the German *Tiger* tank on fairly even terms.

It is interesting to recall that in some of the more battle-tested armored divisions, the tank destroyer elements were almost completely integrated into the medium tank battalions in the same manner the light tank companies (*M5* and later *M24*) were absorbed.

Shortly after World War II, it was finally accepted that tanks must be able to fight enemy tanks and for this purpose they had to be suitably armed. This put an end to the independent Tank Destroyer Command whose existence had immensely complicated the development of tanks and obscured the need for arming tanks with adequate guns.

Anyone reading this splendid book cannot help but be concerned at the effect of obstinate, even ignorant, inflexible adherence to doctrine by bureaucratic policy makers far removed from the battlefield. This reviewer feels that even today, personal prejudices and inflexible theories held by those who determine policy, too often conflict with combat-proven experience.

General I. D. White
USA-Retired

THE VANTAGE POINT: Perspectives of the Presidency 1963-1969
by Lyndon Baines Johnson. Holt, Rinehart & Winston. 636 pages. 1971. $15.00

Neither history nor perspective is this monstrous potpourri of data, incidental information and rationalization about the Johnson presidency. Data are deployed ostensibly to demonstrate progress or fulfillment in Johnson-initiated programs. Incidental information is provided in profusion to no apparent purpose at all—the precise time of arrival at Andrews on returning from a trip, and the subsequent minute of arrival at the White House certainly lend no perspective on the highest office in the land.

But the book is fat with this—stuffed by the ghost writers with calendar entries whose relationship to the mainstream of things is, for the most part, completely obscure. Rationalizations abound—it isn't worth the effort. But if one were so inclined, it should be possible to tote up every public criticism levelled at Lyndon Johnson and to find it dealt with somehow, directly or indirectly in this book.

Those who wait for an objective appraisal of Johnson's stewardship from any vantage point can settle back and continue the vigil—this isn't it.

DAS

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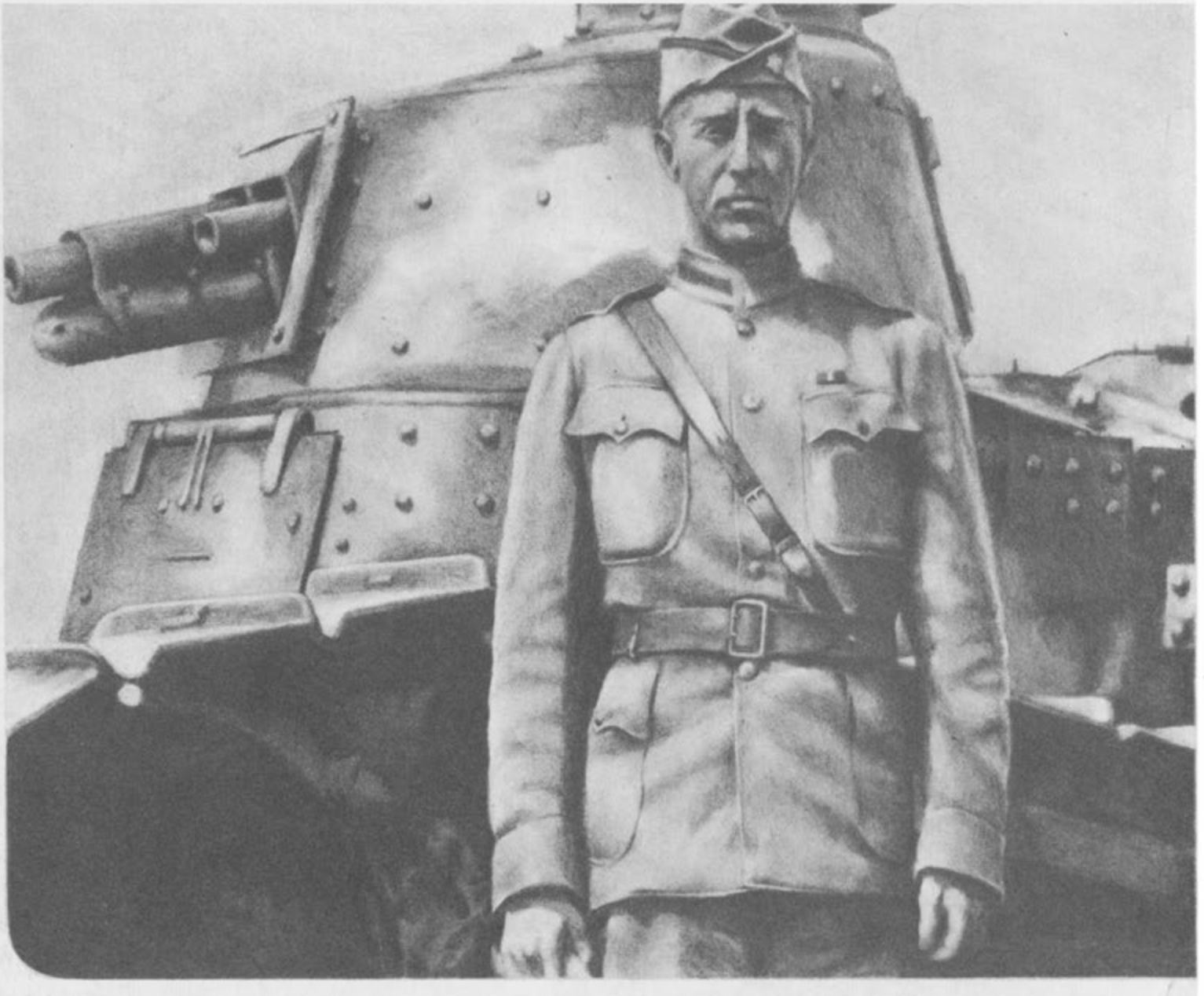
By Ward Just. This book is now being widely discussed. There is much disagreement on whether it is for or against the Army, fair or unfair, true or untrue—in whole or part. It is must reading for the Army man of today. 252 pages.



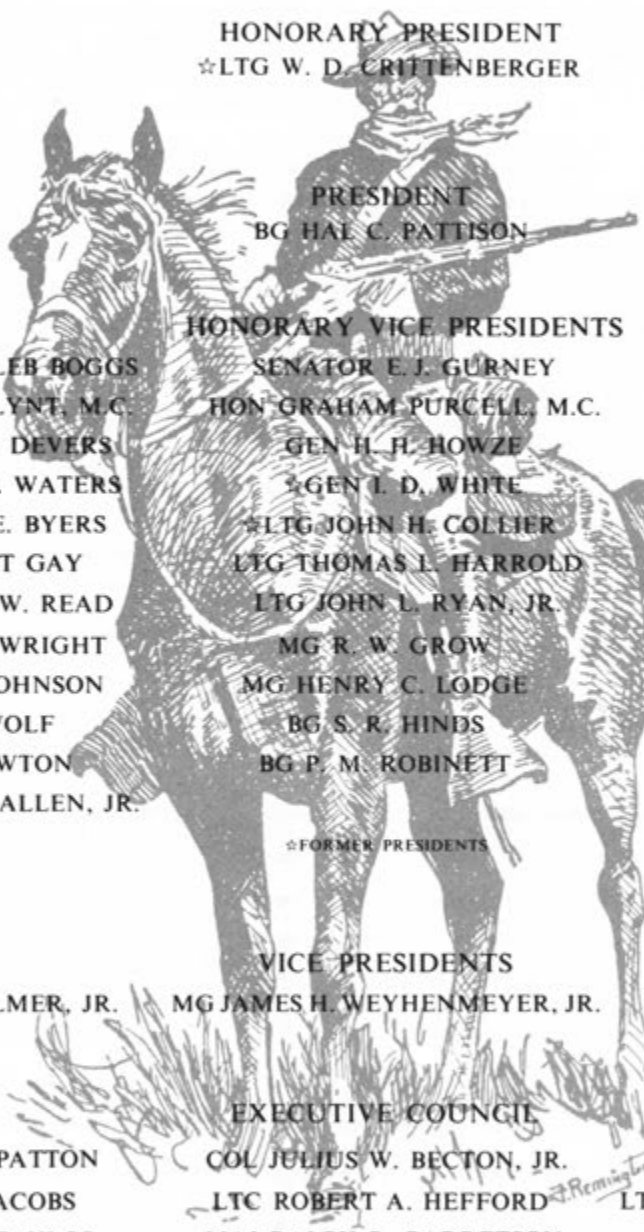
ARMOR

MAY-JUNE 1972

THE UNITED STATES ARMOR ASSOCIATION

Established 1885 as The United States Cavalry Association

"To disseminate knowledge of the military arts and sciences, with special attention to mobility in ground warfare; to promote the professional improvement of its members; and to preserve and foster the spirit, the traditions and the solidarity of Armor in the Army of the United States"—Constitution.



ARMOR

the Magazine of Mobile Warfare

Volume LXXXI **May-June 1972** **No. 3**

ARTICLES

FEATURES

DEPARTMENTS

ON THE COVER . . .

One of the more unique ways nations have honored their armor forces and leaders has been through stamps.

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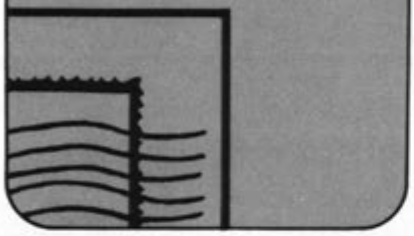
letters to the editor



More on "The Death of the Tank"

Dear Sir:

I am sure that you expected to receive some criticism as a result of publishing the lead article in the January-February issue titled "The Death of the Tank." Personally, I disagree with the author but I cannot criticize you for publishing it. Hopefully, it may inspire others to submit articles both for and against this philosophy, as well as other possible controversial subjects.

However, I do feel that some criticism may be justified because of the undue prominence accorded the article—especially the title being displayed on the cover and the cover design. Such prominence could very easily be misconstrued as agreement with the conclusions of the author by *ARMOR* and even by the US Armor Association. Of course, this is not the case, but some of your readers may jump to that conclusion.

I am all for maintaining reader's interest and inspiration by including controversial subject matter, but let's not give the wrong impression to our members or to those who question the value of *Armor*, or even those who would be only too happy to see the end of it.

I.D. WHITE
General, USA-Ret.
Honolulu, Hawaii 96816

Dear Sir:

Having read "The Death of the Tank" in the January-February issue of *ARMOR*, I feel compelled to express my disdain.

If the author chose the title in order to market his article like a new breakfast cereal, I forgive him. If the editor selected this article for the purpose of provoking indignant protest by its readers, I accept his motive.

The author does not at all succeed in supporting his lugubrious title. He merely lists the several, already well-known, vulnerabilities of the tank. Colonel Lennon accomplishes one thing only, by reiterating what all AFV enthusiasts already know—the current configuration of the tank will change; as has the infantry rifle, the airplane, artillery and all other martial hardware.

Perhaps the erudite colonel could entertain the readers of *ARMOR* with another article "The Death of the Infantryman"—because of the machine gun, artillery and antipersonnel mines. These weapons did not outmode infantry.

Colonel Lennon's sensational title is defused by the colonel himself in his subheading "What of the Future." "Vehicles which can carry heavy firepower . . . highly mobile weapon systems . . . fast cross-country vehicles to strike at the enemy from the flank. . ." The good colonel has just described a weapon in existence—the tank!

The article does point up, inadvertently, one of my theories—the recoiling cannon is obsolete. One more point—the colonel should not discount hovercraft so confidently. In my opinion, this will be the armored fighting vehicle of the future.

The October 1971 issue of The Royal Tank Regiment's "The Tank" stated that only 4 per cent of the very heavily infantry-minded Australian Army is armored troops. Colonel Lennon is in his proper environment!

MILTON H. SHERMAN
White Plains, New York 10605

Dear Sir:

The article by Lieutenant Colonel Warren W. Lennon, "The Death of the Tank," in the January-February 1972 issue was thought-provoking and informative; our US Congress is obviously in agreement with his theory.

Recently, a newspaper article announced that Congress had vetoed the appropriations for continuance of the *XM803* program. The article quoted an unnamed Congressman as saying, "the era of tank warfare is over." As if to belie the Congressman's statements, the same paper also carried a picture of an Indian Army task force moving into Pakistan. This task force was armor (tank) heavy!

Of course, I welcome the technology and genius which is producing some very impressive tank killer weapon systems. These prototypes and models of antitank missiles and aerorocket platforms are needed advances in our antitank weapons family. However, until all of these sophisticated weapons have been adequately proven in combat, we must rely upon tanks to stop a large scale enemy armor attack. I may be mistaken, but current doctrine still designates the *tank* as the best *antitank* weapon.

If those who have been so quick to bury the tank had queried members of the Israeli, Arabian, Indian or Pakastani Armies, they would have reached a different conclusion on the effectiveness of the unsophisticated and outmoded tank.

Ever since Leonardo da Vinci first sketched out his concept of a tank, skeptics have been attempting to cast it aside for various reasons. However, if the tank is dead and tank warfare is over, someone has forgotten to inform the Israelis and Indians.

Now, if only the Soviets could be made to believe that their tanks are not sophisticated enough to be employed on today's battlefield!

JIMMIE B. QUINN
Captain, Armor
APO San Francisco 96222

The Armored Reconnaissance Scout Vehicle

Dear Sir:

The "Armor Center Commander's Update" in the January-February issue of *ARMOR* contained a statement which has prompted this letter.

Major General Desobry said that the performance criteria for the Armored Reconnaissance Scout Vehicle (ARSV) had been provided to industry without specifying the type of vehicle, i.e. track or wheel.

If the cavalry scout or any armored reconnaissance element is to be effective in Europe or on European-like terrain, track vehicles are automatically excluded. A track vehicle, no matter what the state of the art, generates unacceptable amounts of noise from both drive mechanism and track-to-ground contact. Any type track vehicle has an unmistakeable radar signature. While a track provides better going ability in many instances, the sacrifice of stealth precludes scout mission accomplishment.

At present, the armored cavalry regiments are muddling along as best they can with the *M114A1E1* and its *M139* 20mm gun which, in fact, has turned the scout into a mini tanker. What we want and need is a small, wheeled, highly mobile, easily maintained, quiet vehicle capable of swimming with no preparation and with a land speed of at least 60mph. It should be lightly armored to protect the two-man crew from small arms and artillery fragments. It should have a simple weapons system capable of defeating like vehicles at ranges less than 1,000 meters. It should not be designed as a tank killer.

Until such a vehicle is available, the *M151A2* jeep would be vastly superior to the present vehicle for the purposes of the scout on any type battlefield.

GARY W. PICHON
Captain, Armor
APO New York 09146

Patton Museum

Dear Sir:

We are presently attempting to add to the Patton Museum's uniform collection. If any of your readers are willing to donate any of the following items, it will be greatly appreciated.

Cotton ODs— Breeches, shirts, belts, caps, trousers, campaign hats, hat cords, insignia, chevrons, mounted leggins, etc.

Wool ODs— Same as above, plus overseas caps, garrison caps, GI spurs, enlisted cavalry laced or three buckle boots.

GI halters, bridles, tie ropes, holsters, horse blankets, surcingles.

We also extend a cordial invitation to all to stop by the Patton Museum of Cavalry and Armor where they are always welcome.

HENRY B. DAVIS JR.
Curator
Patton Museum of Cavalry and Armor
Fort Knox, Kentucky 40121

Attention Seventh Cavalry Officers

Dear Sir:

Could *ARMOR* Magazine help us in establishing liaison with officers of the old Seventh Cavalry and immediate past commanders of the Seventh Cavalry Association?

The Custer Battlefield Historical and Museum Association, Inc. for two decades has aided the officials at Custer Battlefield National Monument by the purchase of scenic easements, equipment used in the interpretive activities, and in many other ways. It is held in the highest regard by the heads of the National Park Service.

This Committee was selected at the Annual Meeting of the Association to start activities for the One Hundreth Anniversary observance of the Battle of the Little Big Horn. The Committee was directed to contact former members of the Seventh Cavalry and the Sioux and Cheyenne Indian Tribes and request that they help us with the planning of the observance, which is tentatively scheduled for June 24-26, 1976.

Any assistance you can give us will be appreciated.

MIKE REYNOLDS
Chairman
Custer Battle Centennial Committee
Hamilton, Montana 59840

Adjustment of High Velocity Tank Ammunition

Dear Sir:

The high velocity of APDS and HEAT ammunition for the *M60* tank improves our ability to destroy the enemy with the first round, but has created difficulties in adjusting fires if the first round is not a hit. Our primary goal must be the attainment of a first round hit, but we recognize that this will not always be achieved.

In a recent letter to the editor, Lieutenant Colonel John C. Bahnsen expressed doubt as to the validity of applying burst on target (BOT) with high-velocity ammunition, and proposed the two-tank method of adjustment as an alternative. This method was described in an excellent article by Lieutenant Colonel William D. Carter in the November-December issue of *ARMOR*.

The article describes a method used by West German tankers which enabled them to increase their effectiveness with subsequent rounds fired. This simple but effective method is to operate two tanks together as a section. One tank fires, the other tank observes. Since the firing tank crew may not be able to sense their own rounds, the observing tank commander announces his sensing to the gunner of the firing tank. This sensing tells the gunner of the firing tank where the round appears in relation to the target as viewed by the tank commander of the observing tank. By using the rule of thumb: move in the opposite direction 1/2mil when firing APDS or HEAT, and 1mil when firing HESH/HEP, the German tank crews have been able to increase their total number of hits by nearly 35 per cent over the single tank method of engagement.

The West Germans devised their simple two-tank method based upon experience they gained during the 1970 Canadian Army Trophy Matches. During the matches the tank commander, due to his inability to sense the high-velocity HEAT round, waited until the smoke and dust cleared to search the target for evidence of a hit. This resulted in a loss of time and frequently erroneous sensings of hits due to ricochets into the targets. The two-tank method relieves the firing tank crew of having to sense their own rounds, resulting in faster adjustment of fire, and a higher percentage of second and subsequent round hits.

However, because the West German tank sections are basing their adjustment of fire on a rule of thumb, more problems could be created than corrected. For example, what sensing does the observing tank commander announce when the round is lost? Does he announce a sensing of "over" requiring the gunner to drop 1/2mil? What occurs when the sensing tank commander sensed the round as being off more than 1/2mil? Does he still use the same sensings as before, thus requiring the gunner to use the rule of thumb more than once? Three or even four round engagements could result.

Students in the Armor School are instructed that due to the muzzle velocity, it is difficult to sense HEAT and SABOT. HEAT with a muzzle velocity of 3,850 feet per second is difficult to sense out to a range of 1,500 meters, while SABOT with a muzzle velocity of 4,850 feet per second is difficult to sense out to a range of 2,500 meters. However, if the gunner can sense the round, he is taught to apply the primary method of adjustment—burst on target. If he cannot apply BOT, the gunner will announce his sensing of lost or his observation of over or short. The tank commander will then take over the adjustment by issuing a subsequent fire command based upon his sensing—the alternate method of adjustment—or the special technique for HEAT and SABOT.

The Armor School recognizes the two-tank principle as a method of engagement. This method is included in FM 17-12, *Tank Gunnery*, under "Other Methods of Adjusting Fire." The major difference between the West German method and that stated in FM 17-12 is that the West Germans announce a sensing and apply a rule of thumb, while our observing tank commanders issue a subsequent fire command to the gunner of the firing tank. This subsequent fire command is based upon the relationship between the target and the impact or flight of the projectile. As the firing tank fires, the observing tank commander observes the target area using binoculars to aid in sensing the round. Based upon his sensing, both in range and deflection, he issues a subsequent fire command to the gunner of the firing tank.

This procedure is continued until the target is destroyed. The gunner of the observing tank lays on the target and senses each round fired, but remains silent unless his tank commander announces lost. Should this occur, the gunner will issue a subsequent fire command based on his sensing. If the observing gunner should sense the round as lost, then the observing tank commander would make corrections based on his judgment of the situation. Since both the gunner and the tank commander sensed the round as lost, the observing tank commander has four alternatives which are: A subsequent fire command of "Lost, Fire!"; "Lost, Cease Fire!"; "Lost, Drop 200, Fire!"; or "Lost, Drop 400, Fire!"

The observing tank commander would be basing his subsequent fire command on a special technique when firing HEAT and SABOT ammunition. Since neither the gunner nor the tank commander was able to see the round strike short as indicated by dirt or debris as the round struck, or see the tracer as the round passed the target, they assume that the round went over the target. It is based upon this assumption, that the observing tank commander could employ the special technique for a sensing of lost and issue the subsequent fire command "Lost, Drop 200, Fire!"

(continued on page 5)

Armor Center Commander's Update

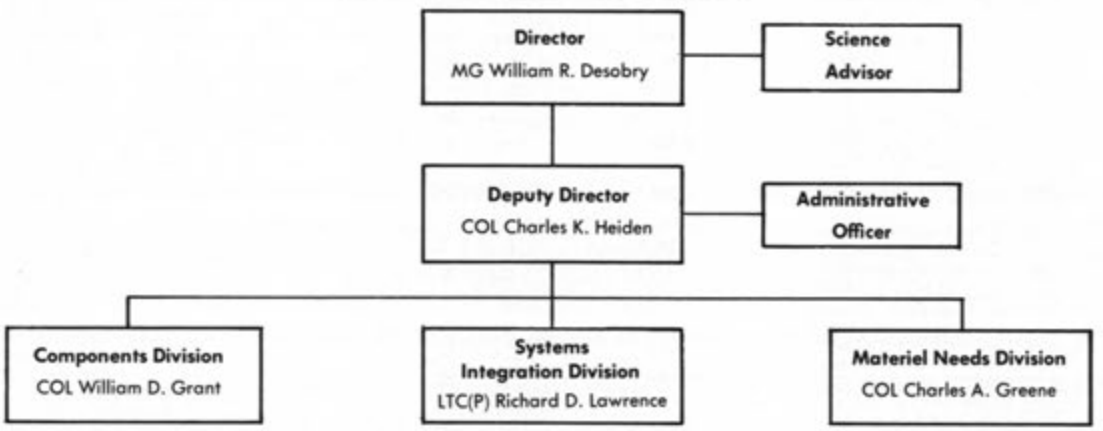

MG Wiliam R. Desobry

The Armor Center Commander's Update is designed to give you a current report of activities taking place at the Armor Center. In this Update, I will provide you with a special report on the **Main Battle Tank Task Force.**

I am sure that by now you are aware that Congress has not authorized additional funds for the *XM803* Main Battle Tank Program. Accordingly, Department of the Army has directed the establishment of a special task force to expeditiously develop and recommend a new main battle tank program which includes the following elements: (1) a statement of new main battle tank requirements to include timing, quantities and a materiel need document that defines the characteristics of a mobile weapon system derived from parametric design, cost effectiveness and qualitative analysis; and (2) requirements for continued *M60*-series tank production and improvements integrated with the development and fielding of a new main battle tank.

The Main Battle Tank Task Force was organized at Fort Knox on 16 February under the auspices of the Combat Developments Command. There are 33 personnel on the Task Force representing the Combat Developments Command and its assigned agencies, Continental Army Command, Army Materiel Command and its assigned commodity commands, and members of the Armor Center Team. We will be operational for about five months at which time our final recommendations will be forwarded to Headquarters, Combat Developments Command.

MAIN BATTLE TANK TASK FORCE



I am the director of the Task Force with Colonel Charles K. Heiden as my deputy. He is on temporary duty to the Task Force from his current position as commanding officer of the USACDC Armor Agency, Fort Knox.

The Systems Integration Division will be the quarterback of the organization with the responsibility of developing the overall tank program plan. They will also be responsible for reviewing past studies which have been conducted on design of tanks, especially those leading up to the development of the *XM803*, and the product improvement program on the *M60A1* tank. The Components Division will be responsible for cataloging the available components. This will include as assessment of their status of development and their cost, and those which should be considered for use in a new main battle tank. A Materiel Needs Division will be responsible for drafting a proposed materiel needs document which will include an analysis of the enemy threat and concept of future warfare in determining the needs for a mobile weapon system and its capabilities. The final document will tell the developing agencies those characteristics we desire to have in a new main battle tank.

In accomplishing the work of this Task Force, we must of course recognize the desires of Congress. It is my intent, however, to insure that we adhere to the basic tenents of Armor Branch and attempt to develop a realistic statement of requirements which recognizes that the firepower, the mobility, and the shock action of the tank remains as important on today's battlefield as it did when our magnificent Armor formations fought in World War II.

Not to be tied completely to the past, however, we must adapt these tenents to the future battlefield in recommending our requirements for a new tank. In addition to the capabilities of the Task Force I have described to you, we have available to us the large store of Armor expertise at Fort Knox, as well as the unqualified support from the other Army agencies who are associated with the development and fielding of tank systems. Subject to classification restrictions, I will keep you informed on this very important program.

LETTERS TO THE EDITOR

(continued from page 3)

Either of the methods discussed will increase the probability of sensing high-velocity ammunition. However, in the event of a major conflict, we will probably be at a numerical disadvantage initially, and will not be able to afford the luxury of having two tanks to engage one target. It is imperative that our doctrine require our crews to sense and adjust their own fire because that is what they will have to do in combat. Doctrine is developed for combat not for winning trophies. We can all remember examples of sound training practices being subjugated for the sake of winning first prize.

A recent rewrite of FM 17-12 provided the Armor Community worldwide, an opportunity to comment on the validity of our gunnery practices. The results clearly indicated acceptance of BOT as a means of adjusting fire. This does not mean that we can stagnate in our consideration of alternatives. What we really need is a miss indicator which will portray in the gunner's sight an image of where the round hit with respect to the plane of the target. But until the research and development people can provide us with such an indicator, or some other sight that will permit us to see the round throughout its trajectory, we in Armor must continue to train and experiment.

RICHARD M. HAIRSTON JR.
Captain, Armor
Weapons Department, Armor School
Fort Knox, Kentucky 40121

To BOT or Not To BOT

Dear Sir:

A recent letter submitted by Lieutenant Colonel John C. Bahnsen concerning BOT (Burst on Target) adjustment of fire techniques (January-February 1972) warrants this friendly counterattack from the Combined Arms Training Center (not school) here at Vilseck, West Germany.

As mentioned by Colonel Bahnsen, the initial problem of adjustment of fire stems from inaccurate ranging prior to firing the first round. It is also generally agreed that the vast majority of errors are line errors (short or over), not deflection errors. The procedure suggested by Colonel Bahnsen, however, is both theoretical and in contradiction of FM 17-12, whereas the current primary method of adjustment, BOT, is based on concrete analysis and thorough testing. The application of BOT for correcting line errors is a proven method that achieves significant results when properly employed.

The high frequency of sensing difficulties, also mentioned, is questionable. Those instances are few where the gunner's vision is so obscured as to prevent immediate application of BOT.

Colonel Bahnsen's last suggestion, that a two-tank method of adjustment be used in all Tank Crew Qualification Course tests, is not applicable to individual crew testing as outlined in FM 17-12 and currently conducted on Range 80 by CATC. In addition, if called upon to engage in tank-versus-tank conflict in the European Theater, it is doubtful that two tanks could be wasted trying to destroy one enemy tank. Time would be critical and each tank would have to rely on itself once its target was selected.

One final note: Since 1 July 1971, there have been no HEP engagements on Range 80 in excess of 1,400 meters. We agree that firing HEP at point targets at excessive ranges is difficult and involves numerous rounds to achieve a target hit.

Hopefully, the laser rangefinder will soon provide us with the answer to our problem: More accurate range determination and fewer first round misses.

DANIEL W. FRENCH
Colonel, Armor
Combined Arms Training Center
APO New York 09114

The Materiel Acquisition Process For the Bushmaster (VRFWS-Successor)

Dear Sir:

While I do not suggest a continuing exchange of letters (and assume *ARMOR* doesn't), Colonel Tuttle's letter in the January-February issue leveling adverse criticism against the Materiel Acquisition Process, using Bushmaster as an example, begs some comment.

Fielding of the Bushmaster (VRFWS-Successor) certainly has not yet been realized, and the initiation of its Validation Phase or development has occurred considerably later then originally planned. However, analysis of the change in schedule estimates cannot be attempted in isolation with any validity.

Fielding of the Bushmaster Weapon System demands the existence of at least one type of compatible platform vehicle. Even initiation of active development (beyond the Concept Formulation Phase) requires user consensus and Army agreement and decision on the vehicle, its nature, its development schedule and its fielding.

We all know that the MICV, ARSV and a new tank each have been delayed in development or before entering it. I agree with Colonel Tuttle that these programs as well as Bushmaster were delayed quite a while. It's next to impossible to develop a design and then perfect it when the requirements are shifting. If one does there is a very real risk of producing a conglomeration of mediocrity.

An alternative might be proposed; why not go ahead with the gun and retrofit it on the existing fleet in the meanwhile? This solution may well be the best in some cases, but its attractiveness must not be assumed generally or automatically. Such interim solutions often are difficult (the vehicle design already is fixed), always are costly and sometimes produce undesireable side effects. If the interim period is to be a short one, the delta cost per year skyrockets. Further, what is one to do with the old fleet when the new vehicle rolls off? Reverse retrofit? That's even more expensive.

Finally, no start can be made unless resources are available. One of the surest ways to make resources disappear is to exhibit indecision or differences over what is needed.

The Materiel Acquisition Process surely has increased in complexity during the last ten years. This results from the combined influences of technology advances, greater and more complex user requirements and

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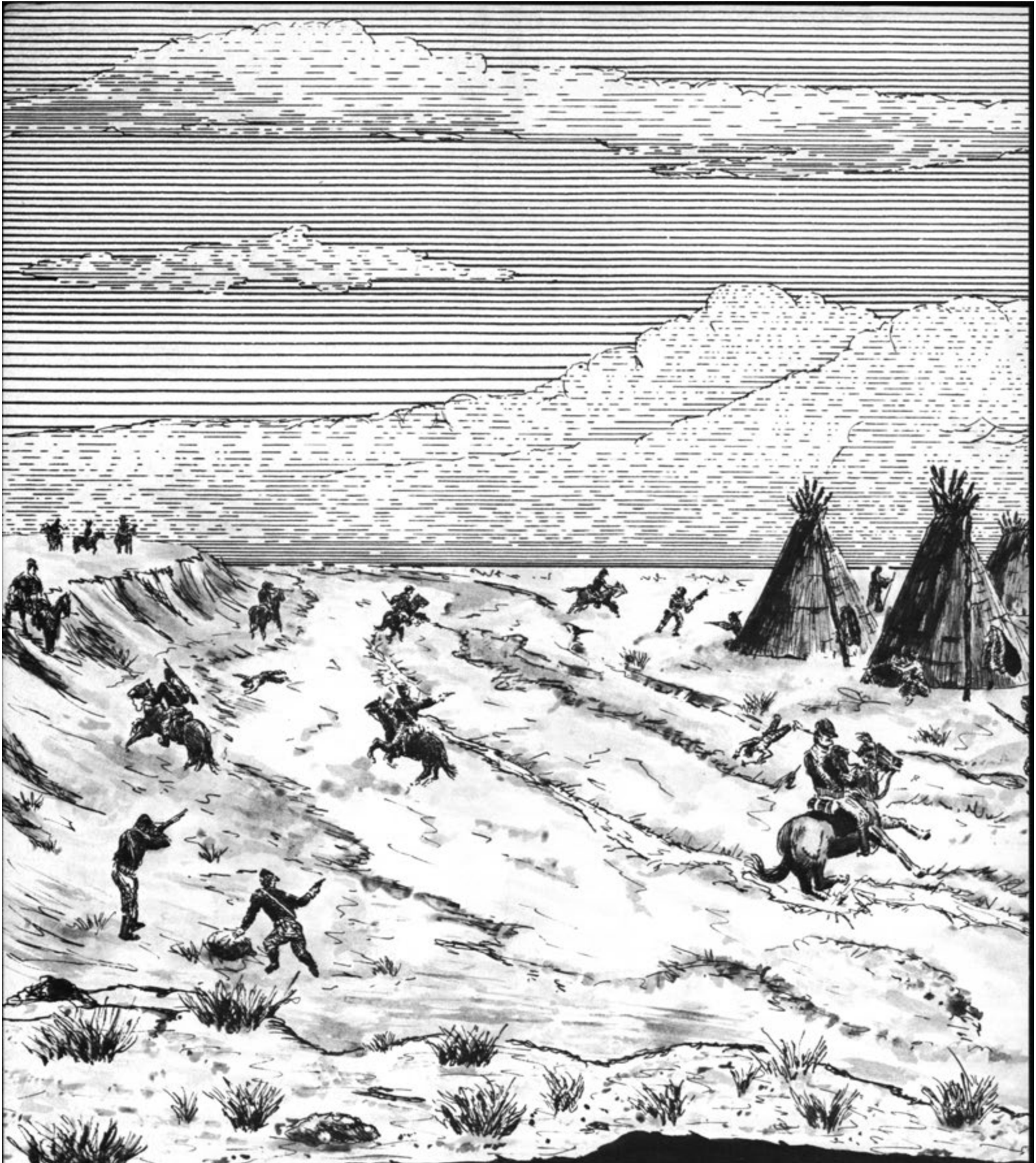


The Indian Wars represent a lively and interesting subject to consider at this point in time. The alleged atrocities in Vietnam have created an instant thirst for comparison with other defaults in our military experience. Here is the first of a three-part series on the Indian Wars, which many analysts have turned to in search for parallels and lessons.

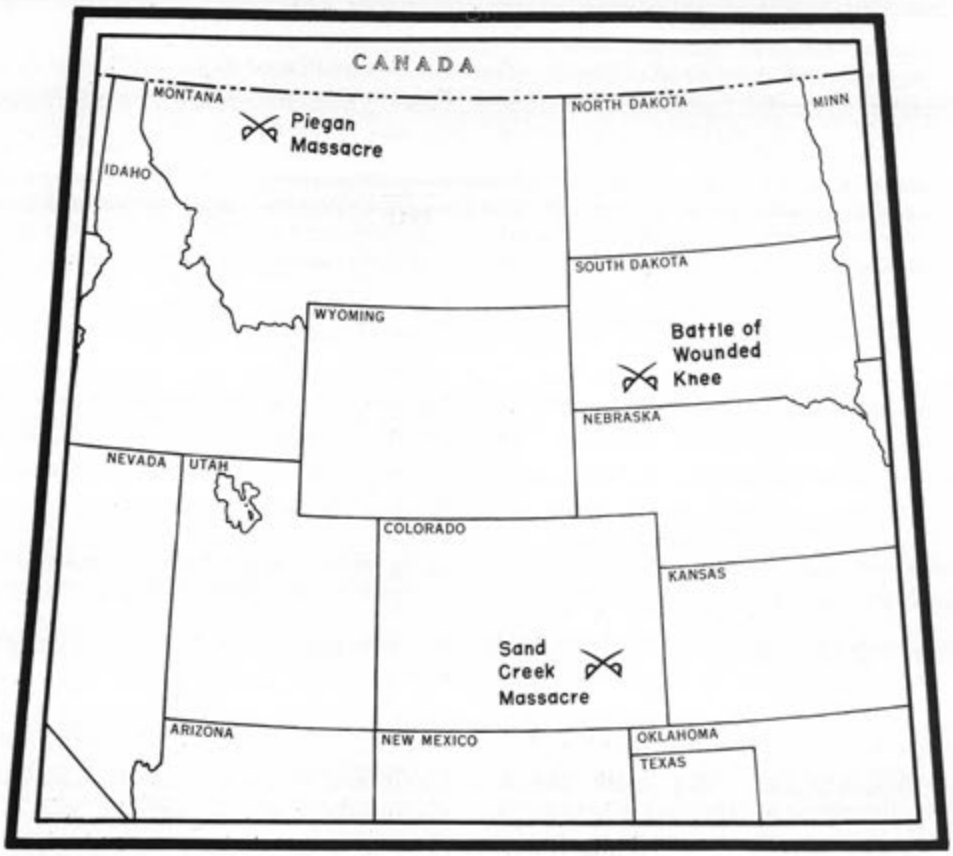
In our present period of heightened social consciousness, the pressures for equal rights and equal opportunity, sensitized especially by Black Americans, have spread to smaller minority groups. Spanish Americans and American Indians have moved increasingly to share in the rectification of injustice and the redress of grievances. Quite understandably, our "century of dishonor" is being paraded before our eyes as we go through the social, political and economic processes of setting things right.

In books, periodicals, newspapers, movies, television, the theater and any other medium you can think of—right down to and including bumper stickers—the agonizing reappraisal has been going forward. It has been cultivated by an unpopular war and fertilized by a series of unfortunate battlefield

FROM SAND CREEK TO MY LAI

Misunderstandings Surround Military Misadventures Part I

by William Gardner Bell



Three incidents of the Indian Wars period have drawn renewed attention as a result of battlefield misconduct during the Vietnam War.

behavioral lapses that, in combination, have insured that the military would come under fire for any and every actual or imagined past transgression.

The alleged atrocities in Vietnam created an instant thirst, especially in the public press, for comparisons with other defaults in our military experience. Since both the Vietnam and Indian campaigns fall in the realm of guerrilla warfare and are marked by the killing of women and children, it was natural that analysts should turn to frontier episodes in a search for parallels and lessons. Unfortunately, surface similarities inspired judgments that often ignored the facts and failed to take into account the variety of influences that qualify combat misadventures and act to nullify attempts to fit them into a common mold. Irregular aberrations defy codification, for inevitably they involve varying mixtures of fear, ambition, inexperience, provocation, justification, revenge, error, intention, bias, chance, motivation, premeditation, misunderstanding and even madness.

Ready attempts to see My Lai as a carbon copy of the Sand Creek Massacre, the Piegan Massacre, or the Battle of Wounded Knee—or conversely to see those incidents as exemplary of My Lai—only distort history and, in some cases, reflect unfairly upon various generations of soldiers as well as upon the Army as an institution. In the spate of writings provoked by My Lai, it has been interesting to see the tendency to lump these negative episodes into a common pool, represent them as the rule rather than the exception, and by statement or inference, condemn the United States throughout its history as a collection of sadists dedicated to perpetrating atrocities upon innocent human beings. Even the good, gray *New York Times* nurtured some surprising errors and insinuations in its recent review of the movie "Soldier Blue."

In time and space, the Indian Wars spanned a quarter of a century and about two-thirds of the continental United States. There were over a quarter of a million Indians in the trans-Mississippi West when the Civil War ended, divided into numerous tribes and subtribes and scattered widely over the plains, mountains and deserts of the American frontier. Some were sedentary, many nomadic, and all had adapted well to the extremes of geography and climate in their natural surroundings.

Individually the Indian was a dedicated and capable warrior; collectively he was not so effective. Indian lines of authority in and out of battle were inherently loose, and the issue in war or diplomacy was always uncertain at best. Indian social and political patterns elevated the individual over the

group, and the individual freedom practiced by the red man always puzzled the whites, who could never understand that red leaders did not truly command all of their warriors on the battlefield or speak with incontestable authority for all of their people at the council table. Thus, peaceful Indians often suffered grievously for the contradictory actions of some of their own people who refused to be bound by solemn agreements. In this there were some interesting parallels with the whites, for despite the fact that government representatives negotiated with the Indians in good faith, independent whites heeding the call of furs, gold or land often entered areas reserved to the Indian by treaty, hardening Indian resistance and inviting wider depredations that often victimized innocent whites.

The intrusion of the whites upon the Indian domain upset the rather delicate balance between the Indian and his natural environment. Routes of travel and pockets of white settlement increasingly disrupted game patterns, especially of the buffalo. The whites brought diseases that swept through vulnerable red populations, and they also brought alcohol to further demoralize the reds and heighten their dependency upon unscrupulous white traders.

The frontier Army thus had to deal with a hostile enemy on his own ground, an inhospitable terrain and insubordinate whites. Post-Civil War retrenchment killed all hope of turning sizeable military forces against the Indians, and during the entire period of the Indian Wars, the Army operated at peacetime strength and on a peacetime budget. Authorized strength dropped sharply after the Civil War, from about 57,000 in 1868 to around 27,000 after 1876; certainly not an imposing force, given its national responsibilities, the size of the theater of war, losses to effective strength, and the potential represented by the enemy. The Army's great advantage over the Indian lay in its discipline and organization.

Three episodes of the Indian Wars have had renewed attention in recent times and have acquired a new pertinence because of events in Vietnam. All have been marked by misunderstanding and misinterpretation, along with a surprising amount of misinformation. In combination, they offer an interesting diversity of date, location and adversary. The Sand Creek Massacre, for example, occurred in Colorado Territory in 1864 and involved Colorado Volunteer Cavalry and Cheyenne Indians. The Piegan Massacre took place far to the north in Montana Territory in 1870 and involved the Regular Army's 2d Cavalry Regiment and Piegan Indians. And the Battle of Wounded Knee occurred in South Dakota in 1890 between the Regular Army's 7th Cavalry Regiment and Sioux Indians.

THE SAND CREEK MASSACRE

The Sand Creek Massacre is properly named. It occurred on 29 November 1864 in southeastern Colorado Territory. The Civil War was in full swing, Regular Army units had been withdrawn from the frontier long before, and defense responsibilities in the West were in the hands of volunteer units.

The north/south area between the Platte and Arkansas Rivers, and extending from central Kansas out to the Rocky Mountains, had been recognized in the Fort Laramie Treaty of 1851 as the domain of the Southern Cheyenne and Arapaho Indians. The arrangement had lasted only seven years when gold was discovered in the South Platte and Pike's Peak regions of Colorado along the eastern slopes of the Rockies. The stampede that followed rivalled the California gold rush of a decade before, and the expanded intrusion upon Cheyenne-Arapaho territory widened red and white confrontation and created pressures to renegotiate the 1851 agreement.

The Treaty of Fort Wise in 1861 reduced the Indians to a reservation on the upper Arkansas River. They were to give up their wild life and be taught to farm—not a very inviting prospect in the gameless and generally arid section of southeastern Colorado set aside for them. The Indian signatories —Chiefs Black Kettle and White Antelope of the Cheyennes and Little Raven of the Arapahoes—did not represent all of their tribal bands, and indeed were condemned by others of their people for giving up both territory and a way of life. Non-treaty bands continued to roam the Platte-Arkansas region, and when the treaty Indians became aware that Colorado's Governor John Evans wanted to clear them from areas desired by white farmers and miners, and didn't really have their interests at heart, they refused to assemble within the reserve. Several incidents in 1863 provoked resentments and there was increasing talk of war. Governor Evans held to his plans for clearing the reds from settled areas, an interest shared by his local military commander, Colonel John M. Chivington.

John Minton Chivington was born in Ohio in 1821. At the age of 23, he took up the ministry and preached in his home state and in Illinois, Missouri, Kansas and Nebraska. He finally settled at Denver in 1860 as presiding elder of the First Methodist Episcopal Church, organized the first Methodist

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Colonel John M. Chivington, Methodist minister turned soldier, was the perpetrator of the Sand Creek Massacre that occurred in Colorado Territory in November, 1864.

Sunday School in Denver, and preached at mining towns in the area.

As the Civil War spread to the West, Chivington was tendered a commission as chaplain of Colorado's First Regiment of Volunteers. This he refused, asking for a "fighting" rather than a "praying" commission. When Confederate forces in Texas moved up the Rio Grande Valley to take Albuquerque and Santa Fe, Colorado Volunteers joined New Mexico Union forces to meet the rebels at Apache Canyon and Glorieta Pass. In the latter action, Chivington commanded a flanking element that captured and destroyed the enemy's supply train, forcing a retreat to Texas.

When the Colorado forces returned to Denver, Chivington assumed command of the newly created District of Colorado, a post that provided him with an ideal platform from which to launch himself into Colorado politics. Seriously deficient in qualities normally associated with one of his calling, he found the loose frontier environment especially to his liking. One officer described Chivington as "a crazy preacher who thinks he is Napoleon Bonaparte."

Chivington was relatively free of official restraint. From 1862 to 1864, the Central Plains area was a part of the Department of the Missouri, whose successive commanders, Major Generals Samuel R. Curtis and John M. Schofield, were too busy fighting rebels in Arkansas and Missouri to bother with remote and minor Indian problems to the west. An organizational change in January of 1864 established the Department of Kansas under General Curtis with four districts. Those of North and South Kansas were involved principally in operations against Confederate forces. The two districts more distant from the departmental headquarters at Fort Leavenworth—those of Nebraska and Colorado—were wholly concerned with Indians, about whom Curtis knew very little. In every sense, then, Chivington was well removed from superior authority.

The Cheyenne War of 1864 seems to have developed out of a general belief on the part of both reds and whites that the other intended war. There was plenty of provocation on both sides. Fighting between the Cheyennes and the Utes produced some side effects involving the whites. Raiding for plunder was a part of the Indian way of life, and when this custom was fortified by a threat of starvation, the red man had to take his food where he could find it. When stock disappeared from farms and ranches in his district, Colonel Chivington put several punitive expeditions into the field. The troops were rarely able and perhaps not particularly inclined to distinguish between one tribe and another or friendly bands from hostile. The military operations provoked retaliation that fell upon whites living in and passing through the region.

The murder of a family named Hungate near Denver spread panic over the Colorado settlements. It heightened white fears of a repetition of the Great Sioux Uprising in which over 700 whites had been killed in Minnesota only two years before. That incident had left a climate of fear throughout the West, and the whites in Colorado were also particularly sensitive to the possibility that the various Plains tribes might join forces to attack them.

During the summer and into the fall of 1864, the departmental commander, General Curtis, and Major General James Blunt of the newly created District of Upper Arkansas, led expeditions through Kansas and Nebraska to search for the ever-elusive Indians, but with little result. Their operations were cut short by Confederate raids into Missouri, which diverted their attention and left Colonel Chivington in Denver with a high degree of control over military affairs in the Central Plains.

As fall approached, the Indians turned their thoughts away from war. Winter was ahead and an autumn buffalo hunt was essential to winter subsistence. In this atmosphere some of the more peacefully inclined chiefs regained their influence. Back in June, Governor Evans had published a proclamation inviting friendly Indians to camp near military installations to avoid confrontation with troops in the field. Seeing this as a friendly gesture, Chief Black Kettle made overtures to the commanding officer at Fort Lyon, who took the Cheyenne leader and a delegation to Denver to negotiate with territorial officials.

Their arrival in Denver placed Governor Evans in an awkward position. Indian activities through the summer had overtaken his peace program. As fear gripped the whites and the flow of supplies from the east was seriously impaired by Indian depredations,

the Governor had adopted a warlike posture, publishing another proclamation in which he called upon the whites to kill and take the property of "all hostile Indians of the Plains." He had requested and had been granted authority to raise a 100-day regiment of volunteers, designated the 3d Colorado Cavalry, and Chivington was whipping it into shape for field duty.

As one historian describes Governor Evans' dilemma, "To make peace now would antagonize the vociferous segment of the population that cried for revenge, allow the 3rd Regiment's enlistment to expire before it saw action, cast doubt in Washington on the governor's assessment of the Indian danger, leave unresolved the question of Indian title to Colorado lands, free the Indians from retribution just when they were most vulnerable and when Chivington was best prepared to exact it, and embolden the tribes to try the same thing the next season."

Governor Evans evaded responsibility by dumping the problem in the military commander's lap, and Chivington reluctantly gave the Indian leaders permission to report to Fort Lyon with their people when they were prepared to "lay down their arms and submit to military authority." This, of course, was exactly what they were proposing to do, but Chivington held clear of specifics and left as much ambiguity in his position as possible. In October, Major Edward W. Wynkoop received Chiefs Little Raven and Left Hand with 113 lodges of Arapahoes at Fort Lyon and issued them rations, as they were to be disarmed and immobilized, and would thus be unable to hunt.

When word of this reached departmental headquarters back in eastern Kansas, the arrangement collided with General Curtis' determination that the Indians should "suffer more" before peace was concluded. Wynkoop was promptly replaced at Fort Lyon by Major Scott J. Anthony.

Following understandings already reached, Anthony disarmed the Arapahoes and located them at the mouth of Sand Creek, a small tributary of the Arkansas. When Chief Black Kettle came in to report that his Cheyenne band was camped on the upper reaches of Sand Creek, Anthony told them to stay there until he could secure permission to feed Indians at Fort Lyon.

Meanwhile, the 100-day enlistment of the 3d Colorado Cavalry—dubbed the "Hundred Dazers" and the "Bloodless Third"—was rapidly running out and the unit had yet to see action. Although the unit had been recruited from among the undesirable elements of the territorial population, Chivington's subordinates had organized, equipped and mounted it. Chivington, prompted by the governor's and the departmental commander's animus toward the Indians and abetted by his military independence and personal ambition, now set in motion a chain of events that would end in disaster for some peacefully inclined Cheyennes.

OKLAHOMA HISTORICAL SOCIETY

Chief Black Kettle, whose Cheyenne band was attacked by the Colorado Volunteers on the upper reaches of Sand Creek.

It is interesting to note that statehood for Colorado was voted upon and defeated in early November of 1864 in an election in which Chivington was badly beaten for the office of territorial delegate to Congress. Offsetting this was his victory over the same opponent in a contest for Congressman on the statehood ticket. Although the triumph was an empty one when statehood failed, the challenges and prospects raised by both results were sufficient to tempt far less ambitious men than Chivington, and the thought of what a battlefield "victory" might do for his standing in territorial politics undoubtedly influenced his every move.

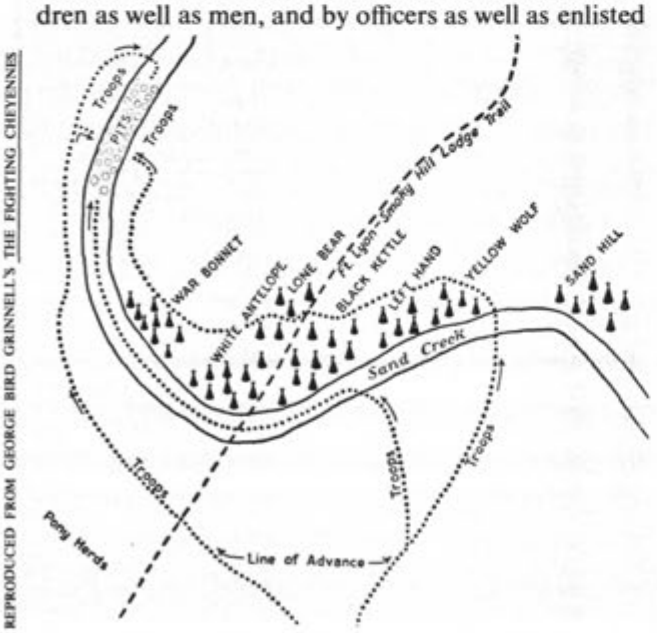
On 14 November, Chivington issued marching orders. The 3d Colorado Cavalry and three companies of the 1st Colorado departed Camp Weld outside Denver. Other companies from scattered locations joined the force at Camp Fillmore on the Arkansas, and at noon on 28 November, the column rode into Fort Lyon completely unannounced. Chivington immediately posted guards, as he had at ranches along the way, to prevent word of his presence in the area from reaching the Indians.

When they learned that their commander intended to attack Black Kettle's Cheyenne village on Sand Creek, several officers made strong representations to Chivington. Reminded of the pledges of both Wynkoop and Anthony, Chivington stated that he believed it to be "right and honorable to use any means under God's heaven to kill Indians that would kill women and children." He also gave it as his firm opinion that officers who defended the Indians "had better get out of the United States service."

Attempts by several other officers that evening failed to dissuade him from his fixed purpose to attack the Cheyenne village.

At eight o'clock on the evening of the 28th, Chivington's force marched out of Fort Lyon for the Indian camp on Sand Creek, some 40 miles to the north. At his back rode 450 men of the 3d Colorado Cavalry and about 250 of the 1st Colorado. The 700-odd men were organized into five battalions, and the command also had an artillery battery of four mountain howitzers.

As the sun rose on 29 November, Chivington's command reached a low ridge overlooking the Sand Creek bottoms where the Indian village lay. He sent his troops in on both sides of the village, separating the main pony herd in the process. Black Kettle watched the deployment with apprehension. He hoisted an American flag and a white flag over his tepee and tried to reassure his people. Chief White Antelope meanwhile moved toward the soldiers, pleading with them not to fire. But the troops opened fire and White Antelope fell. The Indians scattered in all directions, seeking to escape death by fleeing. Many were overtaken and killed. A small group dug in behind an embankment and stood off their attackers for several hours before all were killed. While the men of the 3d Regiment—the "outpourings of Denver saloons"—plunged gleefully into the slaughter, those of the 1st, of higher motive and longer service, for the most part held themselves in check. All manner of atrocities were committed by Chivington's force that day, upon women and children as well as men, and by officers as well as enlisted



REPRODUCED FROM GEORGE BIRD GRINNELL'S THE FIGHTING CHEYENNES

Map showing the disposition of the Cheyenne Indian village on Sand Creek and the lines of employment of the Colorado Volunteer Cavalry troops.

The Sand Creek Massacre site is peaceful today. Sheep graze along the creek where the Indian village lay under the bluff.

soldiers. Somehow, Black Kettle and others of his band escaped. But upwards of 200 Indians, perhaps as high as two-thirds of them women and children, were killed at Sand Creek. Chivington lost—9 killed and 38 wounded. As he characterized the day's work in a message to the department commander, "All did nobly."

Several officers felt otherwise, and as word of what really happened at Sand Creek spread, the reaction grew. Eventually, one military and two Congressional investigations were conducted and the body of evidence developed out of extensive testimony condemned both the man and his act. Unfortunately, Chivington and the "Bloody Thirdsters" were mustered out of service before retribution by military proceedings could catch up with them.

In the larger view, it is clear that Governor Evans, General Curtis, and the people of Colorado, as well as Indian provocation and wartime circumstances, all had a hand in creating the conditions that made something like Sand Creek possible. It all came into focus in the person of John M. Chivington.

Quite often today, we see a tendency on the part of analysts working from a base of social change to condemn the entire American public of other times for acts of barbarism and injustice. They give the impression that their judgments are new-found and unique, when in fact they are neither. There is certainly no more justification for condemning 1864 Americans for the sins of John Chivington than there is for condemning our present generation for the actions of Lieutenant Calley. And in any case, we have not had to wait until now for our judgments on John Chivington. The Joint Congressional Committee on the Conduct of the (Civil) War spoke for the majority of Americans at the time when they said of Chivington: "He deliberately planned and executed a foul and dastardly massacre which would have disgraced the veriest savage among those who were the victims of his cruelty."

In the next issue of ARMOR, *"The Piegan Massacre."*

What happens now that the *XM803* program has been terminated? It is time to re-evaluate Armor's main battle tank program.

to build a tanker's tank

by
major ralph a. barkman
captain teddy h. sanford jr.

ARMOR Magazine was recently blessed with the cause for innumerable future articles when Congressional action caused the termination of the *XM803* last December. Articles and letters to the editor each month, however, will have little effect upon the new tank program currently underway, Responsibility for the new program rests with a Task Force located at Fort Knox under the chairmanship of Major General William R. Desobry, Commanding General of the Armor Center and Fort Knox, working close in hand with the CDC Armor Agency and the other elements of the Armor Center Team. All interested parties within the Army family have been tasked to support the Task Force. In short, talent is at hand to accommodate the task.

But while this is true, the readers of *ARMOR* have a vested interest in what the next tank will be. We submit that in order to produce a tanker's tank, your views should be considered during the preliminary stages of development.

Before 10,000 fertile minds conceive 10,000 new vehicles ranging from a dune buggy to a tracked

Cheyenne, let the problem be placed in perspective. Congressionally imposed time restraints will require a new tank in a relatively short period of time and at an acceptable unit cost. We should set our sights on a tank-like vehicle which provides an improvement over present systems. Our collective task is to retain and improve the best of the old while incorporating the most productive of the new.

In order to accomplish this task, new approaches are being examined to insure that the requirement is properly and completely stated and that the design incorporates those necessary capabilities to meet the requirement.

ENVIRONMENTAL APPROACH

There were those both in and out of the Armor community who were pleased by recent Congressional actions to terminate the *XM803* Main Battle Tank Program. Some felt that the degee of sophistication and cost were just more than could be properly justified, but others were pleased because it supported their thesis that the tank is "as anachronistic as medieval body armor." There was even a minority faction who believed in the *XM803* and felt that it could properly fill the MBT requirement for the 1980s.

Unfortunately, the reasons that so many varied options are heard is a general lack of meaningful information on current and advanced technology; a misinterpretation of what projected threats really mean; and a minimum of understanding as to the complementary nature of the various weapons systems now present in the inventory or programmed for input in the future. What we have said, in the admittedly long preceding sentence, is that we do not understand the environment.

In the current effort to develop a new main battle tank, a new approach to determine the requirement for the tank is being attempted. Instead of simply looking at a set of organization tables of Soviet tank and motorized rifle battalions, along with a set of characteristics for a tank that they may produce in unknown quantities on unknown dates, the entire environmental picture is to be examined. This examination will include an assessment of the national policy of the United States and its allies, threat, weather, topography, demography, and considerations such as budgetary constraints, national priorities and production feasibility. All of these factors must be examined and fully understood in order for the requirements documentation to be prepared and to insure that the design characteristics are reflective of the requirement.

At this writing, the task of defining the environment is being pursued; however, some preliminary observations must be made. For the foreseeable future—the next fifteen to twenty years—United States policy will focus on the defense and stability of Western Europe. While the Nixon Doctrine will decrease the probability of major US armed forces involvement in conflicts elsewhere, the commitment to Western Europe will take on increased emphasis. Therefore, the major threat will be posed by the armed forces of the Soviet Union.

The most striking element in an examination of Soviet forces is the massive numbers of tanks and mechanized vehicles in their inventory. While the quality of their equipment may change, no dramatic shift in their current force structure is anticipated. It is therefore necessary that the US Army be prepared to fight on the European battlefield against massed armored formations.

Now, to prepare to fight against this threat, we have tended to examine the opposing forces in Europe in the numbers presently on the ground. When this is done, it becomes apparent that the US sector, with less than five divisions, may have a problem defeating several field armies. Assuming that these are the forces that will fight, we begin at once to think defensively. In the defense, the tank is an adjunct to *TOWs, Dragons* and attack helicopters as an antitank means. The question is what happens when we go to the offense. Is an *M113* with a *TOW* stuck on the top going to assault? Perhaps in the offense, a tank still might have some use. Those who would dispute this are often the same people who have forgotten that offense is a principle of war.

For a long time now, we have been taught that the tank alone cannot survive on the battlefield. In the offense, cross-attachment with mechanized infantry forms the most potent formation, the tank-infantry team. We submit that this is often true, but should not be sanctified. Until recently, Infantry units did not possess the firepower to defeat armored formations, and so tank cross-attachment was necessary to give them the required tank killing capability. This resulted in the tank being relegated to the role of an antitank gun and the fragmentation of our limited tank assets. The introduction of the *TOW* and *Dragon* antitank systems have vastly improved the Infantry's ability to hold its own. It also gives us the opportunity to change our thinking on the tank's role and character. If we consider that the tank is an attack system, we should begin by removing it from along the FEBA. Tank assets of a division should be massed to the rear where, along with air attack elements, the division commander will have a

numerically significant strike force for employment at the decisive moment of the battle.

The concept stated here is not new and does not reflect any approved position of the Armor community. It is intended to demonstrate a possible course of action based on an evaluation of the environment. Development of the environment and formulation of the battlefield doctrine are primary steps. From them, the developer of a tank or any other system can then answer the questions:

- Do we need the system?
- What will it be used for?
- What systems complement its capabilities?
- What must it defeat?
- Who will have to use it?

The answers to these questions are necessary to insure that the design characteristics of the system provide us with what we want and what we need, when we need it.

DESIGN APPROACH

Design approach for US Army tanks has always been shaped by an equation among firepower, protection and mobility as constrained by pre-established physical characteristics. Human engineering requirements have provided generous internal space, hence large exterior dimensions. Desires for increased firepower and adequate protection levels have resulted in relatively heavy vehicles with attendant degradation on mobility. The sought after advances in firepower have been accompanied by ever increasing sophistication.

By following the same rationale we have adhered to in the past, the new tank would then be a super *M60A1*. How super would be dependent on fund limits more than anything else. We believe that an evolutionary tank must be developed; that it can be an overall improvement above what we will achieve with the product improved *M60A1*; and that this is feasible at modest cost. Reflecting once more on past experiences, what has just been said is not a new utterance. The original requirements document for the *XM803* painted the picture of a tank quite different from the hardware which was eventually constructed. For the *XM803*, flexibility and conflicting desires created the tableware which allowed a very heavy, sophisticated, expensive and unreliable animal to consume itself. To preclude a like disaster in a new tank, development must be controlled by a defined technological cutoff and sound guiding principles with an aim of establishing attainable general characteristics in accord with battlefield needs.

Military technology is increasing at a startling rate. Were a new tank to use only proven, in-being components, the result would be an improved *M60A1* or *M60A2* without the benefit of superior technological advances achievable in the near future. Everyone would undoubtedly agree near future ought to be incorporated where applicable. Problem—define near future. Is it two years from now or ten? The point is that a technology cutoff date must be determined and then locked in. Failure to do so allows for a continuously changing vehicle development program that retains the consistency of Jello.

As we think in terms of technology, advancements and improved combat effectiveness, it is well to keep one's feet firmly planted on earth. Some basic principles of realism are sufficient to do so. Consider for openers the principles of reliability, redundancy, simplicity and cost. Regardless of how effective a tank may be when placed into battle, if it fails to function, it becomes nothing more than so much clutter. The reliability of its component parts with the weakest link determine the result. Redundancy has long been a principle of tank design in the fire control system. Within cost and weight constraints, the desirability of these and other backups must be examined. Perhaps reliability can be improved more readily using backup systems than in attempting to design fail safe components.

Another major principle is simplicity, limited here to that degree of difficulty facing the individual soldier in fighting and maintaining his equipment. So long as reliability criteria are met, the amount of technological sophistication behind the advance does not matter so long as the tanker can accomplish his task with a minimum of training and manual manipulation. Component repair is desirable by replacement at the lowest maintenance level using common tools. Our last basic principle should be crystal clear after the *XM803* experience—dollars. The new tank should have a production cost which will be reasonable, let's say below $500,000. This figure is between the *M60A1* and *M60A2*, and a far sight less than the *XM803*. This should allow us to build a good tank and force the rejection of high sophistication type componentry.

Means are now at hand to provide more reliable and powerful engines for tank use. Tube over bar suspension will provide for faster cross-terrain speeds. The key is not top speed but rather acceleration and agility. Weight reduction, in hand with power increase, will suffice to cause an appreciable increase in mobility. Deep water fording difficulties have not been solved and an answer is not around the corner.

Much cost and most sophistication in modern tanks is found in the firepower area. How much more do we need? Common sense and terrain studies indicate that most battles will be fought at short to mid ranges. The gun system can adequately fight in this range spectrum. Increases in accuracy and lethality can be accomplished at moderate expense so long as we do not attempt to build a system that kills everything at all ranges. Tools are at hand or in the offing to attrite at long ranges; let the tank return to its primary destruction missions—enemy troops and equipment, enemy tanks incidential to accomplishing the mission. Complementary (secondary weapons) tank armament requirements remain the same but something better than the .50-caliber machine gun ought to be available as an antiair weapon.

We must protect against the effects of nuclear weapons, antitank systems and mines. So stated and you say we're back in the 50-ton tank class. Not so! The key to protection is not inches of steel but reduced vulnerability. Advances in weaponry cause such things as reduced size, greater mobility, and damage limiting design to count more in survival than sheer thickness of armor. Reduced silhouettes and greater mobility make the target more difficult to hit. Ballistic protection equal to current tanks can be attained for less weight using new materials and array concepts. Vehicle design which takes care in crew compartment isolation, fuel storage arrangements, ammo rack design, and limits spallation effects will result in tanks which can continue to fight even if penetrated.

This necessarily broad treatment has not addressed several ancillary design factors such as deployability, logistical support or integration. Specific answers have not been provided to critical priority and trade-off questions. Technology, now and near future, holds the key to what is achievable and at what cost. By using the expressed basic principles and tank design approach we can use technology instead of being used by it.

IN SUMMARY

As these two approaches indicate, there is much more involved in the development of a weapons system than might at first be expected. However, they also show that a great many decisions are based on subjective factors. This is not necessarily bad because there is great value in broad based experience and military judgment.

Each member of the Armor community can contribute to this effort, and your thoughts are solicited. Letters may be addressed to the authors, USACDC Armor Agency (Studies), Fort Knox, Kentucky 40121.

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CAPTAIN TEDDY H. SANFORD JR. was commissioned in Armor from the University of Hawaii in 1964. His troop assignments include duty with the 2d Armored and 1st Air Cavalry Divisions. A graduate of the Armor Officer Advanced Course, Captain Sanford is now serving as a project officer at the US Army Combat Developments Command, Armor Agency.

UNITED STATES ARMOR ASSOCIATION
PROGRAM OF AWARDS

Article III of the Constitution of the United States Armor Association states that "the aims and purposes of this Association are to disseminate knowledge of the military arts and sciences, with special attention to mobility in ground warfare; to promote the professional improvement of its members; and to preserve and foster the spirit, the traditions and the solidarity of Armor in the Army of the United States."

A very real aspect of this is the recognition of individual achievement among the members of the Branch. Also, it is the desire of the officers and Executive Council of the Association to recognize the continuing support of our members and subscribers. Therefore, within the constraints of financial and administrative feasibility, the Executive Council at the time of its January 1972 meeting enacted the following program of awards.

OFFICER AWARDS

This portion of the awards program is designed to single out for recognition the accomplishments of the junior officers of Armor Branch. While the achievements of the more senior officers can and should be recognized, it is important that the Association aid in instilling in our junior officers that sense of solidarity which through the years has forged a basic bond within the Armor team. To this end, the following awards shall be continued or newly implemented as is appropriate.

- The awarding annually of an engraved presentation saber to each of the two outstanding graduates of the US Army ROTC who receive a Regular Army commission in Armor.
- The awarding annually of an engraved presentation saber to each of the two outstanding graduates of the United States Military Academy commissioned in Armor.
- The awarding annually of an engraved presentation saber to each of the two outstanding graduates of the Active Army OCS being commissioned in Armor.
- The awarding annually of an engraved presentation saber to each of the two outstanding graduates of the Army National Guard OCS being commissioned in Armor.
- The awarding of an engraved sterling Revere bowl to the outstanding graduate of the Armor Officer Advanced Course. Also, the awarding of a gratis, one-year membership or the extension of a current membership, whichever is appropriate.

NCO AWARDS

In order to recognize the achievements of the noncommissioned officers, the Executive Council has set for itself a deadline of its May meeting for the consideration of a suitable program of awards. In this way, the Association is seeking to insure inclusion in its programs all components of the Armor Team.

UNIT AWARDS

As stated, the Association is desirous of recognizing the continued support of its individual members and unit subscribers to its journal. While it is firmly held that the strength of the Association lies in the participation of its membership, so also is it felt tnat such support is a necessary adjunct to the professional responsibilities of the members of our Branch. For its part, the Association is committed to the continued expansion of the quality of its journal, *ARMOR*, thereby seeking to fulfill its responsibilities to the membership. For purposes of this awards program, the Executive Council has elected to emphasize the necessity of making *ARMOR* available in all dayrooms and orderly rooms.

The following outlines the Association's program for the recognition of units achieving 100 per cent participation by unit funds subscribing to *ARMOR*. To so qualify, every unit fund must have a minimum of *two* subscriptions.

BATTALION-SIZE UNITS

Type of Award: Walnut plaque and certificate

Administration: The Secretary-Treasurer of the Association shall have authority to approve awards to battalion-size units so qualifying and shall be responsible for the administration of them.

Criteria and Application Procedures:

- A battalion-size unit is defined as any Active Army or Reserve Component Armor, Cavalry or Air Cavalry battalion or squadron. Also eligible for this award are any battalions of other Arms or Services organic or attached to a major Armor unit.
- To be eligible for an award, all company troop size units within the battalion authorized a unit fund must have a minimum of *two* unit fund subscriptions to *ARMOR* Magazine.
- It is the responsibility of the battalion commander to submit a request for the award to the Secretary-Treasurer.
- A battalion-size unit shall be eligible to receive an award once each calendar year irrespective of the time during which it so qualified.

MAJOR UNITS

Type of Award: Walnut plaque and certificate

Administration: The Executive Council of the Association shall approve all major unit awards for the preceding calendar year at the time of its January meeting. The Secretary-Treasurer shall be responsible for providing the Council with the data substantiating that each major unit eligible for the award has met the necessary criteria and has followed the prescribed procedures in applying for the award.

Criteria and Application Procedures:

- A major unit is defined as any Active Army or National Guard unit that is a division-size organization, Cavalry regiment, or a separate brigade.
- It is the responsibility of the major unit to provide the Secretary-Treasurer of the Association the data substantiating its eligibility by 15 December of the calendar year for which it is applying for the award. This lead time is necessary to enable the Secretary-Treasurer to verify the data and to present it to the Executive Council at its January meeting.
- To be eligible for an award, all company-size units within the major unit authorized a unit fund must have a minimum of *two* unit fund subscriptions to *ARMOR* Magazine.

Presentation: All awards to major units shall be presented to the commanding officer or his representative at the Association's Annual Meeting held during the spring of the year during which the award is approved.

A detailed resume of the awards program shall be sent to the commanders of all battalion and major units reiterating the composition of the program and outlining the necessary application procedures.

CO$T-EFFECTIVENE$$

A New Look at an Old Problem

by Mrs. Brenda W. Atkinson

During the past three years, the management tools and concepts utilized by the Department of Defense in managing the weapon systems programs have undergone evolutionary change. These changes have taken place against a backdrop of much rhetoric which has created a lot of heat, and after three years, some light.

Secretary of Defense Melvin Laird and Deputy Secretary of Defense David Packard have been the driving force in this evolutionary process. Secretary Laird, with his broad background of 16 years in Congress, brought to this task a viewpoint which was integrated with Deputy Secretary Packard's experience as president of Hewlett-Packard Electronics Company, a multi-million dollar firm which has been dealing with the Department of Defense procurement policies since World War II. Between the two of them, they have streamlined the management and reporting structure, and by selective decentralization given Service program managers greater responsibility and authority for their particular system. They have brought the concept of competitive development and "fly before you buy" into sharp focus. Recognizing the merits of these management concepts, the Services have made significant strides in developing prototyping programs and operational test and evaluation.

To assist in the implementation of the Laird-Packard approach for improved management of the development and procurement of major weapon systems, the Defense Systems Acquisition Review Council (DSARC) was established in May 1969. It is composed of four top-ranking members of Secretary Laird's staff—the Director of Defense Research and Engineering and three key Assistant Secretaries of Defense (Installations and Logistics, Comptroller, and Systems Analysis)—plus the Secretary and principals from the Services.

This council monitors and determines the fate of weapon systems at key milestones of the development and procurement cycles. Considered are the development progress to date, prospects for future development success, costs, and the role in the overall defense effort. A parametric cost estimate is required. This is based on quantified relationships between the cost and physical performance characteristics of past systems. It takes into account the setbacks and uncertainties that occurred during the development and acquisition of major weapon systems, thereby affording a more realistic projection of new equipment costs. It aids in preventing low cost estimates which inevitably result in overruns, but requires the existence of a well-developed data base.

In order to control cost trade-offs, the Office of the Secretary of Defense (OSD) established financial management controls—a system of fiscal guidelines. The Services must operate within their dollar ceilings as established by the defense budget and its projections. If an individual weapon system is in excess of a Service's fiscal ceiling, it must compensate with reductions in other funding areas. This requires the Services to maintain awareness of the total funding impact of their systems and to insure better cost estimating of the life cycle cost of a new weapon. It is recognized that a cost estimate will suffer some change due to the many unknowns in developing a new system.

To provide standardized, management-oriented data for DOD decisions on weapons acquisition, the Selected Acquisition Information and Management System (SAIMS) was established. SAIMS consists of subsystems divided into categories of economic support and performance measurement. These include: the Cost Information Reports (CIR) which provides historical cost information required for parametric cost estimates; the Economic Information System (EIS) to state the economic impact of defense by geographical area and industry; the Procurement Information Report (PIR) containing detailed cost information in support of the pricing and negotiation process; the Contract Funds Status Report (CFSR) to develop, update and forecast fund requirements and budget estimates; the Cost Performance Report (CPR) a summary of cost and schedule status infor-

How would you like to spend nine years, over $300 million and come up with a big zero . . . and then face Congress and the American public?

mation; and the Selected Acquisition Report (SAR) a quarterly summary of the entire history of the system. All are designed to keep DOD informed on programs, to assure better management control, and to hopefully avoid unforeseen problems and the necessity for last-minute action in the acquisition of a weapons system.

What the above policies are designed to assure is an efficient and thorough evaluation of the contribution a proposed weapon system will make to our defense capability and to analyze whether that capability is worth the cost. Since the United States has elected to possess smaller quantities of more highly capable equipment, in contrast to the Soviet Union's reliance on large quantities of individually less sophisticated items, it is essential that we get the best quality for our defense dollars. Therefore, in assessing the utility or cost-effectiveness of various candidate items of military hardware, it is necessary to view acquisition in terms of total military objective, while becoming increasingly selective in our procurement policies. Thus trade-offs within a weapon's family, and among other families of equipment are conducted, and this hinges on cost-effectiveness.

Against this background of policies and institutional apparatus established by OSD and the Services for the management of weapon systems acquisition, let us examine the concept of cost effectiveness and its capability to make the system work in today's climate of tight defense spending.

Due to the competition for financial resources and imposed budget ceilings, the Services must determine what new weapons they need and at what cost. To determine this, cost-effectiveness studies are conducted to assist in the overall management of a weapon system and, in particular, to give the decision-makers backing. To illustrate this point, let's concentrate on the *XM803* as an example.

Upon conception of a new weapon system, the Army prepares a materiel need (MN) document establishing bands of performance which will facilitate trade-offs between characteristics, funding and technical limitations. From this concept formulation phase, the weapon will pass through the many milestones in its life cycle. Its process is monitored not only by the Army but by the DOD management system that was previously described.

Early in the cycle, in order to determine necessity and worth, a cost-effectiveness study is normally conducted. The system will be analyzed as to its anticipated effectiveness and associated costs against other weapons in its family to determine if it is worthwhile, what systems it will replace, and what combination of systems would be the most advantageous alternative. The concept of a cost-effectiveness study is to determine what system or mix of systems provides the greatest military capability for the least cost. This is a noble aim, but one seldom achieved. You cannot maximize effectiveness and minimize costs. A cost-effectiveness study is based on operation research techniques and mathematical modeling. It is therefore driven by the quantifiable input data such as threat, capability, effectiveness data-firepower, ammo expenditure rates, vulnerability and costs.

The inherent structure of a model which is to simulate the combat situation and weigh the cost-effectiveness of the system has many flaws. Foremost among these is the fact that a combat situation cannot be accurately depicted by any simulation. There are just too many variables, situations and imponderables. No model can represent and quantify reality. In using a model to determine the effectiveness of tank battalions equipped with alternative tank mixes, for example, the results can only indicate which mix is superior. But the degree of superiority is almost meaningless because of the perplexity of the problem. A model generally analyzes the cost and effectiveness separately and then selects the preferred alternative.

In measuring effectiveness, or military worth, reliable quantitative data is absolutely necessary. Sometimes it is not available, and when available, it may not be to a common standard of measurement. There are both tangibles and intangibles to consider

in weighing the effectiveness of equipment. The tangibles as related to armor systems include: firepower, target acquisition, mobility, vulnerability, availability, reliability and maintainability, which all require detailed data. It must also be remembered that more often than not, the new system will prove to be the most effective—especially since it is often based on a materiel need which often pushes a "state-of-the-art" that is of times unattainable.

But many of the most important factors determining real effectiveness cannot be measured nor are susceptible to calculation. Among these are: variable terrain features, weather, seasonal changes, courage or bravery, morale, the quality of training, the ability and judgement of leadership, and tactical application of the principles of war such as surprise, mass, maneuver and security.

Furthermore, despite attempts toward total objectivity, where cost can be measured, effectiveness is often dependent upon a viewpoint. On a tank the most important characteristic dictating effectiveness may be firepower to one person but mobility to another. How these characteristics are weighed in reality depends upon the commander and his experience.

Costs are, or should be, more readily available. And good, standardized cost estimates must be obtainable. Great strides are being made via the new management tools to insure this. Additionally, the new requirement for a parametric cost estimate will protect against making underestimates. In the cost estimate of a weapon system's life cycle, all cost categories to include research and development, procurement, operating, personnel and construction must be considered. Inflationary and peace or wartime conditions, disruptions, possible program reorientations and necessary subsystems, also impact on the total cost. In the past, many of these have been partially responsible for cost growth during the acquisition cycle.

In the final analysis, cost-effectiveness studies on the whole can provide insights by being a useful tool. But they are only that. Too many studies have been conducted to emphasize the need for, or justification of, a given weapon system.

The *XM803* is a prime example. Seventeen major studies were conducted under Army auspices and all recommended continued development, with occasional modifications of the new tank. The result, nine years after initiation, was an expenditure of over $300 million and termination of the program. Many of the cost-effectiveness studies were duplicated efforts which common sense and educated judgement could have negated.

The Army's experience with the *XM803* and cost-effectiveness should provide a lesson to be long remembered. It is interesting to note that Congress was concerned that the increases in effectiveness of the *XM803* over other tanks was not worth the costs. This makes it necessary to reemphasize the point that cost-effectiveness studies are only an aid to the decision-makers as part of the overall management process in choosing between alternatives. In the case of the *XM803*, it appears that no alternative systems were ever seriously considered.

In general, the proliferation of cost-effectiveness studies has not proved cost-effective. Many have been totally unnecessary or misused, as could be the case with the *XM803*. Mr. Packard has now stated that DOD should put more emphasis on hardware to demonstrate capabilities and less on paper studies to describe them. As experience has shown, nothing could be closer to the truth. The Laird-Packard approach to the management of weapon systems acquisition does just that: it emphasizes reliance on facts, hardware and reality, instead of a reliance on unproven theories. This is evidenced by new programs to initiate development by competing prototypes and to operationally test new systems before a decision is made to produce them.

Will the present management system survive and be allowed to mature with the departure of Mr. Packard and the completion of Mr. Laird's term as Secretary of Defense? Let's hope so, for it provides the mechanism for the most cost-effective approach to weapons acquisition that DOD has yet attempted.

MRS. BRENDA W. ATKINSON is the systems branch chief, Manpower and Forces Direcorate, Office of the Assistant Chief of Staff for Force Development. She is responsible for the development, improvement and analysis of methods for programming the Army's force structure, the Active Army military manpower program, and the civilian workforce of the Army. A graduate of the Army Management School, George Washington University and Western College for Women, Mrs. Atkinson also is a member of the Women's Committee of the National Symphony.

The combination of armor's firepower, air cavalry's versatility and airmobile infantry's speed will bring new dimensions to modern warfare.

TRICAP-

The Challenge of the Seventies

by Major General William B. Fulton

YOU, the commander of the 1st Cavalry Division (TRICAP), are moving rapidly over the battle area in your C&C chopper on a personal reconnaissance. Reports of heavy enemy pressure keep coming from your command post by way of your command console. The brigades of the 20th Division are being pushed by what appears to be the elements of two enemy tank divisions, and the corps commander has told you to be prepared to react to a possible breakthrough at any location within the corps front.

The radio brings a call from your G3 reporting a major breakthrough in the 20th Division lines. The corps commander has given the TRICAP Division the mission of stopping the enemy penetration. A look at your map tells you that if the penetration is not stopped, it could threaten the entire corps position.

What do you do? You need to move your initial containing force 40 miles in minutes. If you are going to slow the enemy's thrust, you need more tanks on the ground in even less time. The roads are jammed with refugees and the idea of moving that far, that quickly, with tanks or personnel carriers is out of the question. What you need are 80 mile per hour infantry and 200 mile per hour tank killers that can operate in a thin third dimension over the battlefield. And you need them as a team.

After a quick look at your map, you pick up your radio and call your G3. "Smith, chopper a battalion of the 2nd Brigade to the high ground vicinity MA 3974. Get them to set up blocking positions to

cut off the enemy movement down the valley. Make sure that you get the *TOW* and *Dragon* teams into position early. I want the whole battalion in position in 30 minutes. Put two troops of attack helicopters in to hit the enemy from the west; the first should be on station in 15 minutes. I want the ACCB and 3d Brigade commanders to meet me in in 10 minutes at the TAC CP to iron out the details."

Fantasy? Impossible? Maybe a few years ago. Today? Probably not. Tomorrow? Certainly not.

Our combat experience has clearly shown the devastating firepower of armor, the tree-top versatility of air cavalry, and the speed and ability of airmobile infantry. In an effort to take advantage of technological advances and these battle-tested experiences, the Army has developed a division which takes advantage of these new capabilities and which will permit our forces to operate on and over the battlefield with an integrated teamwork barely dreamed of a few years ago.

This new division is named TRICAP for the three capabilities it embodies: armor, airmobile infantry and air cavalry. To finely hone this TRICAP concept, the Army has formed such a division at Fort Hood, Texas, and is equipping it with the most modern weapons available, including tank killing helicopters and advanced night vision systems.

For the next two years, we will be evaluating the division to determine that mix of armor, airmobile and air cavalry units that will provide the greatest defense against the many threats world-wide that we must face in the 70s—and to sort out the conceptual and doctrinal problems that face us as we put together this new force.

The basic structure of TRICAP is identical to that of conventional divisions—that is, a division base and three brigades. However, it is the composition of these brigades which makes TRICAP unique. Our current divisions have the same capability multiplied three times, while TRICAP, on the other hand, has three distinct capabilities. TRICAP has a division base, an armored brigade, an airmobile brigade and an air cavalry combat brigade. Each organization has its own character and can be used either separately or in conjunction with the other combat elements.

TRICAP provides an ideal test vehicle to determine whether what we learned in Vietnam can be modified and applied to the mechanized environment of the European theater. The flexibility which can be achieved through various organizational mixes within the division will be tested for world-wide situations to which the Army may be required to react.

Although the first combat test of airmobility concepts occurred in Vietnam under counterinsurgency conditions, the airmobile concepts developed by the Howze Board and tested in Air Assault II were actually developed for mid-intensity warfare. Airmobility, as initially employed in Vietnam, entailed primarily the use of airmobile infantry integrated with reconnaissance, surveillance and firepower. Later on, armor units were routinely employed in coordinated operations with airmobile infantry.

We have validated this employment for low-intensity warfare. What is required now is a vehicle to test this same employment for mid and high-intensity combat. This is the purpose of the TRICAP test and experimentation program—to develop optimum tactics, concepts for employment, and mix of such forces as might be needed in areas other than Vietnam.

Today's concepts, which are based on our Vietnam knowledge, what we know about the NATO requirements for possible conflict in Europe, and our best guess as to land combat on the future battlefield only serve as a point of departure. Most everyone agrees that the mission of the TRICAP Division will be to conduct highly mobile operations to destroy enemy forces and to control and screen large land areas. Beyond that, we are not sure.

It is envisioned that TRICAP will be used as a covering force for the corps. With its great mobility, it certainly should be able to most effectively screen a great deal of gound. The division will be most useful as a corps reserve—able to move rapidly when needed to the critical point in the corps sector, and employed in the line next to other divisions. Its capability to rapidly shift its highly lethal firepower from one area to another will give a new dimension to the modern battlefield.

There will be problems in fielding this new division, and we already have recognized many of them.

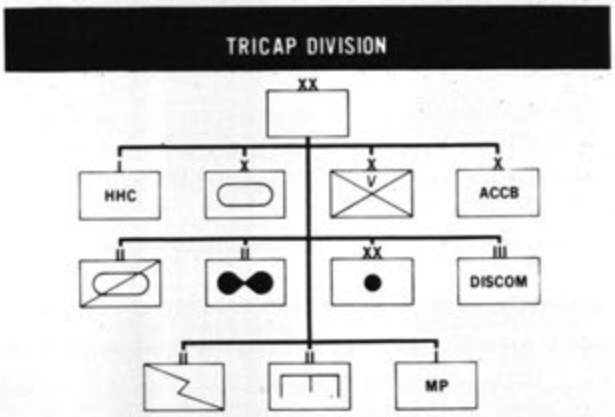
- How does the commander control such diverse forces operating over hundreds of square miles?
- Who controls the airmobile elements and attack helicopters when they come to the support of committed ground forces?
- Do we use the two up-one back doctrine in the employment of the brigades, or do we spread our tank-heavy brigade thin and back it up with the other, more mobile brigades?
- Do we operate as TRICAP brigades—a tank battalion, an airmobile infantry battalion, an attack helicopter troop and an air cavalry

troop, or do we only occasionally cross-reinforce?

We don't have the answers! Maybe you have some and we would be anxious to hear your views. Certainly in our testing at Fort Hood many new ideas will come up.

To insure that we do accomplish this, TRICAP and the Modern Army Selected Systems Test Evaluation and Review (MASSTER) activity at Fort Hood have been given a high priority for Army resources. Both MASSTER and the 1st Cavalry Division are getting top quality people who are anxious to be challenged and to be part of first-class teams. The 1st Cavalry Division and MASSTER are getting their share of new equipment—including many developmental prototypes, and the division has been given adequate resources to conduct the needed field experimentation. In short, things are happening at Hood!

Whatever the final results of the TRICAP Division test and evaluation program may be, they will not be new to Armor officers. The firepower, mobility and shock effect which we attribute to TRICAP is but a logical extension of that developed on the battlefields of World War II by Armor leaders who were also testing and evaluating a new and potent organization. The leaders of tomorrow's Army will be found in the test areas at Fort Hood.



MAJOR GENERAL WILLIAM B. FULTON is currently the director of Doctrine, Evaluation and Command Systems in the Office of the Assistant Chief of Staff for Force Development.

The British have a growing family of light armored vehicles in the . . .

SCORPION, STRIKER, SCIMITAR, SPARTAN

by Richard M. Ogorkiewicz

WHEN the British Army first began to consider a replacement for its current range of armored reconnaissance vehicles, it did so in terms of one multi-purpose vehicle. This 1960 concept called the Armored Vehicle Reconnaissance (AVR) resembled in several respects the contemporary US Army concept of the Armored Reconnaissance/Airborne Assault Vehicle (ARAAV). But whereas the ARAAV was developed into the *M551 Sheridan*, the AVR was abandoned. Instead, the British Army decided to adopt another vehicle designed by its Military Vehicles and Engineering Establishment—the CVR(T), or Combat Vehicle Reconnaissance (Tracked).

The AVR was abandoned because in 1964 the British Army had come to the conclusion that such a multi-purpose vehicle armed both with a gun and guided missiles was not a satisfactory solution. As a result, the CVR(T) was conceived not as a single vehicle but as one which would be built in several different forms. Specifically, there was to be a separate guided missile vehicle and a separate gun vehicle as well as other variants.

A total of seven different versions of the CVR(T) was in fact developed. Five of these have now been built in prototype form and one is being produced in quantity.

SCORPION

The gun-armed version of the CVR(T) has been the first and basic vehicle of the series. It was designated *FV101* and called the *Scorpion Fire Support Vehicle*. Its first prototype was completed in January 1969. (See the January-February 1970 issue of *ARMOR*.)

The *Scorpion* is a very compact, aluminum-armored light tank manned by a crew of three and armed with a turret-mounted 76mm medium-velocity gun and a 7.62mm coaxial machine gun. Its light weight of 17,500 pounds combat loaded makes it not only air-portable in standard military transports, such as the *C130*, but also capable of being lifted by helicopter, which was demonstrated in 1970 by a *S65* of the US Marine Corps.

Moreover, because of its light weight, the *Scorpion* has a nominal ground pressure of only 5psi, which makes it superior in this respect to almost all other armored vehicles. Another advantage which it enjoys is a high power-to-weight ratio, which is due to its combination of light weight with the 195bhp output of a Jaguar XK engine.

Altogether 17 prototypes of the *Scorpion* were built by the Alvis Company which took over the development of the CVR(T) series from the Military

M.V.E.E. CROWN

Pre-production version of the *Scorpion* 76mm gun light tank.

Vehicles and Engineering Establishment. In addition to being used for the usual engineering tests, the prototypes were also subjected to extensive user trials by the Royal Armoured Corps. They passed them successfully, and in May 1970, the British Army placed a production order for the *Scorpion*, as well as the rest of the CVR(T) series, with the Alvis Company. Nineteen months later, in January 1972, the first production version of the *Scorpion* was assembled at the Alvis plant in Coventry.

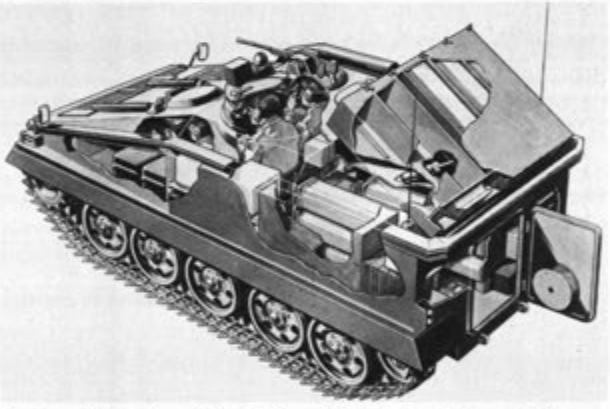
STRIKER

For all its virtues, the *Scorpion* inevitably also has its limitations. In particular, it can provide effective

fire support and kill most armored vehicles with its 76mm HESH ammunition, but it can not be expected to fight battle tanks. This task has been properly entrusted to a complementary vehicle, a missile-armed tank destroyer, designated *FV102*, or *Striker*.

The *Striker* was designed to use *Swingfire* antitank guided missiles developed specifically for the Royal Armoured Corps by the British Aircraft Corporation. The *Swingfire* is a second-generation missile with a trailing wire link. It has manual command guidance but it also has an auto-pilot and a programmed launch, which overcomes many of the shortcomings of earlier manual command systems. It also has a large-diameter shaped charge warhead which enables it to perforate the thickest tank armor at a range of 4,000 meters.

An early design of the missile launcher version of the CVR(T) incorporated a one-man turret with four ready-to-fire *Swingfire* missiles and a 7.62mm machine gun. However, as the *Swingfire* does not have to be launched pointing it exactly in the direction of the target, the idea of using a turret was abandoned. Instead, the *Striker* has taken the form of a three-man carrier. It is still based on the same chassis as the *Scorpion* but with a simple missile container-and-launcher above the rear portion of the hull. The launcher is elevated for firing and holds five ready-to-fire *Swingfire* missiles while five additional missiles are stowed in the hull.



ALVIS LTD

Sectioned drawing of the *Striker* with the *Swingfire* missile container elevated into launch position.

The first *Striker* prototype was completed in February 1972. When it is produced in quantity, the *Striker* will complement the *Scorpion* and provide light armored units with a long-range antitank capability.

SCIMITAR

Although the missile launcher version of the CVR(T) has been developed into a turretless vehicle, another turreted vehicle has also been developed. The principal reason for this is that the *Scorpion* and the *Striker* were intended primarily for what the British Army calls armored reconnaissance regiments (similar to the US Army armored cavalry squadrons), and that a somewhat different vehicle was required for the reconnaissance units of tank and mechanized infantry battalions. These already have powerful antitank and fire support weapons and any light armored vehicle for their reconnaissance platoons needs to be armed principally to deal with hostile armored personnel carriers and other light armored vehicles. A decision was therefore taken to develop a vehicle similar to the *Scorpion* but armed with a high-velocity 30mm cannon instead of the medium-velocity 76mm gun.

This vehicle became the *FV107*, or *Scimitar*. The gun with which it has been armed is the 30mm *Rarden* which has been developed specially for installation in light armored vehicles by the Royal Armament Research and Development Establishment and the Royal Small Arms Factory, Enfield. Its caliber is larger than that of automatic cannons mounted previously on light armored vehicles, and it is provided with very effective armor-piercing discarding sabot ammunition. This makes the *Rarden* capable of defeating the armor of all vehicles, except for the frontal armor of battle tanks. In particular, it can defeat the armor of all armored personnel carriers at ranges of 1,000 meters or more. At the same time, its ability to fire light but effective high explosive shells, coupled with a coaxial 7.62mm machine gun, makes the *Scimitar* suitable for a wide variety of security roles.

An unusual feature of the 30mm *Rarden* is that it is loaded with clips of three rounds and designed primarily for single shot fire, although two clips can be loaded at one time and bursts of up to six rounds are possible. This is in striking contrast to other belt or magazine fed 20, 25 or 30mm automatic guns

ALVIS LTD

***Scimitar* reconnaissance vehicle prototype moving at high speed.**

which have cyclic rates of fire of 600 to 1,000 rounds per minute. However, such high rates of fire are of little value in light armored vehicles because of the very limited numbers of rounds which they can carry. On the other hand, the design of the 30mm *Rarden* as, at most, a short burst gun made it possible to keep it relatively simple, accurate, compact and light.

One other feature of the *Rarden* which is worth noting is that empty shell cases are ejected automatically out of the turret, which eliminates the usual clutter of the crew compartment and the emission into it of noxious powder fumes.

Except for its gun, the *Scimitar* is almost identical with the *Scorpion*. Its first prototype could, therefore, be built with relative ease from the same components as the *Scorpion* and was completed in July 1971.

SPARTAN

While the *Scorpion, Striker* and *Scimitar* satisfy the primary needs of different reconnaissance units, they leave unfulfilled the need for a complementary vehicle which would carry troopers for dismounted action. This need was recognized from the beginning of the CVR(T) development and a light armored personnel carrier was designed in parallel with the *Scorpion*. The two used the same automotive components and the design of the *Scorpion* was constrained to some extent by the requirement that its chassis should also be useable for an armored personnel carrier. The most important consequence of this was that the engine had to be located at the front, alongside the driver.

The first prototype of the carrier, which was designated *FV103* or *Spartan*, was completed by Alvis in March 1971. Externally, it differs from the *Scorpion* in having a higher hull with a more steeply sloping front and no turret. However, its height to the top of the roof is still only 68 inches, while its overall width of 86 inches is the same as that of the *Scorpion*. Within these compact dimensions, sufficient room has been provided for seven men who can form an effective team for dismounted action and yet leave the vehicle adequately manned.

The seven men include the vehicle commander, gunner, driver and four riflemen. The gunner mans a rotating cupola which mounts a 7.62mm machine gun fired by remote control from within, and he would normally stay with the driver in the vehicle when the other crew members dismount. Alongside the cupola is a hatch and periscopes for the commander who does not, therefore, have to act as a machine gunner and can concentrate on his proper command functions.

There is also a large hatch in the rear portion of the roof for the other crew members and a single large side-hinged door in the rear hull plate for normal access to the crew compartment. Fully loaded, the *Spartan* weighs 18,000 pounds, which is slightly more than the *Scorpion;* however, its performance is virtually the same, and like all the other vehicles of the CVR(T) series, it can swim across inland water obstacles with the aid of a collapsible flotation screen permanently mounted on it.

ALVIS LTD

Prototype of the *Spartan* light armored personnel carrier.

SULTAN, SAMARITAN AND SAMSON

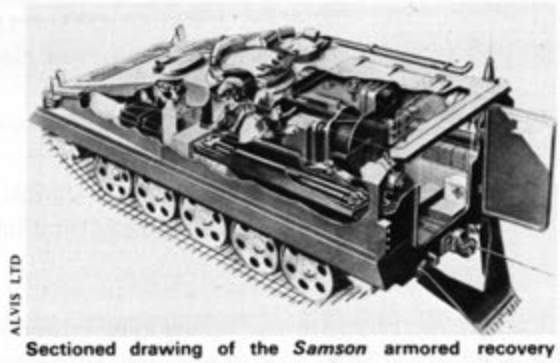
The development of the *Spartan* armored personnel carrier has also provided a ready-made basis for three complementary or auxiliary vehicles. One of them is the *FV105 Sultan* command vehicle, the first prototype of which has already been built. The other two are the *FV104 Samaritan* armored ambulance and the *FV106 Samson* armored recovery vehicle.

The *Sultan* and the *Samaritan* differ from the *Spartan* in having a higher hull to allow for greater headroom inside, larger rear doors, and no large roof hatch over the crew compartment. There is also no machine gun on the *Samaritan.*

ALVIS LTD

Scale model of the *Sultan* command vehicle with surveillance radar.

Scale model of the *Samaritan* armored ambulance.



Sectioned drawing of the *Samson* armored recovery vehicle.

Samson, on the other hand, has a large roof hatch. To be able to recover other vehicles, it has a winch and two ground anchor spades pivoted on the rear hull plate.

When the *Sultan*, *Samaritan* and *Samson* are added to the *Scorpion* and the other three vehicles, they will form a self-sufficient family of light armored vehicles which, between them, fulfill all the requirements of armored units intended for reconnaissance, counter-reconnaissance and a variety of security roles.

So far a total of about 2,600 vehicles have been ordered for the Belgian as well as the British Army under an Anglo-Belgian co-production agreement. However, considerably more may eventually be produced as other armies are also showing a keen interest in the *Scorpion* and the other vehicles of the CVR(T) family.

LETTERS TO THE EDITOR

(continued from page 5)

more complex development processes. During this period, the developer has produced many successes—but some mistakes have been made as well, when one looks back. Agencies active in the process have learned and have implemented many risk-reducing techniques as a result.

What is important now is to *all pull together*—developer, trainer and user—to execute these improved processes and turn out what the user needs: the most effective system possible. This is of paramount importance. A house divided against itself certainly cannot produce the best product. Division in our ranks in these times would be folly.

It would be next to pointless to dwell on minor errors in Colonel Tuttle's letter. I can't resist one correction, though. Following recent Secretary of Defense approval, the Bushmaster Request for Proposal for the Validation Phase went "on the street" in November 1971. Two or more contracts will be let this spring for industry's already-developed and fired concept prototypes. These will be evaluated in a shoot-off to select the best, which will then start full scale development. Plans call for fielding production weapons with production vehicles.

I too enjoyed Major DeMont's article and second Colonel Tuttle's praise of it. After Bushmaster contracts are signed, we will forward to you an article describing the program.

ROBERT W. NOCE
Colonel, Armor
VRFWS Project Manager
Rock Island, Illinois 61201

Cannon Chart Additions

Dear Sir:

Having recently got around to reading my November-December issue of *ARMOR*, I wish to make some comments on the article, "Attention Mechanized Infantrymen: This is Your Gun!" by Major Robert W. DeMont.

Although the list of automatic cannons was fairly comprehensive, with many interesting guns listed, some weapons were omitted which are of importance due to their wide usage and place in gun development history. The following partial list is included for the sake of the record.

LEONARD E. CAPON
Hawthorne, California 90250

Weapon	Bore	Country of Origin	Use	Weight of Gun and Feed (pounds)	Muzzle Velocity (ft/sec)	Rate of Fire (rpm)
Aden*	30mm	England	A	176	2,000	1,200
DEFA*	30mm	France	A			
Flak 43	37mm	Germany	A-A		2,750	180–250
GE M61 (Vulcan)	20mm	USA	A	260	3,380	6,000
			V	300		3,000
GE (Vulcan)	30mm	USA	A			
Hughes (MK 11)	20mm	USA	A			4,200
M39*	20mm	USA	A	179	3,750	1,500
MG 213/20 (Mauser)	20mm	Germany	A		3,445	1,200–1,400
MK 213/30 (Mauser)	30mm	Germany	A		1,739	1,100–1,200
NS 23	23mm	USSR	A	121	2,850	600–700
NS 37	37mm	USSR	A	375	2,850	300–350
SHVAK	20mm	USSR	A	149.6	2,649	700–850
VYa	23mm	USSR	A	145.2	2,975	650–750

A—Aircraft
A-A—Antiaircraft
V—Vehicle
*The Aden, DEFA and M39 guns are said to have been derived from the MG 213/20 and MK 213/30 guns. In turn, the MG 213 was reported to have been inspired by the Russian 7.62mm SHKAS machine gun. The SHVAK is the cannon version of this latter weapon.

THE PATTON MUSEUM

by Colonel Earl W. Sharp

DURING the past year, significant steps have been taken to make the construction of the new Patton Museum a reality. Early this year, the Cavalry-Armor Foundation completely revised their construction plans and established a realistic goal that can be attained in the foreseeable future.

The current plan envisions a $1 million building that will be constructed in four phases. Each phase, consisting of 10,000 square feet, will provide for an operational type museum. In other words, when Phase I is completed, the museum will be operational, and as money is raised for Phases II through IV, the museum will simply be enlarged. To give you a feel for the size of Phase I, the 10,000 square foot building will be one-half the size of the present firetrap building. This will be adequate to house most of the current collection that must be displayed indoors.

Significant construction cost will be saved by erecting a concrete building rather than a marble and stone one as originally conceived. Additionally, a new tilt-wall construction technique will be used, which will further reduce the construction cost. This technique permits the outer walls to be moved to a new location when the building is enlarged during the construction of Phases II through IV.

In December, General William R. Desobry met with the Cavalry-Armor Foundation and a new building site was jointly selected. The new site is located at the intersection of Chaffee Avenue and Highway 31W. The current Goldville Park, at this location, will be completely dedicated to the Patton Museum.

It is visualized that the new building will contain a research library, the Patton collection, as well as other items that must be displayed in a humidity-controlled environment. The track vehicles will be displayed throughout the park. Visitors, after touring the main building, can journey through the park by either automobile or on foot. Paths will be constructed to lead the foot traveler on a circular trip through the park to visit the ever-growing collection of armored vehicles. The picnic tables and playground equipment currently in the park will be retained. Thus, the visiting families will not only be able to visit the museum but will also be permitted to enjoy a picnic lunch while the little ones romp on the playground equipment.

The current museum is now attracting over 300,000 individuals each year. It is estimated that in excess of 500,000 individuals will visit the new, more accessible facility.

A few individuals have asked, "Why a new site? The site at Brandenburg Road and Highway 31W could also have been converted into a park." Three points were considered in the new site selection. First, over $60,000 in the cost of the utilities will be saved. The utilities, in the isolated Brandenburg site, would have to be run over a mile to the building as contrasted with utilities being readily available in the Goldville site. Second, security is better at the Goldville site. Third is accessibility. This spring, the State of Kentucky will break ground on a new four-lane, limited access, high-speed, highway 31W. The Chaffee Avenue entrance and underpass will be

completely rebuilt to include a full cloverleaf interchange. This will make it easy for visitors to exit from the highway to the entrance of Goldville Park.

So much for the new building. Where do we stand on the fund raising campaign? The date of 11 November 1971 should be put down as one of the key dates in the history of the Patton Museum. Mr. Andy Broaddus, then president of the Foundation, was able to obtain the services of Mr. John Y. Brown Jr. and Mr. John Waits. These two prominent businessmen organized a Patton Museum benefit dinner in Louisville. November 11th, which was General Patton's birthday, was selected as the date.

George C. Scott, the movie actor who played General Patton in the movie "Patton," was the guest of honor and Senator Hubert Humphrey delivered the keynote address. General James Van Fleet and Major General Joseph McChristian, as well as Mayor Frank W. Burke and Judge Louis J. Todd Hollenbach of Louisville attended. The tickets, which were $75 apeice, were purchased by large business firms in Louisville. Mr. Joe Heard (a well-known local businessman) and others sold $20,000 worth of tickets in the Fort Knox, Radcliff and Elizabethtown area. The Cavalry-Armor Foundation realized a profit of $35,000 from the dinner.

The profit was important, but the significant point was the new life that the dinner put into the fund raising campaign. The dinner was given extensive coverage by the local television stations and newspapers. As a result of the publicity from the dinner and through the efforts of Mr. Jim Cooke (the new president of the Cavalry-Armor Foundation), Governor Louie Nunn of Kentucky gave $15,000 from the State Contingent Fund. This was followed in January by a $15,000 gift from the Chrysler Corporation of Detroit. Since the first of the year, Mr. Emert L. "Red" Davis, Joe Heard, Kelly Vance and Bill Swope have raised another $20,000 from Hardin County residents. At present, there are more people working harder to raise construction money than has ever been seen in the history of the Cavalry-Armor Foundation.

Currently, the Foundation has approximately $200,000 of assets on hand, and the contractor estimates that Phase I will cost approximately $211,000. The goal is truly near at hand. More money is needed, and it is time that the Armor community put the frosting on the cake.

As a minimum, each Armor officer and non-commissioned officer should become a lifetime member of the Cavalry-Armor Foundation. This membership can be obtained for $5 and a membership card attesting to the fact will be issued by the Foundation. A beautiful certificate will be issued to any company-size unit donating an average of $1 per man. Every Armor or Cavalry unit of the Active Army, National Guard or Reserve Forces should display this certificate in the orderly room.

Also available for memorialization is the Patrons Wall in the museum. Each individual that donates $100 will have his name cast in bronze and placed on the Patrons Wall. Many individuals have donated $100, or more, in the memory of a deceased member of their family who served in the Army. For larger donations, special recognition in the form of memorials will be established in the museum. As an example, the 1st Armored Division will receive special recognition for a large contribution that the 1st Armored Division Association recently made.

Support from the Armor community is already on the way. A commanding general of an active armored division conducted a division-wide solicitation for construction money on the February payday. The commanding officer of an armored cavalry regiment has also lent his support on the February and March paydays. More help of this nature is needed.

The Cavalry-Armor Foundation is confident that a contract will be let this spring for the construction of the new museum. Your help is needed to complete the fund drive for Phase I and to kick off the fund drive for Phase II. If the history of Cavalry and Armor, from the Indian Wars through the Vietnam War, is to be preserved for posterity in a fireproof, humidity-controlled environment—your help is needed. Send your contributions to:

Cavalry-Armor Foundation
1244 S. 4th Street
Louisville, Kentucky 40203

COLONEL EARL W. SHARP is the Special Assistant to the Commanding General, VOLAR at Fort Knox, Kentucky.

While elsewhere in America women liberationists are debating their roles and trying to achieve their independence, a smaller but equally serious distaff movement is under way at Fort Knox.

Women's Liberation— Armor School Style!

by

Mrs. Michael J. Fay and Mrs. George S. Patton

ALTHOUGH programs of orientation for wives of Armor School students have been operating for some time, the Army's current emphasis on the whole family situation of its personnel has caused the Armor School staff to take a fresh look this year at what is offered to the wife of a man electing a career in Armor. The School is already well along with a program from which it hopes will emerge a happier and more motivated Army wife who can be a full partner to her husband in their Service marriage.

The growing and constantly-improving experiment presently consists of three major parts: the Armor Officer Basic Course Wives' Program, the Enlisted Wives' Outreach Program, and Ladies' Guest Speaker Program. Each program is designed to fill the needs expressed by the women themselves.

AOB WIVES' PROGRAM

In recent years, wives of AOB course students, along with Motor Officer class wives accompanying their husbands to Fort Knox, have been welcomed and entertained by Armor School staff and faculty ladies under a School-sponsored program. It has aimed at making the young wives comfortable in what is often an entirely new experience—their first Army assignment. Unfortunately, not all married students have elected to bring their brides to this nine-week course, believing that the old saying, "If the Army wanted you to have a wife, it would have issued you one," was particularly true at the basic level. (Indeed, in earlier years, the hardy wife who did come was completely on her own!)

Quite the contrary! This year the Armor School is strongly encouraging AOB students to bring their wives on this temporary duty assignment. Although the inconvenience of finding their own off-post housing still exists, this opportunity for wives and husbands to get acquainted with the Army together is considered to be of great assistance to their long-term family adjustment. Under this same principle, the School welcomes wives of Active Duty for Training officers, whose total exposure to military life may be this 90-day period before their husbands return to civilian life in a National Guard or Reserve status. The Armor School feels that it is vital to our rapport with the civilian world that these women, as well as their husbands, have a pleasant and thorough Army living experience.

Consequently, extra efforts have been made by the School and its sponsoring wives to inform the potential AOB student ladies that there is a welcome waiting for them. Letters have been sent to incoming students and to all potential sources of commission to this class: ROTC, OCS, Reserve and National Guard units, and the US Military Academy.

A varied program of enrichment awaits the student wives who do come. Wives of motor officer students attending concurrent classes are invited to join AOB ladies in the sponsored events. Although some MO wives are not new to the Army, most seem to enjoy the comraderie of being included in the AOB wife activities. In addition to mixers and orientation programs, there are such favorites as the wives' tour of the Armor School and a career briefing given by a representative from Armor Branch in Washington. The popular School tour features opportunities for the ladies to climb into the tanks and tracks that their husbands have been talking about. The Armor Branch briefing for couples is always followed by a session for the wives alone, where the briefing officer (currently Lieutenant Colonel William Roche) answers questions that the husbands would not think of, or dare to bring up!

During their nine weeks at Fort Knox, the student wives attend informal coffees where such subjects as customs and courtesies are discussed with other wives of somewhat longer Army experience. Even these talks are changing with the times. The more obsolete or specialized etiquette practices, such as the use of calling cards and required hats and gloves, are being de-emphasized in favor of more important issues, such as community involvement, one of the most meaningful of all Army customs and traditions. Community volunteers are actively solicited from the basic course wife group, with the rationale that if the ladies have their ice-breaking experience here, they will be willing to give service at their next, more permanent station.

AOB wives make their own ice cream sundaes at a gathering at the Commanding General's quarters.

Student wives are encouraged to ask frank questions and expect frank answers about the serious issues of Army life: the challenges of separations and living overseas, the problems of poverty, racial tension, inadequate housing and others. Formalities are intentionally kept to a minimum with this group. A Quarters One invitation for the basic course ladies, a gathering held at the home of the Commanding General, Major General William R. Desobry, may find the guests sitting on the floor with the Commanding General's wife, discussing hospital care over ice cream sundaes.

Basic student wives are not the only ones receiving distaff attention at the Armor School. Their senior sisters, the Armor Officer Advanced Course wives, also get their share. However, this group, with more experience-years behind them and with nine months to spend at Fort Knox, is considered to be more independent. They develop their programs largely by themselves, gaining practice for future responsibilities in their Army lives. Although they may seek assistance from the sponsoring field-grade couple assigned to each AOAC class, this distaff group is truly and deservedly on its own.

The contribution made by AOAC ladies to the Fort Knox community has always been dynamic and invaluable. These wives traditionally have volunteered their talents in all areas of post activity. Often they raise impressive amounts of money for class presentation to a worthy welfare need. Many an AOAC ladies' graduation function is marked by the awarding of Armor Center citations for outstanding community service to several class wives. The successful record of AOAC distaff independence speaks for itself.

An AOAC wife receives a certificate of recognition from Colonel James N. Rowe for outstanding community service.

ENLISTED WIVES' OUTREACH PROGRAM

By no means forgotten are the Armor School enlisted wives. They are the focus of the second major part of the ladies' program. When an analysis of the enlisted wives' program revealed many unfulfilled needs, the School's senior NCOs and their wives, led by Command Sergeant Major and Mrs. Paul W. Squires, initiated an outreach effort. Its purpose was to identify and involve in the School and Fort Knox community activities all wives of enlisted student and staff personnel, especially those living off-post.

Many of these wives are very young and new to the Army, and with husbands of E4 rank level or below, they are often subject to particularly acute hardship problems. To draw all the School's enlisted wives together, a monthly coffee series has begun, with sponsorship rotating among NCOs and their wives from all departments. In addition to the opportunities to meet other ladies, the coffee programs offer practical briefings, such as commissary practices and advice on budget planning. A monthly enlisted highlights calendar is also sent home with every Armor School NCO and enlisted man, with firm instructions to read it with their wife.

The Armor School offers special activities to the wives of its NCO Basic Course students. Although not as numerous as their AOB counterparts, they are given similar attentions. They are greeted at orientation coffees by NCO wife sponsors. As with the officer couples, they and their husbands are welcomed at their own Commandant's Reception by either the Armor School Commandant, Major General William R. Desobry, or the Assistant Commandant, Brigadier General George S. Patton, with their wives. School tours are also held for this group of wives. These tours are organized and guided by School NCOs, who give the ladies an enlisted husband's viewpoint of his working environment.

A particular boast of the School's enlisted wives' program is that it retains, as part of its family, the waiting wives and widows of former School personnel who are living in local civilian communities. When trouble strikes, the School family is as quick to respond to the needs of these members as to its assigned personnel.

Cooperation has been effected by the Armor School with two other excellent post-sponsored programs of outreach to enlisted wives. One, is a home visitation and information service administered by Army Community Service. The other is a full range of interest activities, especially designed for young enlisted wives, sponsored by a Fort Knox service club and its dynamic director, Miss Margaret Collier.

An NCO instructor explains driver trainers during a tour of the Armor School.

The ACS program seeks to send a welcoming volunteer visitor to each off-post enlisted newcomer's home, to put into the wife's hands helpful information on post agencies and activities. The volunteer takes the time to explain the unfamiliar, to offer the friendship of the military community, and to encourage the wife to come onto the post and let it serve her needs.

The Service Club project offers this comfortably familiar location as the setting for a young enlisted wife's initial experiences with getting involved in a service community. At first, the activities are geared to her enjoyment, featuring bridge, sewing and other recreational and learning programs which especially appeal to this group. (A babysitting service on the premises is a helpful attraction.) Later, as the young women increase their self-confidence, they will be encouraged to more contributing projects—but the first step is to make them feel at home in the Army community.

GUEST SPEAKER PROGRAM

The third and newest Armor School distaff activity is the Ladies' Guest Speaker Program. This series is administered by a board of ladies representing all husband-rank levels of the School. Held one evening a month, its programs have been opened to women of the whole Fort Knox community. Geared to the Army wife's special interests, programs already have shown great variety and imagination.

A Kentucky police officer demonstrates an effective protection measure during his lecture on women's self-defense.

State Police officers gave a presentation on ladies' self-defense. Mrs. Ruth Patton Totten, an Army widow and author, spoke on "The Army Wife's Heritage: Ladies of the Old Army." The Commanding General's Special Assistant for VOLAR, Colonel Earl W. Sharp, explained that important program and its relation to Army wives and families, giving his audience full dialogue time in a lively question-and-answer session afterward. Local Kentucky color, ecology, volunteer work and hospital practices are subjects due for treatment by future guest speakers.

All of these distaff programs are kept flexible and responsive to the actual interests of the wives because the Armor School is willing to ask the ladies' opinions, and then listen to what they have to say. One important finger on the feminine pulse is the after-action critique. For example, all AOB and MO students' wives are asked for their thoughts and criticisms on the ladies' program they have just completed. Of 160 questionnaires recently tallied, 122 took the time to praise the program and its sponsors. Criticisms received are now catalyzing refinements in the program: improved communications, better area maps and encouragement of student wife leadership.

When a recent poll of all School wives revealed an interest in learning more about their military heritage and the history of Army customs, the School and the senior staff and faculty wives began designing a presentation of these worthy subjects. As a reviewer put it:

Among the wives polled, there appears a trend

of definite concern for both heritage and human beings. The ladies indicate a desire to learn the history of military customs in order to appreciate and observe them better. The meaningful traditions they are willing to keep, but not the obsolete.

One goal of the Armor School wives' program is expressed in this comment, made by a staff and faculty wife:

I believe that the military wife should be recognized as an independent person, who is not just an extension of her husband's role and/or rank.

Certainly the wives' program is trying to encourage that independence, while fostering its compatibility with the career of an Army husband. A basic student wife's critique indicates that efforts in this direction are bearing fruit:

I really thought the program was excellent. I seriously doubted if I would ever enjoy Army life. I thought I would be alienated . . . with no friends and little to do. Once I became active in the student wives' program, however, my attitude changed completely. The program made me, as a wife, feel important too.

Comments like this do not mean that wives have attained Nirvana at Fort Knox, but they are heartening. They verify that a need does exist for new recognition of the women in the Army family today. They indicate, too, that at Fort Knox, through these tentative, experimental programs, the need is beginning to be answered.

MRS. MICHAEL J. FAY, a graduate of Vassar College and the Johns Hopkins School of Advanced International Studies, is the volunteer public relations coordinator for ladies' activities at the Armor School, Fort Knox. Mrs. Fay is the wife of Captain Fay, an instructor at the Armor School and a recent Armor Officer Advanced Course graduate.

MRS. GEORGE S. PATTON, an Armor-Cavalry daughter and the granddaughter of two former Chiefs of Cavalry, is the wife of Brigadier General George S. Patton, Assistant Commandant of the Armor School. She is a graduate of Sweet Briar College, a long-time Army Community Service and American Red Cross volunteer, and the mother of five children.

1972 Armored Divisions Annual Meetings

1st ARMORED DIVISION
17-20 August, Louisville, Ky.
John McNutt, 12 Greymore St., Chesterfield, Mo. 63017

2d ARMORED DIVISION
12-16 July, San Antonio, Texas
Martin B. Richard, 1943 Potwin Dr., Baton Rouge, La. 70808

3d ARMORED DIVISION
20-22 July, Chicago, Ill.
Paul W. Corrigan, 38 Exchange St., Lynn, Mass. 01901

4th ARMORED DIVISION
27-29 July, Indianapolis, Ind.
Thurman M. DeMoss, 49 W. Madison St., Franklin, Ind. 46131

5th ARMORED DIVISION
10-12 August, Minneapolis, Minn.
Mrs. Claire Watrous, 8549 Lowell St., St. Louis, Mo. 63147

6th ARMORED DIVISION
26-29 July, Louisville, Ky.
PO Box 492, Louisville, Ky. 40201

7th ARMORED DIVISION
17-19 August, Winston-Salam, N.C.
Ray C. Wall, 942 Rock Spring Rd., Winston-Salem, N.C. 27105

10th ARMORED DIVISION
1-4 September, Philadelphia, Pa.
James W. Bierce, PO Box 1025, Langley Park, Md. 20787

11th ARMORED DIVISION
15-20 August, Las Vegas, Nev.
Ray S. Buch, PO Box 108, Pittstown, N.J. 08857

12th ARMORED DIVISION
27-29 July, Dayton, Ohio
Warren Maue, Rt. No. 2, Box 154, Germantown, Ohio 45327

14th ARMORED DIVISION
27-30 July, Asheville, N.C.
Everett E. Hill, 1808 Marie Ave., So. St. Paul, Minn. 55075

16th ARMORED DIVISION
10-13 August, Dayton, Ohio
Lester Bennett, 5820 Recamper Dr., Toledo, Ohio 43613

1st CAVALRY DIVISION
4-6 August, Kileen—Fort Hood, Texas
PO Box 63, Kileen, Texas 76541

Armored Cars: The V100 and V150

by Lieutenant Colonel Roy F. Sullivan

Experience in Vietnam has added many "layers" to Army doctrine and theory concerning operations, logistics and training, some of which will be washed from use by time and the conventional environment. Among these additions was our employment of the armored car, unused since World War II.

The need for a lightly-armored wheeled combat vehicle was quickly realized in Southeast Asia to provide limited reconnaissance, convoy and installation security. The requirement was answered in 1965 by our purchase of the *V100* armored car for the South Vietnamese Army. Two years later, the *V100* had been field tested and procured for the US Army as the *XM706E1*.

The *V100* is a 4x4, angularly-sloped vehicle armed with twin 7.62mm machine guns and driven by a V-8 engine. Also known as the "Duck" for its amphibious capability, the *V100* is fast (60mph on roads), maneuverable (turning radius of 23 feet) and has power brakes and steering. It has a high silhouette (92.5 inches over the turret) and a high road clearance (27 inches under the hull). Most importantly, the *V100* satisfied the limited missions intended for such a special purpose vehicle. It provided security where thin-skinned machine gun jeeps could not and where heavier-skinned tanks, *M551s* and armored personnel carriers should not.

Recently, the manufacturer of the *V100*, the Cadillac Gage Company, introduced a new family of vehicles, dubbed the *V150*, which incorporates im-

V-150 20MM

V-150 90MM

V-150 81MM MORTAR

V-150 DUAL MACHINEGUN

V-150 COMMAND

V-150 A.P.C.

provements and corrections to the *V100*. The new *V150* family includes six vehicles for light reconnaissance, mechanized infantry and security: a twin machine gun car; a car mounting a 20mm or 90mm gun; a fold-back top version for the 81mm mortar; an armored personnel carrier; and a command car.

Major differences between the *V100* and *V150* are in the armaments and two additional options: a diesel engine and an automatic transmission.

The armaments available with the *V150* include:

- A manual turret housing the twin 7.62mm machine guns, or a combination of .30- and .50-caliber or a 7.62mm minigun.
- A power turret for either a 20mm automatic or a 90mm manually loaded gun.

Turretless versions of the *V150* are provided for the 81mm mortar carrier, the command car and the armored personnel carrier. The latter can transport 12 combat loaded troops.

The current interest in the 20mm gun calls for a closer look at this armament option. (See Major Robert DeMont's article, "Attention Mechanized Infantrymen: This is Your Gun!" in the November-December issue of *ARMOR*.) The gun, made by Oerlikon, is the model 204GK. The rate of fire of this belt-fed automatic varies from 1 to 1,000 rounds per minute. The gun-linked sight is an 8-power periscope with projected reticle. The 20mm as well as the 90mm turrets have coaxial 7.62mm machine guns.

The *V150* weighs more than the *V100*, with a combat load of 20,000 pounds versus 16,250, and has heavier axles and suspension. The power plant propelling the *V150* may be the gasoline engine used by the *V100* or the new diesel. The new axle with a greater reduction ratio is used with the gasoline engine. This increases the torque to where the *V150* climbs a 60 per cent slope (fully loaded) as opposed to the 50 per cent capability of the *V100*. The increased torque is bought at the expense of the vehicle's top speed, which is reduced to 55mph.

The Cummins six-cylinder diesel is naturally aspirated and develops 155 horsepower at 3,300rpm. Displacement is 378 cubic inches. Torque ratings range from 237 foot/pounds (149bhp at 3,300rpm) to peak at 289 foot/pounds (105bhp at 1,900rpm). Power train options are the five-speed manual transmission used with the *V100* or the new three-speed automatic transmission.

Like the *V100*, the *V150* is amphibious. It may be driven into the water at speeds up to 40mph without special preparation. Run-flat tires (size 14:00x20) are capable of continued operation for 25 to 50 miles after penetration by small arms fire. A 10,000-pound

winch is standard with all the *V150s* for self-extraction and recovery. With a snatch block, this winch can deliver a maximum of 20,000 pounds of line pull.

The machine gun version of the *V150* carries a complement of four as did the earlier *V100*: driver, gunner, radio operator and commander. However, it can carry ten. The 20mm and 90mm models have a three-man crew—driver, gunner and commander—but they can carry up to eight. The other *V150* configurations vary from a complement of four (machine gun car) to twelve (armored personnel carrier).

COMPARISON CHART

	V100	V150
MAIN ARMAMENT	Twin 7.62mm mg	Manual turret–Twin 7.62mm mg or .30–.50 cal combination mg Power turret–20mm auto or 90mm manually fed w/coax 7.62mm mg
POWER PLANT	Gasoline V-8 210hp (M75)	Gasoline V-8, 210hp (M361) or Diesel V-6, 155hp
POWER TRAIN	Manual 5-speed	Manual 5-speed or Automatic 3-speed
PERFORMANCE		
Land Speed	60mph	55mph (manual), 58mph (auto)
Water Speed	3.2mph	3mph
Vertical Obstacle	24"	24"
Side Slope Climb	30°	30°
Cruising Range	425–600 miles	425–600 miles
DIMENSIONS		
Weight, Cbt Loaded	16,250lbs	20,000lbs
Length	224"	224"
Width	89"	89"
Height Over Turret	96"	100" (20mm/90mm turret) 97" (Twin mg turret)
Ground Clearance	16" (under axle) 27" (under hull)	15" (under axle) 25" (under hull)
Wheelbase	105"	105"
Tread	73.5"	76.5"
ELECTRICAL SYSTEM	24 volts	24 volts
FUEL CAPACITY	80 gallons	80 gallons
WINCH CAPABILITY	6,500lbs	10,000lbs

The *V150s* have a driver/observer hatch, two side doors and a rear door. The turreted *V150s* have two hatches in the cupola while the non-turreted models have a single top hatch. Ring mounts and pintles for crew-served weapons can be installed as can smoke grenade launchers.

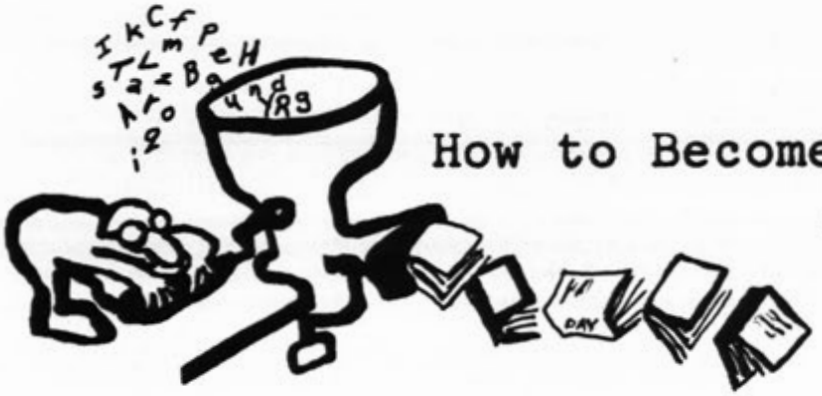
The performance of the *V100* armored car in Vietnam was good and the vehicle was generally acclaimed by its users, predominately military police units. Specific roles of the car included lead and trail convoy guards, cordon and search operations, and for security in built-up areas and base camps.

As might be imagined, the *V100's* simultaneous introduction to the US Army and combat in Vietnam caused several maintenance and training problems. Among the deficiencies of the *V100* were frequent rear axle failure, usually caused by overloading or by the driver's popping of the clutch. This deficiency was the prime factor leading to the design of the *V150* with oversized axles.

Other improvements sought were easier entrance and exit through the two side doors, and the addition of a 40mm grenade launcher to the cupola. A dual brake system and an additional vision block for the driver were also suggested. The *V150* can be fitted with the 40mm grenade launcher and has the other improvements.

The importance of our Vietnam experience is that the *V100* can be successfully employed in limited missions, freeing mechanized, armored and cavalry units from performance of routine security and convoy duties. It will be interesting to see if the employment of armored cars is one of the new layers of technique garnered in Southeast Asia which will outlast the era of jungle fatigues and canvas boots. If it does, the *V150* family will be a strong contender.

LIEUTENANT COLONEL ROY F. SULLIVAN is assigned to the Office of the Assistant Chief of Staff for Force Development.



How to Become a Poor Writer

by Lieutenant Colonel John G. Cook

Everybody and his brother (including aunts, uncles and cousins) have written articles expounding the virtues of good writing techniques. Unfortunately, most people harbor the opinion they are good writers and no need exists for them to read, "How to Improve Your Writing." This universal attitude has produced innumerable authors—but, *no readers!*

Assuming that my assessment of the author/reader ratio is correct, this article should be high on the reader interest list since it exposes the finer points of gaining eminence as a *poor* writer.

When it comes to poor writing, I am an authority without peer. I've practiced the art for the past twenty-five years without once being caught writing a paper *everyone* understood. My credentials are impeccable, uncontestable and imperishable. I know all there is to know about poor writing.

I just barely failed high school English; and I continued my assault on the English language—now pay attention—when I did not flunk English 1, my first year in college . . . until the second semester. So, don't look down your nose at my creditability—I've earned my spurs in a crucible filled with obfuscation, ambiguity, obscure antecedents (whatever they are), dangling "duhinkies" and split infinitives (still can't recognize one).

I am living proof of Chisholm's third law of human interaction. This law—found in an article titled, "The Chisholm Effect" by Francis P. Chisholm*—states: *"Purposes as understood by the purposer will be judged otherwise by others."* The corollary to this law is: *"If you explain so clearly that nobody can possibly misunderstand, somebody will anyway."*

The basic groundwork for the establishment of this law is attributed to automobile warranties, politicians, finance companies, first sergeants, lovers, campaign promises and my boss who constantly asks, "Don't you ever understand anything I say?"

I won't waste your time discussing the nitty-picky means of poor writing—every dummkopf thinks his approach is superior to any other. So, I will direct my special talents to the foolproof, timetested methods of achieving sophisticated and exotic misunderstandings through unparalled poor writing techniques. Verily, I've left no stone unturned in my exhaustive search for examples worthy of your consideration.

Now then, if you aspire to be a successful poor writer, your first and foremost concern (after sharpening your pencils) is to FORGET THE READER. Let's face the facts—why are you writing the article? For the joker who has to read it, or to project your own image of professionalism, knowledge and wisdom? Of course, *you're writing for yourself.* Never lose sight of that guideline. And, should your critics and reviewers allude to this alleged fault, remember—they are probably jealous.

I would like at this time to acquaint you with a check that will give you instant feedback on the potential success of your writing: If *any* reader can get past the title page without experiencing deep trouble deciphering your subject, you are on the threshold of becoming a failure as a poor writer. To avoid pitfalls of this nature, I've listed three general precautions you should observe:

☞ Do not foolishly research your subject matter. You are the expert. You already know more than anyone else; and the stuff you don't know you can fake—right?

☞ Avoid giving the reader any inkling, or insight, as to the central theme of your topic. The keynote is *vagueness.* Cloud the issue with numerous and irrelevant thoughts and sidelights—never get to the main point. You have the reader with your heel at his throat—show no mercy.

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*This article appears in a superb and humorous anthology entitled: *A Stress Analysis of a Strapless Evening Gown* edited by Dr. Robert A. Baker Jr., formerly of the US Armor Human Research Unit at Fort Knox, Kentucky and now chairman of the Department of Psychology at the University of Kentucky.

☞ Now for the coup de grace—make a dedicated and concerted effort to express yourself well above the reading level of the people most interested in your views. If you don't follow this rule, some wiseacre might get the idea he knows what you're talking about—which could be embarrassing! Above all, you can't afford to lose face.

With these general rules in mind, lets proceed to some of the more basic fundamentals. A lack of an extensive vocabulary is no drawback to poor writing. Simple, straightforward words such as years, me, to, when, my, took and old can be effortlessly strung together to confound and thwart the most agile-minded reader. For example, try this on for size: "When three-years-old, my great-grandfather took me to a baseball game." Since it is somewhat unusual for a great-grandfather to be three-years-old, your reader will be stopped cold. The technique used is known as misplacing the modifer. The trick here is to make absolutely certain *that every modifying word, phrase or clause does NOT—repeat—NOT logically connect with the word it modifies.* Truly, this is one of the most magnificent rules to successful writing—MASTER IT!!

Should you possess an extraordinary vocabulary—or better yet—think you do, you are home free. What a macaronic jubilarian (get the idea?) you will have illustrating your professionalism with polysyllabic jargon. Make no effort to determine the shades of word meanings. Generously sprinkle acronyms and unexplained abbreviations wherever you suspect the reader might begin to acquire a coordinated thought—*do not surrender the initiative!* Use your vocabulary as you would a rapier—if a word touches your poetic soul (even though the word has little or no relation to your expressed thought)—*stick him with it!!* Avoid, as you would the plague, being specific, concise and simple.

Here is an example for you to study:

> . . . in the current stages of the ongoing post-attack productivity study, the identification of the enervating effects of a decreased caloric diet upon physical productivity indicates the need to plan, preattackwise, for adequate caloric food stockpiles. . .

Isn't that beautiful? What'd he say??? (Since we are in the initial stage of our poor writing program, I'll translate—he said: "Store food before an attack, so people will be fit to work after the attack" . . . I think.)

I haven't covered all the fine points of poor writing, but I have addressed those of primary importance. To bouy your resolve to become an outstandingly poor writer, I have one final example. This example embodies everything you have learned to this point; and, its all in one short sentence. Unbelievable? Not so. The author is unknown to me—but be assured—*he is my idol!* I usually reserve this example for postgraduate study, but in this instance, perhaps now is the time. The sentence I am going to quote is grammatically correct: "Simians indigenous to Pogo Pogo are destitute of caudal appendages."

The teaching point presented illustrates that: owning a vocabulary second to none; being a strict grammarian; and having a purist attitude toward sentence structure will in no way place a restraint on your ability to write poorly. I'm sure you recognize the sentence as being pompous; yes, and for as short as it is—verbose (one of our better poor writing techniques).

Next, the author wanted to rewrite the sentence, using fourth grade verbiage, and still confuse the reader. He had a problem. How could he tell us that monkeys in Pogo Pogo were tailless, and still fog the issue? Actually, he had a choice of three sentence structures, and as you will see, he adroitly avoided the hidden traps:

1. "Monkeys in Pogo Pogo have no tails." (This he discarded, because it left no doubt that monkeys in Pogo Pogo were tailless.)

2. "Pogo Pogo Monkeys have no tails." (Again, with the born insight of a poor writer, he threw this version out—it, too, clearly stated that Pogo Pogo monkeys were tailless.) Genius that he was, he selected the third choice.

3. "Monkeys have no tails in Pogo Pogo." (Instantly, the reader asks, "Where are their tails, if they aren't in Pogo Pogo? I wonder if they are tailless?)

The writer was victorious!! (Do you recall my pointing out that a vocabulary was not necessary to achieve success as a poor writer?)

In conclusion, my compatriots, perseverance is the keystone to poor writing—steadfastly remain devious, verbose, self-important and unintelligible and your success as a poor writer will be assured.

LIEUTENANT COLONEL JOHN G. COOK, USA-Retired, served in the 4th US Cavalry in 1932. He retired in 1956 and has been a writer/editor with the US Army Combat Developments Command, Armor Agency since 1969.

Why is TAMMS only marginally effective?
A committee sets out for documented reasons
in order to recommend changes to streamline
and make the system more effective and efficient.

The Army Maintenance System Simplication Study

by Major James A. Wilhite

The complaint often heard about the Army Maintenance Management System (TAMMS) is that the system is too complex, almost overwhelming. While complexity may be a factor, it is probably not the only reason the Army is experiencing maintenance difficulties.

Training procedures or time devoted to training in the maintenance field may be inadequate when compared to increased complexity of equipment. The grade and MOS structures may be lacking. Perhaps commanders at various levels and areas are implementing the system with prejudice and not allowing it to do its job.

At any rate, the increasing concern and criticism levied against TAMMS, by commanders at many echelons, has led to the apparent conclusion that the system is only marginally effective.

Armor and cavalry have a special interest in

effective maintenance. Keenly aware of this, the Armor School has undertaken a major action to use the expertise it has gained from experience, to provide sound input and assist higher echelons in correcting system deficiencies. Accordingly, assets of the Armor Center and selected Fort Knox tenant organizations have been organized as an ad hoc committee and chartered to identify shortcomings and/or inadequacies within TAMMS, and to develop viable solutions and/or recommended changes. Representation on the committee includes officer and enlisted personnel from the following Armor School organizations:

Army Maintenance Management Department
Automotive Department
Communication Department
Doctrine Development, Literature and Plans Directorate
Weapons Department

Post units that are represented on the committee are:

USA Armor and Engineer Board
USA Armor Human Research Unit
USA Combat Developments Command, Armor Agency
USA Maintenance Board
First Training Brigade, US Army Training Center
Second Training Brigade, US Army Training Center
194th Armored Brigade

The goal of this action is a major simplification of the entire maintenance picture at the organizational level. The charter directed the following considerations:

► The study should be primarily oriented on the brigade echelon and below.

► The findings and recommendations derived must have worldwide application.

► Analysis of TAMMS requires investigation of all aspects of maintenance at the organizational level. These aspects must be examined in detail, both separately and in interaction. Some aspects are:

- Operator maintenance
- Maintenance records
- Repair parts supply and adequacy of PLL and applicable supply publications
- Maintenance reports and inspections
- Maintenance supervision
- Adequacy/simplicity of maintenance technical manuals, other maintenance publications and TAMMS implementing regulations
- Maintenance personnel structure and training provisions

Additional considerations which have been proposed by the committee are to:

► Retain the redeeming features of the current maintenance system.

► Produce a system which is applicable for both peacetime and combat.

► Develop a system compatible with simple computers.

► Simplify forms.

► Eliminate multiple data recording and submission.

► Reduce data recordings and submission at the organizational level.

► Stop requirements for recording which serve only to facilitate inspection of records.

It is often contended that previous maintenance systems were designed and based on the requirements at the National level. Requirements at the National level compounded by those at each echelon descending from it, have resulted in a multitude of forms, records and publications at the company. Presently, the battalion and its companies are engulfed by a deluge of material that is difficult to complete in peacetime and an overwhelming burden for the unit in combat. In accordance with recent direction, the Army is decreasing in size while its responsibilities continue to grow. Something must be done to allot more time for actual hands-on-maintenance and to reduce paperwork.

Convinced that there is an easier way to work and that the proverbial downhill slide can be stopped, the committee first met in late August 1971, and since has been conducting an in-depth study into the various aspects of TAMMS.

As one of the initial tasks, previous and on-going studies of maintenance-related activities have been investigated. Among others is a related system

What this place needs is a paper exterminator!

currently under development called the Standard Army Maintenance Reporting and Management System (SAMRMS). This system's purpose is the standardization and simplification of recording and reporting of material, supply, readiness and maintenance management, at *all* levels. The committee hopes to insure that an organizational maintenance system, developed through its efforts, will be used in association with SAMRMS. Thus, the system would achieve its effectiveness through greater input from units higher than the combat brigade.

Although the committee is continuing its search for documented reasons as to why the present system seems to be marginally effective, and is preparing tentative recommendations, selected members of the committee are working on pilot model approaches to an organizational maintenance system. As a preliminary step, all the basic tasks, information needs and reporting requirements were outlined, beginning with the crew/operator upward throughout the organizational level. The models are being developed to accommodate all of these factors to include scheduling, MWOs, calibration, readiness reporting and parts. They will also provide for the minimum information needed by the commander to manage his maintenance, and will include provisions for the information currently required by higher headquarters.

Investigation has shown that higher level requirements are fewer than was commonly thought. Therefore, it is the assumption of the committee that except for six forms and reports to higher headquarters, all others in TAMMS can be streamlined or redesigned as necessary without impact above the organizational level. Thus, with the exception of the essential higher level requirements, the models will be structured only in accordance with the needs of the user.

Further, there has also been considerable effort undertaken to integrate into the proposed models, the favorable concepts and procedures of civilian industry, as well as the other Armed Services. Visits to the Air Force and Navy, as well as to large civilian contractors, are continuing and have already yielded some favorable innovations.

Formal request for information concerning the study will soon be sent to various worldwide commands, but comments or recommendations by individuals are solicited. Contributions will be of considerable assistance in the following general areas.

- Aspects shown under "charter directed considerations"
- Modification Work Orders
- Equipment Serviceability Criteria and Readiness Reporting
- Scheduled Services
- Licensing Procedures, and Dispatch of Vehicles and Equipment
- Repair Parts (including PLL and DX)
- Personnel
- Training
- Definition and Determination of Vehicle Status
- Computer Compatability
- Time Factor

Anyone who would like to offer his opinion concerning the items above or other aspects appropriate to the study or model developments, is invited to send his correspondence to:

Chairman, Army Maintenance System
Simplification Study
US Army Armor School
Fort Knox, Kentucky 40121

MAJOR JAMES A. WILHITE was commissioned in Armor in 1958 from The Citadel. After a tour as an assistant professor of military science at Stetson University, Florida, he served as senior advisor to the 4th Armored Cavalry Regiment in Vietnam. A 1971 graduate of the Command and General Staff College, Major Wilhite is currently assigned as operations officer in the Automotive Department at the Armor School, Fort Knox.

The gas turbine will provide combat vehicles with greater mobility with no sacrifice to firepower and protection.

Tankers! There's a Turbine in Your Future.

by Colonel George A. Tuttle, USA-Retired

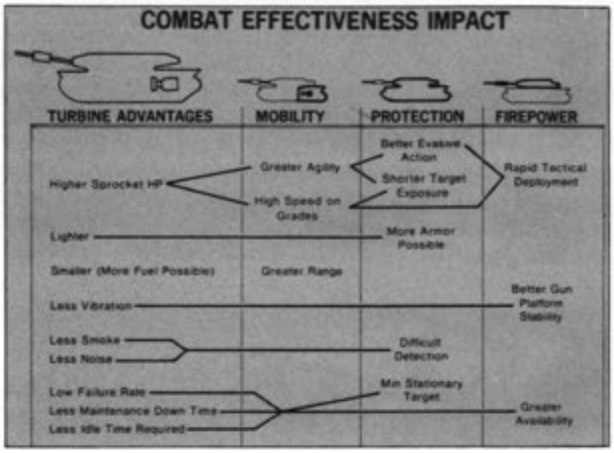
FIREPOWER, mobility, protection—these are the three factors which are involved in trade-offs in the design of any tank. They are also opposed to each other. In other words, an increase in any one usually ends up with a decrease in the other two. In the past, this has been especially true in the mobility area, where a larger power plant, to give the vehicle greater agility and more speed, has resulted in less space and capacity for firepower and protection.

The introduction of the gas turbine as a power plant for tanks and other combat vehicles will change this. The gas turbine is smaller, lighter, and more suitable from a performance standpoint than any diesel of similar shaft horsepower. Thus, its use will provide a tank or combat vehicle, which has a size and weight limitation, with more space and more weight to be utilized for firepower and protection. There are other advantages of the gas turbine as a power plant which enable it to offer further increases in firepower and protection as well as mobility.

The concept of the utilization of gas turbines in combat vehicles is far from a new one. As soon as their development was initiated, it became evident that this was an ideal power plant for combat vehicles, especially those in the larger horsepower ranges. In 1961, an article was published in *ARMOR* Magazine written by Lieutenant Colonel Robert Samz entitled (even at that early date): "Another Look at the Gas Turbine." In 1967, Captain David A. Noake wrote an article which appeared in the May-June issue of *ARMOR* called "A New Concept in Land Vehicle Propulsion." The article discussed automotive gas turbines in general, and the *AGT 1500* turbine in particular.

This current article is intended to update both of those mentioned above and discuss future plans for utilization of the *AGT 1500* turbine engine, specifically designed to produce 1,500 shaft horsepower for vehicles in the weight range of the Army's main battle tank program.

The inherent advantages of a turbine as a power plant for combat vehicles are many. First, higher sprocket horsepower for a given volume or weight in a vehicle is possible because of the inherent small size and weight of the turbine. (The 1,500 horsepower turbine weighs approximately one-half as much as a comparable diesel.) The possibility of added horsepower per ton at the sprockets, providing



increased acceleration and higher speeds, both on level and upgrades, results in a more agile and maneuverable tank.

The regenerative *AGT 1500* turbine, because of the advanced technology utilized in its design and its lower cooling losses, has a comparable specific fuel consumption to present diesel engines. This, combined with the smaller bulk and lighter weight, allows for more on board fuel and increases the range of the vehicle before it requires refueling.

When a turbine that is properly designed and optimized for vehicular application is installed, less field maintenance, fewer repair parts and less training for maintenance personnel is required.

Furthermore, time between engine overhauls, based upon aircraft turbine experience (modified to a vehicular environment) should be three times that of existing or proposed diesel power plants in similar horsepower ranges.

One of the disadvantages pointed out in earlier articles (and it was true at that time) was the lack of a production base for turbines and the high initial cost. The increased use of turbines in aircraft and improvements in production techniques have made the turbine competitive in cost per horsepower with the sophisticated diesels now being required for combat vehicles, especially in the power ranges above 750 horsepower.

INHERENT ADVANTAGES OF GAS TURBINES AS PROPULSION SYSTEMS FOR COMBAT VEHICLES

- Improved Vehicular Performance
- Small Bulk and Light Weight/Sprocket Horsepower
- Increased Range
- Less Field Maintenance
- Increased Time Between Required Overhauls
- Comparable Initial Cost/Sprocket Horsepower
- Reduced Life Cycle Costs
- No Smoke and Lower Emissions During Operation
- Lower Noise Level
- Ease of Starting and Rapid Warm-Up Under All Environments

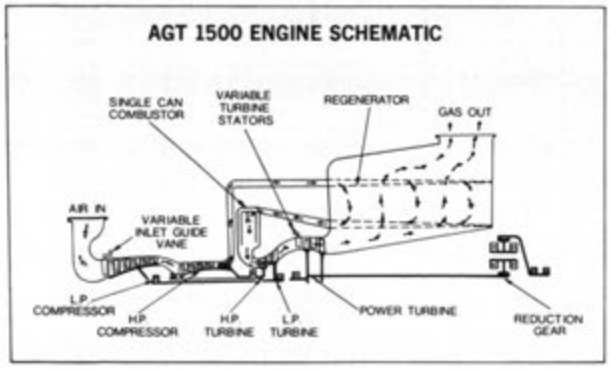
Thus, the comparable initial costs, low maintenance costs, and increased time between scheduled overhauls results in reduced life cycle costs for the turbine engine.

Another important factor is the lack of smoke not only during steady state operation but also during starting, shutdown, acceleration and deceleration. Also the noise level of the turbine is considerably less than that of the existing diesel power plants. In addition, the emissions of unburned hydrocarbons, carbon monoxide and other contaminants are also greatly reduced because of the inherent combustion characteristics of a turbine. Then, too, the turbine inherently starts more reliably under all conditions because of low breakaway torque and improved combustion characteristics. Starts are virtually immediate whether the temperature is as low as -65 degrees or as high as +125 degrees Fahrenheit. Additionally, it can absorb full load almost immediately, generally in about 25 seconds from the time the start cycle is initiated.

In the mid-1960s, the US Army Tank-Automotive Command initiated a program called the *AGT-P-1500* System Program. This was a coordinated program which provided for the concurrent development of a turbine, transmission, air cleaners, and allied systems for a 1,500 shaft horsepower power plant specifically designed for heavy fighting vehicles. Avco Lycoming was awarded the contract to develop the *AGT 1500* gas turbine to mate with an advanced hydrostatic transmission already under development by Allison Division of General Motors. Air cleaners were to be developed under separate contract with TACOM supervision.

The *AGT 1500* turbine is typical, in most respects, to all turbines now under development for automotive application. That is, it contains similar components with similar functions.

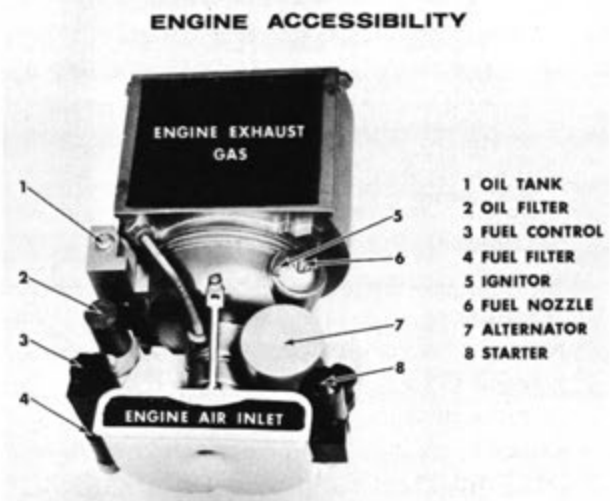
The air enters the *AGT 1500* engine through the front inlet and passes through inlet guide vanes to the compressor stages of the engine. The first, or low-pressure compressor, has all axial stages. The second, or high-pressure compressor, is a mixed axial and centrifugal compressor. The air from the compression process passes through a regenerator, or in this case a stationary recuperator, where heat is added with compressed air from the waste heat contained in the exhaust gases. Next, it passes through a combustor, where fuel is added and combustion takes place.



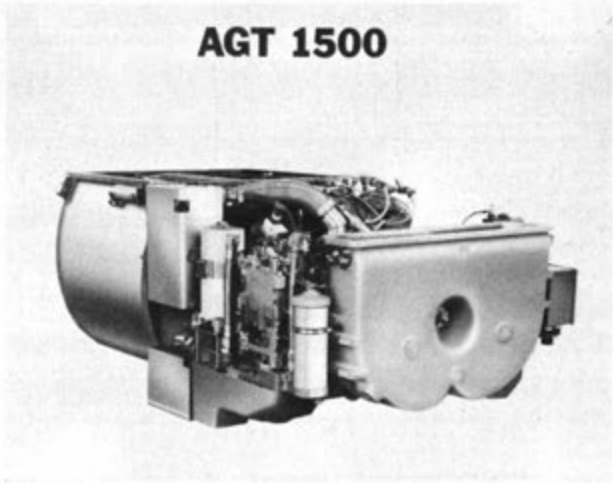
This engine has been run on CITE, various JP fuels and diesel fuel. There is a single spark plug (ignitor) which only functions during starting, and a single fuel nozzle to which fuel is metered by a fuel control. From the combustor, the hot gas passes through a scroll to the gas producer turbines which drive the compressors. The gases, with some of the energy removed, pass through a set of variable power turbine nozzle vanes (utilized to optimize part load operation) to a free power turbine connected to an integral set of reduction gears. The output from these reduction gears is connected directly to the transmission. Although some of the turbines rotate at speeds above 25,000rpm, the input to the transmission at maximum power is reduced to 3,000rpm.

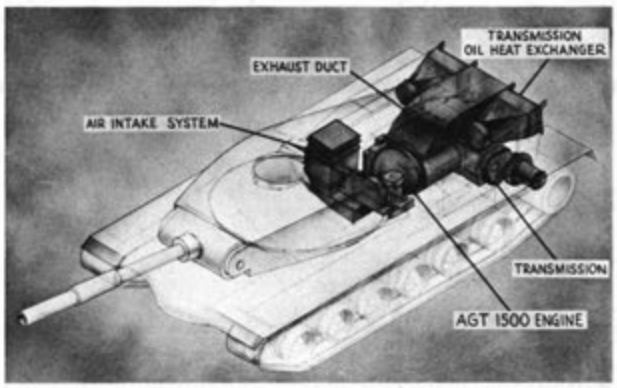
This particular design, using an advanced recuperator and the latest in turbine technology, has eliminated another of the early disadvantages of the turbines, that of high specific fuel consumption, especially at part power.

There is nothing new or magic about turbine maintenance in the field. The *AGT 1500* test rigs have run under fairly typical, dusty conditions. It is felt that there is no great problem in providing air

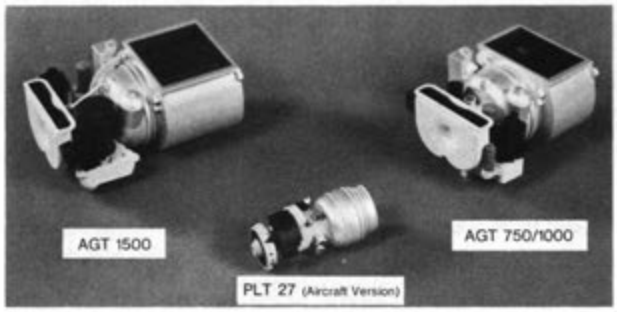


The ease of accessibility from the top of the AGT 1500 minimizes engine removals. All normal crew and organizational maintenance can be performed within this area.

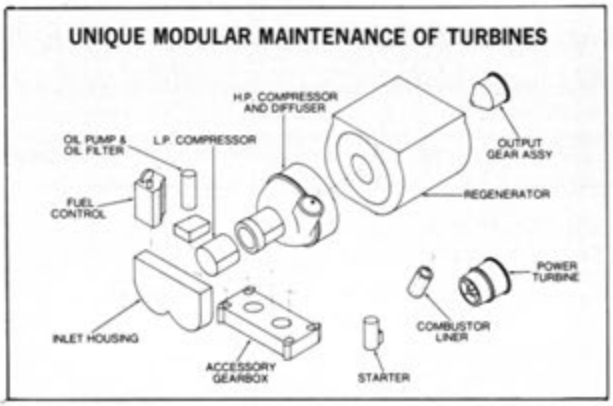




This early rig installation shows the positions of turbine components within a vehicle. Much more refined installations are now possible.



The AGT 1500 Family



The turbine consists of a series of modules which can be replaced individually without major teardown of the entire engine.

cleaners for the installation. In over 4,000 miles of rig operation, half of which was under fairly dusty conditions, no problems were caused by dust and air cleaners required very little servicing.

On the basis of over 5,000 hours of engine test operation, test rig runs, and Vietnam aircraft turbine experience (properly related to vehicular usage), it is felt that the turbine can meet reliability goals required for fighting vehicle power plants.

Another feature of a turbine is its adaptability to various ranges of horsepower utilizing proven rotating components. In other words, a family concept. For this particular *AGT 1500* series, both 750 and 1,000 horsepower ground versions are possible with a maximum compatibility of parts. A 2,000 horsepower non-regenerative aircraft version has already run successfully at a weight of 350 pounds.

Completion of the current planning program will result in a fully proven engine which will be ready for utilization in future main battle tanks. Derivative engines for other uses can follow a similar schedule.

In conclusion, the turbine, which was just a dream in the 1961 and an early development in 1967, has now reached the final stages of preparation for field use in the mid-1970s. So, Tankers, prepare for the turbine in your future and the resultant increase in combat and cost effectiveness which will accompany its use.

COLONEL GEORGE A. TUTTLE, USA-Retired, graduated from the US Military Academy in 1944. He served as an Infantry officer during World War II and transferred to the Ordnance Corps in 1951. A graduate of the Command and General Staff College and the Army War College, Colonel Tuttle's last five years of service were spent as chief of the Detroit Office of the US/FRG Main Battle Tank Program. Following his retirement in 1968, and at present, Colonel Tuttle is employed by Avco Lycoming as a developmental liaison engineer and resident engineer at the US Army Tank-Automotive Command on the *AGT 1500* Program.

integrity—

the cardinal virtue of the professional

Captain Joe Jones is a likeable guy. He is a tall, good-looking, rugged picture of the all-American boy. He is brave on the battlefield, as is attested by two Silver Stars, and on the surface appears to be just what the battalion commander has wanted as one of his company commanders.

Instead, Lieutenant Colonel Sam Mald frowns at the papers on his desk, and composes his thoughts. He must face Captain Jones in a counseling session which is going to be difficult. Captain Jones lacks the integrity to be a commissioned officer and Colonel Mald must tell him. To make matters worse, he likes Jones personally and sincerely wishes him well; but this is the third counseling session in the past six months, and the integrity question has come up each time. Joe Jones has not improved at all; his company, once the shining example of good leadership, is in ruin. There was dissension among his officers and senior NCOs, and as a result, Colonel Mald was going to have to relieve Jones.

Colonel Mald is startled out of his thoughts as the knock comes on his door. The ordeal is about to begin. "Come in."

Integrity can be defined as many things, but basically it is applied leadership in the Service. It is synonymous with honesty, truthfulness and moral uprightness. When you get through all the semantics, you are simply talking about the truth. Truth is everything in all things and must be the hallmark of the professional. There is no way around it, and half-truths or silence to protect oneself is no excuse or reason. Friendship is no excuse to bend the truth —there are no grey areas. It is there as a cold hard fact, and every situation has its truth.

Today's world is a rough place in which to live. The competition for a living and for status is fierce and the Service is no exception. As with every competitive situation, there are winners and losers, and

by major john w. schneider jr.

the shame is not in losing, but in not doing your best at all times. In other words, if you lose and have done your best, honestly, you can still keep your pride as a person. The Service adds a great deal more to the competition than does civilian life. If you lose the competition, you have a great effect on the lives of many others; therefore, there are great pressures to succeed, and the higher the rank of the man or woman involved, the greater the pressure.

It would be a simple life if everyone told the truth or even had the same view of the truth. It would also provide for a very dull existence. Unfortunately or fortunately, as the case may be, there is hardly a chance to live a dull, truthful life. Everything we are involved in tends to tear us away from the basic principle of telling the truth or living the truth at all times. Our environment attacks integrity.

Let's get back to the case of Captain Joe Jones. Joe's company, when he assumed command, was the best in the battalion. After six short months, it had no where to go but up.

Joe had started out as the CO with the firm resolution to keep the company on top. The first big event was rifle marksmanship competition. When the score cards were tallied, Joe's company was second in the battalion . . . that was until Joe went to work late that night. The next morning, Joe requested a re-tally because of some "administrative errors" that his people had made.

Joe's company tallied first in the competition, but the troops weren't fooled for a minute. They knew that they had come in second and also that the CO had doctored the score cards. Joe got some strange looks from the other officers but he ignored them as sour grapes.

The next event was the annual brigade ATT. It was rainy, wet and cold. Joe made a mistake and the company missed an assembly area by 3 kilometers. Joe radioed his coordinates to be the correct ones, where he should have been, but wasn't, and trusted the weather and darkness to cover for him. He fooled everyone but his own troops and the aggressor, who discovered the gap in the lines, went through and caused the battalion to be "destroyed." This led to a low readiness rating for the battalion. When asked about it, Joe blamed his executive officer and headquarters.

After that, the company went to pieces. Requests for transfer poured in and the situation was brought to the battalion CO's attention. Joe was counseled and verbally reprimanded.

Some weeks later, Joe's wife called his office at night because of a family emergency. Joe had told her that he was at work. He wasn't. He was located coming out of a rather well-known apartment downtown and when he arrived home, his wife, who had handled the emergency, was planning a strategic retreat from the continent and matrimony. Joe tried everything, but his wife and children left two weeks later.

Joe even lied about that, saying his wife was on a vacation even when it was evident that everyone knew the truth. Joe's professional life, already at the breaking point, got worse. Colonel Mald took the necessary action.

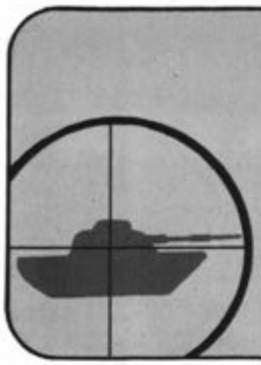
Today, Joe is out of the Army, barely earning a living, paying alimony and child support, and is a failure.

The military professional, no matter his rank, is a leader. To be a proper leader, he must follow the principles of leadership, based on a good foundation of common sense. A true professional also knows that all the principles are bound up in one cardinal virtue, that of integrity.

The Army has its problems—this no one can deny. We are being attacked from all sides by pacifists, haters of regimentation, anti-Americans, anti-militarists, those who fear the so-called military-industrial complex, and worse, from within.

The Army is battling back and making progress. The soldier's life is improving each day, and we have a better product to sell. Still, it is necessary that we, as professionals, gain and maintain an extremely high level of integrity. We must be willing to take our lumps and truthfully stand up to be counted. In this way, we neutralize the primary weapon of our detractors. We can then continue, as we have done for the past 196 years, to defend our country.

MAJOR JOHN W. SCHNEIDER JR., a 1958 graduate of the US Military Academy, has served in Europe and Vietnam. A graduate of the Armor Officer Advanced Course, Major Schneider is currently a project officer in the Ground and Air Cavalry Branch, Materiel Division, US Army Combat Developments Command, Armor Agency.



short, over, lost, or ... TARGET

This department is a range for firing novel ideas which the readers of ARMOR *can sense and adjust. It seeks new and untried thoughts from which the doctrine of tomorrow may evolve. Items herein will normally be longer than letters but shorter and less well developed than articles—about 750 words maximum is a good guide. All contributions must be signed but noms de guerre will be used at the request of the author.* ON THE WAY!!

The Ground Helicopter Transport/Trailer

by Major Paul D. Keller

IN Europe, and I suspect elsewhere, a definite need exists for a ground transport system capable of moving the present series of light observation, utility and attack helicopters for both administrative recovery and tactical requirements. This fact is appreciated by numerous air cavalry, and other aviation unit commanders and maintenance supervisors throughout the theater. Yet we continue to recover helicopters daily from field sites and airfields by other means.

Generally, medium to heavy helicopter lift is the manner of evacuation or recovery. Combined with this problem are the difficulties experienced moving helicopters in the ground mode, both in the field environment and over unimproved airfield surfaces. As every crew chief knows, the presently issued ground handling wheels are totally inadequate in ice, snow, mud and uneven ground (and what else is there in a European field environment?).

The European theater of operations is decidedly not the base areas of Vietnam and does require adjustments in the doctrine, tactics and equipment that gave birth to modern airmobile warfare. As tempos and orientations change, Europe is becoming increasingly important, and as a result, the reconnaissance, attack and utility helicopters within USAREUR are being increased and modernized. However, we persist in supplying a tactically unacceptable ground handling system with each new aircraft deployed.

Frequently, we continue to damage vital and expensive helicopter assets in routine ground handling operations or aerial evacuation and recovery lift operations. Obviously, accidents can and will occur, no matter what elaborate and extensive SOPs are followed. In Vietnam, it is a definite requirement to evacuate aircraft by aerial lift, primarily due to the lack of a developed road network and a lack of security. Both factors, a good road network and peacetime security exists in Central Europe today. But we insist on continuing with a "but we've always done it this way" approach to the problems of a nonflyable helicopter.

A different, or at least an alternate approach to recovery and ground handling operations is needed and must be developed. As existing airmobile and air cavalry doctrine is reevaluated and modified to allow for the markedly different missions, enemy, terrain and weather of Central Europe, equipment

to recover, disperse and conceal helicopter units should also become a matter of concern.

The air superiority enjoyed elsewhere will not be the case during a mid or high-intensity conflict in Western Europe. Thus, camouflage and dispersion will become extremely important to commanders in reducing the vulnerability of air cavalry and attack helicopter units to detection and attack. With the presently issued ground handling equipment organic to a typical helicopter unit, it is a near physical impossibility to move helicopters into overhead cover, concealed positions.

I suggest that the best concealment would be obtained by ground moving the helicopter into a treeline, built-up area, or isolated farm building complex offering overhead camouflage for rearming, servicing and maintenance purposes. Ideally, the dispersed and camouflaged helicopter laager areas would be passively protected by *Redeye* and *Vulcan/Chapparal* weapons. The centralized and vulnerable Southeast Asia fire base concept is a thing of the past.

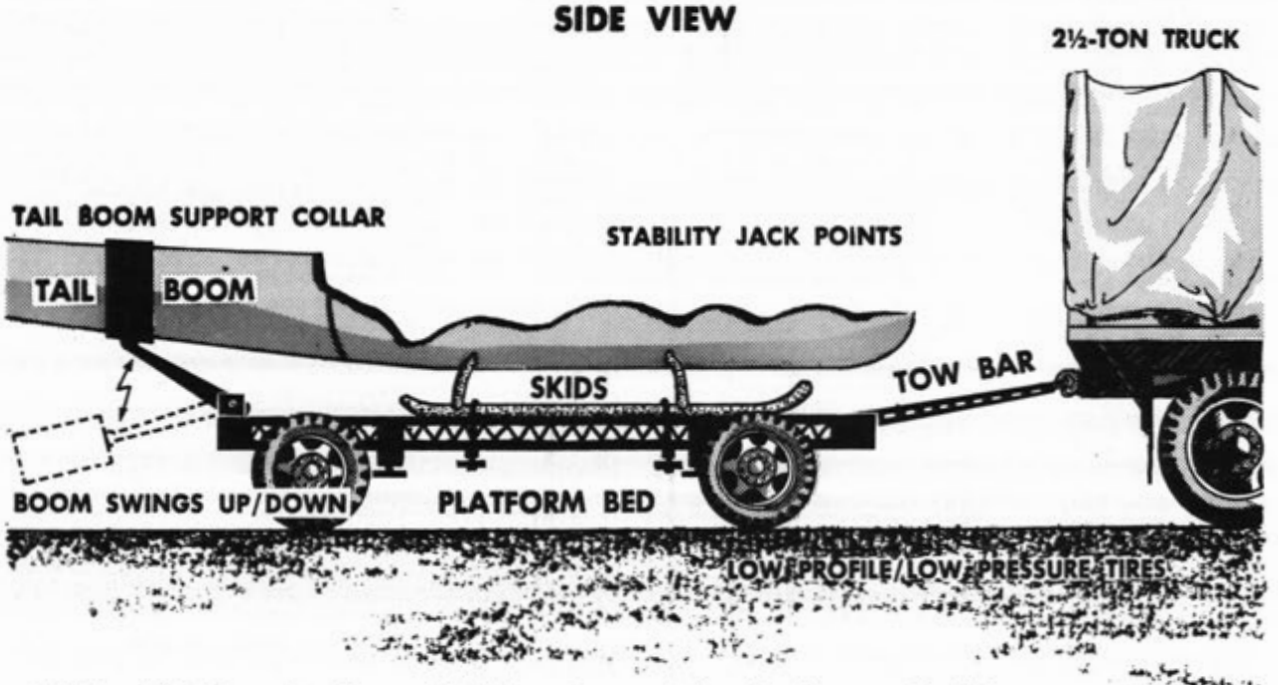
So, how do we move our helicopters quickly and safely into the uncountable thousands of treelines that are predominate on the countryside of Western Germany? The answer could be the Ground Helicopter Transport/Trailer (GHT/T).

Imagine this situation. . .an attack helicopter returns to its laager area for *TOW* missile rearming after a successful mission. The helicopter terminates its low-level approach at-the-hover and settles on to what appears to be a low-slung platform, directed by the hand and arm signals of a crew chief positioned to the front. As the roters are running down, a tail boom brace (horse collar) is swung up from the rear of the GHT/T to secure the aircraft tail boom for cross-country movement. Other personnel are busy clamping the helicopter skids to the perforated floor/bed of the GHT/T. Simultaneously, jacks are operated at each corner of the GHT/T to elevate the platform from a ground stabilized position used when accepting an aircraft from the hover. A 2 1/2-ton truck is backed into the *TOW* arms and moves the GHT/T and its mounted aircraft off the field into a nearby treeline where a rearming party and ammunition point waits in concealment. The GHT/T moves easily across the ice, snow and rutted terrain on low profile, wide-treaded, low-pressured tires. Hard to visualize? Perhaps not.

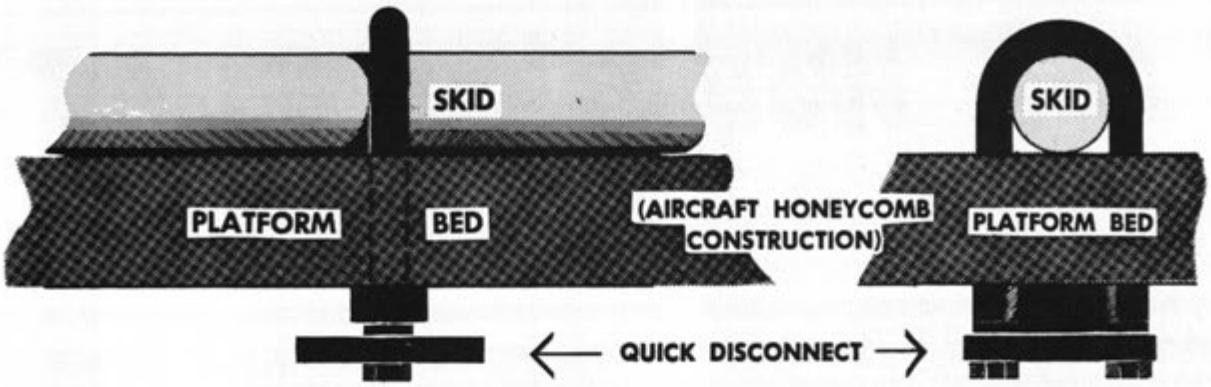
The GHT/T must be so constructed as to allow for lowering to stabilize the platform, either by mechanical or hydraulic means. A tail boom security collar is necessary to stabilize the mounted helicopter during cross-country or high-speed movement. All fastening/security brackets and clamps must have quick disconnect capabilities. The required height for the GHT/T must be under one meter fully extended to allow for rotor mast clearance of the mounted aircraft under bridges, autobahn crossovers, etc. Possibly two different sizes for the GHT/T are needed; one for the scout/reconnaissance series, a second heavier model for utility and attack models.

Table of organization and equipment authorization of the GHT/T would be on the basis of one per

SIDE VIEW



NOTE: All Joints as Tow Bar and Tail Boom Support Collar Members are Flexible



SIDE VIEW **VIEW FROM THE FRONT**

All fastening/security brackets and clamps must have quick disconnect capabilities.

2 1/2-ton and 1 1/4-ton trucks presently organic to air cavalry, attack and utility helicopter units. During frequent displacement moves, the GHT/T would move essential unit assets not transported by air. Ammunition, TOE items and bulk supplies could be lashed to the platform by webbing and lift sling equipment presently authorized. Nonflyable aircraft, for repair and/or cannibilization, would be carried on a first priority basis.

The requirement for the proposed Ground Helicopter Transporter/Trailer exists today. Valuable assets are being damaged as a direct result of the present aerial evacuation and ground movement systems. The proposed GHT/T is a suitable replacement for the present series of vehicle trailers issued to helicopter units. The simplicity of the GHT/T would seemingly add to its desirability on a cost/economy basis. The acquisition of the GHT/T would significantly improve the ability of a helicopter unit to disperse, camouflage and evacuate its assets, both administratively and tactically.

MAJOR PAUL D. KELLER was commissioned in 1962 through the ROTC program at St. Lawrence University. A graduate of the Armor Officer Advanced Course, Major Keller is currently the assistant chief evaluator (US), Joint Attack Helicopter Instrumental Evaluation Group, 1st Armored Division.

How Would You Do It?

US ARMY ARMOR SCHOOL PRESENTATION

SITUATION:

Your squadron has been experiencing many difficulties in the field with thrown tracks and erratic steering on numerous armored vehicles.

PROBLEM:

As the materiel readiness officer within the squadron, you have investigated this problem thoroughly and have found the following:

1. The track adjusters are all functioning properly.

2. The drivers of the vehicles have been trained adequately on proper driving techniques and on the conduct of operator maintenance.

3. All items in the suspension system are serviceable including the track itself.

4. The individual vehicles lack proper tools in the common tool bag to actually check track tension properly in accordance with the operator's manual.

Realizing that the only tool available for the measurement of track tension at the unit level is the 6-inch machinist ruler located in the general mechanic tool box, you have decided to design a gage to be used by the operators for checking track tension.

In designing your tool, keep in mind the following:

1. It should apply to all of your assigned track vehicles.

2. It should be small enough to fit in the tool bag or to be carried in the pocket.

3. It should be easily understood by not only the commander but the crew member as well.

4. It should be made of a material that will not deteriorate rapidly.

5. What instructions or measurements, if any, should be on the tool?

As you can tell by this article, we in Armor have a problem in the area of maintenance and it is most important that we have the proper tools to perform our job. Your suggestions or ideas are welcome and can be addressed to the author in care of the Automotive Department of the US Army Armor School.

AUTHOR: CPT JOHN R. CUSHING

ILLUSTRATOR: JO ANNE WHITLEY

HOW WOULD YOU DO IT? (CONT'D)

EXAMPLE:

1. Description. Four inches long, octagonal shape, aluminum, ⅜ inch wide with clip to be carried in pocket or in vehicle tool bag, pencil size, approximately 1 ounce in weight. Each side of the gage has inscriptions pertaining to a different vehicle.

2. Application. Gage is designed to measure the maximum allowable track tension according to the appropriate vehicle technical manual, and is used in conjunction with the operator's manual. This gage can be used in measuring track tension on the following vehicles:

a. M551	f. M107/M110	k. M125
b. M60/M60A1	g. M88	l. M132
c. M114	h. M113	m. XM741
d. M578	i. M577	n. M728
e. M108/M109	j. M106	o. M60 (AVLB)

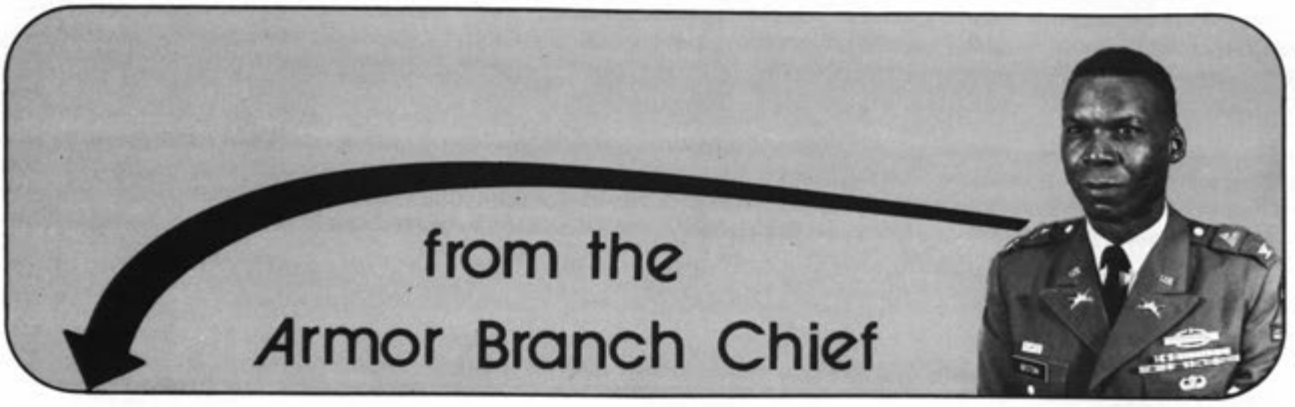
3. Procedure.

a. Determine the vehicle to be inspected.

b. Choose the appropriate side of the gage.

c. Turn to track tension in the listed technical manual.

d. Move your finger to the indentation at the opposite end of TM listing. The distance from the indentation to the end of the gage is the maximum allowable track tension on that vehicle.



Assignment Outlooks

A number of officers have been calling six months or earlier prior to their DEROS requesting specific information on their anticipated CONUS assignments. In most cases, their requests could not be satisfied. CONUS requirements are received on a bimonthly basis approximately four to five months ahead of an officer's DEROS. For example, if your DEROS is June or July, you will be assigned during March to arrive on station in July or August. This should be considered prior to contacting your respective assignment officer to obtain your next assignment.

As a result of current changes in our world-wide personnel picture, some difficulty has been experienced in making accurate predictions of short tour requirements. It is anticipated that notifications for assignment to short tour areas may come as late as four months prior to the in-country date. This particularly pertains to officers in the rank of major. All possible efforts are being made to minimize these occurrences and to provide maximum lead time for alerts.

The assignment outlook for company grade officers is considerably brighter than it has been during the past few years. The great decrease in our short tour requirements has all but eliminated involuntary second short tours for non-rated company grade officers. Any non-rated company grade officer who has returned from a short tour area since July 1969 is not, at this time, considered vulnerable for a short tour. As with our field grade officers, all tours are increasing in length. Officers can expect to serve a 36-month tour if assigned to Germany, and in many cases, a 30 to 36-month tour in CONUS. In addition, most company grade officers assigned to ROTC duty will find they are on a three-year tour.

In essence, Branch is making every effort to reduce personnel turbulence and increase stability. Stability of company grade officers will be further increased as we return to our pre-Vietnam policy of conducting only one Armor Officer Advanced Course per year. A proposal to shift to this policy in FY73 is currently undergoing detailed study at CONARC.

Battalion command tours are handled as a special assignment action. If you are a lieutenant colonel and are otherwise qualified for a command assignment, you are now being programmed for either a command or command equivalent position depending upon your relative standing among contemporaries, availability of commands and your personal preferences. If you desire specific information, you may call OX 3-1475/3-0690.

Aviation Assignments

Over the past several years, aviation assignments have been extremely turbulent. With the troop reduction in Vietnam, the turbulence will be greatly reduced.

Short tour requirements for aviators are at the lowest level in several years. All requirements are now being filled with aviators coming out of flight school who have never been on a short tour, plus a few second tour volunteers who go against requirements calling for experienced aviators.

All this means more stabilized tours for aviators. You can expect to remain at your present post for a full three-year tour, with a few exceptions.

One of the exceptions, of course, is for officers selected for further schooling who are reassigned to a school short of a full tour. Another would be our requirement to move an officer to a higher priority assignment if he possesses some particular qualification or skill required for the higher position. This would occur only if the requirement can not be filled by an officer who is already on the move such as an overseas returnee.

Those of you who received a commission directly from warrant officer status and have not yet attended the Armor Officer Basic Course (AOB) will be programmed to enter schooling prior to the end of FY72. Many of you have already been alerted to attend AOB enroute to a new assignment. Most of you are on one of the aviation training bases and will be moved to non-aviation type assignments. If you haven't sent us a preference statement recently—do it now, and be sure to include your duty phone number.

One of the most common questions asked of Branch is "What can I do to enhance my career or improve my position among my contemporaries?" The answer, of course, is for you to seek out the most responsible job available and strive for outstanding performance in whatever job you have.

Medical Standards For Army Aviation Training

There has been a change in medical standards for commissioned officer entry into Army aviation flight training. Per DA Message 161245Z February 1972, the medical standards for entry into flight training are expanded to permit the ROTC cadet, USMA cadet and commissioned officer to qualify for initial flight training if he meets Class 1A medical standards. The physical examinations of those applicants who were disqualified for either defective visual acuity or excessive refractive error should be referred to The Surgeon General's Office, through OPD-AA, for re-consideration under Class 1A standards.

Changes to Bootstrap

The Degree Completion Program "Bootstrap," as outlined in AR 621-5, has undergone two recent changes. First is that Regular Army commissioned officers participating in the program must complete degree requirements prior to attaining 20 years APLS. The requirement is changed from 23 years APLS. The second is an expansion of the 12-month limit in full-time college work to 18 months. This is in consonance with a new DA policy which emphasizes the importance of education in the Army. The revised education goal for officers is that all career officers will have a baccalaureate degree, and 20 per cent will have graduate degrees.

The specific facts are, "Commissioned officers will be authorized up to 18 months for completion of a baccalaureate degree. Priority will go to officers who can complete degree requirements in the least amount of time. Up to 18 months will be authorized for completion of an advanced degree in a discipline for which the officer's career branch has a requirement validated by the Army Educational Requirements Board. Officers obtaining advanced degrees under the later provision will be subject to an immediate utilization assignment after their schooling."

There is no change to officers who go for 12 months or less for their graduate degree. A utilization tour is still not required. The above does not pertain to the ROTC Instructor Training Program which permits up to two years under the Degree Completion Program with a follow-on ROTC utilization tour.

Officer Record Briefs Soon to Replace Career Branch Copies of DA Form 66 at DA

Since April 1957, Headquarters, Department of the Army has maintained an automated file of personnel records on commissioned and warrant officers in the Army. This file was used primarily to prepare various strength reports and a limited number of personnel management reports.

In May 1969, an automated Officer Record Brief was introduced containing information extracted from the Officer Master File maintained at DA. This brief was designed to reflect personnel management type data similar to that maintained on the Officer Qualification Record, DA Form 66 and will soon replace the career

branch copy of DA Form 66 as the source document for information concerning assignments and personnel actions in career branches. It is also being considered as a replacement for the DA Form 66 copy now provided to the DA Selection Boards.

Prior to implementation of the Officer Record Brief as a personnel management tool, an all-out effort will be made to insure that individual records on the Officer Master File reflect the highest possible degree of data accuracy. A data audit will be conducted by sending copies of the Officer Record Brief for review by the individual officer and corrective action through the unit personnel officer. Announcement of the audit was made in DA Message 312105Z Jan 1972, subject: Audit of HQ DA Automated Officer Record Brief (ORB). Detailed procedures will be provided personnel officers for the audit and for initiating corrective action.

The audit will be conducted in two phases. Phase I will be conducted as shown in the following schedule:

Month of Audit	Records to be Audited by Grade
March 1972	CW2 and 1LT (RA and OTRA/VOL) and all officers, all grades thru COL of JA and CH Corps
April 1972	CW3 and CPT (50%)
May 1972	CW4 and CPT (50%)
June 1972	MAJ (all)
July 1972	LTC and COL (all)

Those excluded from the audit are: second lieutenants, warrant officers (WO1), and first lieutenants and chief warrant officers (CW2) (OTRA/OBV); officers scheduled for separation within six months of the audit month; officers scheduled for return from overseas in the month of audit; officers in a transient or patient status; and officers assigned to student detachments at Army headquarters.

Phase II of the audit will start in October 1972. It will include the audit of record briefs of officers who were: in a patient or transient status; scheduled for return from overseas within the month of the audit in Phase I; and those included in Phase I for whom an audited record brief was not received in HQ DA. The record briefs will be prepared automatically; therefore, requests for copies of the record brief should not be made. If, after Phase II is completed (December 1972) you have not received a copy of your record brief for audit, you should request a copy from your career branch.

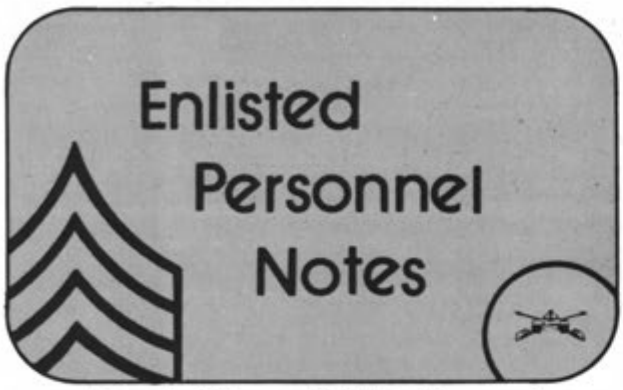
After the initial audit, tentative plans call for an annual audit of the record brief by the individual officer similar to the audit now performed on DA Form 66.

Eligibility For Temporary Promotion To 1Lt and CW2

Effective 1 April 1972, the service eligibility for promotion to first lieutenant and chief warrant officer (CW2), AUS, will be gradually extended. Second lieutenants and warrant officers (CW1) who have demonstrated that they are fully qualified will attain eligibility for temporary promotion to first lieutenant and chief warrant officer (CW2) in accordance with the following schedule:

Officers with dates of entry on Active Duty as a 2LT or a WO1 as shown below:	Attain eligibility for promotion to 1LT and CW2 on dates shown below:	Which is the day following completion of Active Duty service as a commissioned or warrant officer as shown below:
1–15 April 71	1–15 April 72	12 months
16–30 April 71	16–30 May 72	13 months
1–15 May 71	1–15 July 72	14 months
16–31 May 71	16–31 August 72	15 months
1–15 June 71	1–15 October 72	16 months
16–30 June 72	16–30 November 72	17 months
1July 71 and later	1 January 73 and later	18 months

The extension of time in grade is consistent with other phasedown policies and will result in a better balance in company grade and warrant officer assets.



From the Director of Enlisted Personnel

PREPARATION FOR MOS EVALUATION

MOS Evaluation Tests and Enlisted Efficiency Reports (EER) now have greater impact than ever before on the military career of the soldier. These personnel management tools are used under the Army's Enlisted Evaluation System (EES) to assess the soldier's knowledge of military and technical requirements of his MOS and his performance in whatever job he is employed.

Performance on the job is basically indicated by the EER; that is, the EER reflects how well the soldier does on his job, and what his potential is viewed to be by two of his direct-line supervisors—his rater and reviewer.

What the soldier can do and what his potential may be in his MOS are indicated basically through the soldier's own self-appraisal when he answers the questions on his MOS test.

It is the inherent responsibility of any supervisor/rater to observe his subordinate's job performance and personal actions, and frequently discuss these factors with him during periodic counseling sessions. When this responsibility is properly fulfilled, the ratings and remarks on the EER should come as no surprise to the rated soldier—he should be fully aware well in advance of the EER as to how he measures up in his boss's eyes. If he isn't cutting it, he also should know this long before the EER is due. Thus, he can either mend his ways, seek a transfer, or let the inevitable "less than desired" rating occur. Of course, if he is satisfied, so be it!

TIME TO PREPARE

Getting ready for the MOS test is another matter, however. A basic premise of the EES is that each soldier eligible for MOS evaluation should be afforded, when possible, ample opportunity to prepare himself for testing.

The concept of a 90-day pre-test preparation period, although not appearing in governing regulations, has prevailed as an administrative objective since the EES commenced operation in January 1959. However, failure to have a formal three-month pre-test preparation period does not constitute sufficient basis for delaying testing of eligible individuals, since an individual is presumed to possess, as a minimum, the basic skills and knowledge required for that MOS.

In fact, regulations governing the enlisted classification system, place responsibility on the classification authority to award and/or designate MOS as primary and secondary based on the individual being qualified in the particular MOS. Basic classification policy and regulations are violated when an individual is awarded an MOS in which he is not qualified. Moreover, award of MOS to individuals who are not qualified for the award may incur other legal implications in terms of erroneous receipt of proficiency pay or variable reenlistment bonus payments.

Another basic premise of the EES is that the soldier is responsible for maintaining proficiency in his MOS (reference: paragraph 5-6d, AR 600-200). It is the individual's responsibility to seek out and study applicable material. It is the commander's responsibility to schedule and conduct orientation on the objectives and impact of the evaluation, the soldier's responsibilities to prepare and report for testing, and to establish and promote training and study programs (reference: paragraph 5-6c(3), AR 600-200).

Both the commander and the soldier may exploit the facilities of the education center, whose director is charged by regulations (AR 621-5) with maintaining reference libraries and conducting MOS classes and supervised study groups.

MOS TEST PERIODS

MOS are stabilized to the extent possible by annual test period. MOS to be tested during a calendar year quarter, and specific instructions to accomplish this, are published and distributed to unit level at least five months prior to the principal testing month. Regulations provide that the unit personnel officer identify personnel eligible for testing, and notify the test control officer (TCO) accordingly. The TCO obtains a study guide for each soldier and makes it available through his personnel officer to the unit commander for distribution to the soldier as noted above.

The US Army Enlisted Evaluation Center, Ft. Benjamin Harrison, Indiana, has established an objective of providing MOS study guides to the field to permit distribution to the soldier at least 90 days before he is tested. The "Study Guide for Maintaining MOS Proficiency" contains information concerning the EES, titles of nonresident courses pertaining to the MOS, and a listing of study reference material available through normal publication channels from which the test questions are developed.

Procurement of study references in sufficient quantity to serve the needs of all eligible personnel within particular MOS, including those personnel at isolated locations, is a command responsibility. The soldier and his commander may also review the MOS specification in AR 611-201 or 611-202, as appropriate, and other related material maintained by the personnel office and/or AG section.

MOS tests are built around the entire MOS code; that is, questions are developed to sample the entire range of skills and knowledge required to perform duty in the

MOS, as reflected in AR 611-201 or AR 611-202. This is necessary particularly to serve the needs of the assignment system, which provides that a soldier is vulnerable for assignment to a duty position in his MOS anywhere in the Army without regard to the specific duties or equipment on which he is currently employed. The MOS tests and study guides are developed as a close collaborative effort between the test psychologists at the Army Enlisted Evaluation Center and the subject matter experts at the MOS-producing school or other item-writing agency.

In summary, the soldier who is properly classified must be presumed to be at least minimally qualified in his MOS. He has an inherent responsibility to maintain proficiency in that MOS; or else, the MOS should be withdrawn and the soldier reclassified into an MOS in which he is qualified.

PHYSICAL PROFILE AND YOU

The Army is experiencing a continuous problem with junior and senior enlisted personnel who have assignment limitations.

Actually, the problem is two-fold and deals with a small group of soldiers whose own personal actions, rather than the profile system or reclassification procedures presently employed by DA, are causing large problems throughout the Army.

First, let's look at the devoted soldier who does everything possible to keep his physical limitations unknown and performs well in his present assignment. His actions may seem commendable until the dilemma arises when he finally lets his problem be known. At this time he stops, thinks and accepts reality; he is not physically fit to perform his Primary Military Occupational Speciality (PMOS) in a combat situation. Only then does he report his physical limitations and is deleted from the assignment.

What happens? It leaves the gaining unit with a vacant slot while action is being taken to get it filled again.

Another and even more troublesome situation occurs when the NCO does not reveal his limitations until after arrival at his new assignment. The gaining unit gets a man on schedule but still does not have anyone to accomplish the mission.

The second major problem area develops when the man is physically fit to perform in his PMOS but uses—or tries to use—his profile for personal gain. This can best be seen in a request for deletion from oversea assignment and appeal for reclassification to a new PMOS—even though physically qualified.

DA, however, has taken action to alleviate this problem. Personnel with a permanent 3 in their profile are now required to appear before a reclassification board. It is not desired to reclassify all personnel with a 3 but only to identify and take timely action on those not physically qualified in their PMOS.

POR PROCESSING—WHAT IS IT?

So you've received orders for overseas. Maybe you're happy with the orders, or perhaps you wish that you did not have to make that long trip away from home. However, as you well know, there is a requirement in your grade and MOS in the oversea command, and you're the most eligible for the assignment.

Naturally, questions fill your mind. If you're married, you're probably wondering about the family. "Will they be able to make the trip with me or will they have to stay in the US and possibly join me later?" "What about my car?"

But equally important to you as an individual is your POR (Preparation of Individual Replacements for Oversea Movement) processing.

You no doubt have heard the remark, "Are you POR qualified?" The purpose of this article is to give you a quick summary of what POR entails. Your commander and personnel officer can provide you all the specific details in your particular case, but at least you won't be completely in the dark about some of the requirements when you begin the initial processing.

The POR details are all contained in AR 612-2(Preparing Individual Replacements for Overseas Movement and US Army Oversea Replacement Station Processing Procedures).

POR processing is required for all members of the Army preparing for oversea movement (even if from one oversea area to another) with the exception of general officers. AR 612-2 is a detailed set of instructions which insures that you have all the required records, medical examinations and innoculations, clothing, and most importantly—that you are qualified for oversea assignment.

Assignment instructions for oversea movements are issued from DA. However, DA is not infallible and perhaps there is some factor that is unknown by DA, but known by your local command, which makes you ineligible for oversea movement.

That's why POR processing itself is rather painless. It is normally included in the outprocessing from your unit and in many cases only requires a review of your records.

After gathering all your records in a central location, making the necessary closeout entries and checking to insure that you have all the required items, you are on your way—POR qualified.

However, in some instances, you might not have kept up on your innoculations, lost your dog tags or possibly your dependents ID card has expired. In these instances necessary corrections are made, the items issued, and then you're back on the right track—POR qualified.

In addition, to aid both you and your personnel officer and commander, a checklist, DA Form 613 (Checklist for Preparation of Replacements for Oversea Movements), has been prepared which will insure that you are POR qualified. When you receive your orders, or even better yet, when you are initially notified, take a look at this checklist which you can obtain from your orderly room or personnel office.

Oversea movement is naturally a period of turmoil and confusion. Don't make it harder on yourself or your family by arriving at your new duty station without all your affairs in order. Be POR qualified when you leave your old unit—and make your oversea tour an enjoyable one.

news notes

RUTH SHERIDAN NAMED ARMY WIFE OF THE YEAR

Mrs. Ruth P. Sheridan of Selfridge, Michigan, was recently selected the 1972 Army Wife of the Year. The Army Materiel Command entry was among 14 finalists chosen from 22,000 candidates.

Mrs. Sheridan will represent the Army in world-wide

Mrs. Ruth P. Sheridan

competition for the coveted title of Military Wife of the Year, which will be held in Washington, D.C., during the week of 16 May.

Her husband is Colonel Stan Sheridan, project manager of the *M60* Main Battle Tank in Warren, Michigan.

FIRST US ARMY NCO ACADEMY STREAMLINES INSTRUCTION

Due to the recent reorganization of NCO academies throughout CONUS, the First US Army NCO Academy at Fort Knox recently implemented a new four-week program of instruction.

This program emphasizes a garrison type environment. Major areas are military leadership, effective military instruction, drill and ceremonies, physical training and selected general subjects. The course will be conducted eight times per year.

In order to qualify for the Noncommissioned Officer Academy Course, personnel must be in grade E5 or E6; be qualified in their MOS; a high school graduate or the equivalent, or possess an aptitude GT score of at least 100; a character and efficiency rating of excellent; a physical profile of 1 or 2; and at least 12 months service remaining after graduation.

Commanders may waive certain attendance prerequisites. Waivers may be granted for those personnel in grade E7; personnel with more than nine months remaining after graduation based on ETS or if the unit commander feels that the individual will reenlist; a person with a physical profile of 3 but is able to complete all phases of training; and personnel with a GT score of 90. An outstanding E4 may attend the course if he has completed 18 months service and is assigned to a leadership or supervisory position in his unit. However, all efforts must have been made to send all eligible E5s and E6s prior to submitting an E4.

The students (approximately 44 per class) will be required to live at the academy for the first two weeks of the course. During the evenings of the live-in period, students will be afforded the opportunity to participate in supervised seminars and group study sessions.

To graduate, students must achieve a minimum of 70 per cent in three major areas: leadership, effective military instruction and the commander's evaluation; in addition, they must achieve an overall course average of 70 per cent.

Graduates of the course will be trained as small unit leaders, capable of handling garrison type situations in a professional manner. These graduates will not only improve themselves, but they will also be awarded 30 promotion points upon successful completion of the course.

ARMORED SCOUT PROPOSAL

This is an artist's conception of Ford Motor Company's proposal for an armored reconnaissance scout vehicle. The vehicle is amphibious, capable of more than 60mph on highways, and uses lug-type wheels mounted inboard of rubber tires. Industry proposals are now being reviewed and competing designs are expected to be selected this summer for competition.

YOUR REPRESENTATIVE AT THE ARMOR AGENCY

Sergeant Major William S. Parker is assigned to the US Army Combat Developments Command, Armor Agency at Fort Knox, Kentucky. His duties are to work closely with the action officers of the agency in the development of doctrine and organization, and in the design of armor vehicles. More specifically, he is consulted as a user representative on matters pertaining to human engineering, i.e., how well can the user be expected to shoot, move, communicate, and live with an item of equipment.

The sergeant major will readily admit that he doesn't have all the answers. With this in mind, he, along with the agency commander and project officers, has invited noncommissioned officers from the Armor Community to participate in working symposiums to discuss improvement of existing vehicles and development of new vehicles.

The agency is the Armor Community's user representative for developmental matters of doctrine, organization and materiel. Sergeant Major Parker is the enlisted man's point of contact in these matters. Anyone who has a problem with a piece of equipment, a suggested change, or just wants to get involved can contact him at:

AFAA
USACDC Armor Agency
Fort Knox, Kentucky 40121

ORIENTEERING—ARMOR STYLE

How do you test a student's navigational skill, physical stamina, decision-making ability and academic recall? Your test must be demanding and comprehensive, yet fair. What do you do? Here's what the Armor School is doing in its new "Armor Military Stakes—Orienteering." Check out these measures of the man:

- Shooting for a 3-hour goal (4-1/2 hour maximum), the student must complete ten requirements ranging from offensive and defensive tactics to leadership reaction, with stops along the way for automotives, communications and weaponry tests.
- A test of navigational ability is built in through employing the orienteering concept. The requirements are located at stations hidden over a wide expanse of terrain.
- Obstacles throughout the course force the student to make the decisions as to the best route from one station to another, then he must keep moving—running in fact—as his mental and physical stamina are evaluated concurrently. Students must run from five to seven miles in traversing the course.

Beginning with AOB 8-72, all AOB students will compete in this new Military Stakes. Future NCOB students will also compete in this course; and an orienteering requirement is being considered for incorporation in the relatively new Advanced Course Officer Comprehensive Evaluation.

the tarpaulin

Covers a bit of everything gleaned from the service press, information releases, etc. Contributions are earnestly sought.

TAKE COMMAND

LTG Welborn G. Dolvin, IX Corps, USARJ . . . **COL Theodore J. Charney,** 3d BCT Bde, Ft Dix . . . **COL William H. Harper,** Marksmanship Training Unit, Ft Benning . . . **COL Edward M. Markham III,** 1st Bde, 4th Inf Div . . . **COL Lewis B. Martin,** 2d Bde, USATCA . . . **COL William G. Walby,** 4th CST Bde, USATC-Inf, Ft Ord . . . **LTC (P) Floyd C. Adams Jr,** Arty, DIVARTY, 3d Armd Div . . . **LTC Robert F. Anthis,** 15th Bn, 4th Bde, USATCA . . . **LTC William E. Beatty,** 4th Sqdn, 9th Cav, 1st Cav Div . . . **LTC William R. Blakely Jr,** 1st Bn, 64th Armor, 3d Inf Div . . . **LTC Harry A. Heath,** 1st Bn, 37th Armor, 1st Armd Div . . . **LTC James D. Johnson,** 2d Bn, 66th Armor, 2d Armd Div . . . **LTC Lawrence Lipscomb,** 3d Sqdn, 3d Armd Cav Regt . . . **LTC Thomas J. LeVasseur,** 12th Bn, 5th Bde, USATCA . . . **LTC Gunther G. Oberst,** Arty, 1st Bn, 94th Arty, 1st Armd Div . . . **LTC Roger L. Schenck,** Inf, 2d Bn, 46th Inf, 1st Armd Div . . . **LTC Arthur R. Stebbins,** 2d Bn, 1st Bde, USTACA . . . **LTC Donald L. Summers,** 3d Sqdn, 163d Armd Cav Regt . . . **LTC Robert A. Wolfe,** 4th Bn, 68th Armor, 82d Abn Div . . . **LTC Billy J. Wright,** 4th Bn, 35th Armor, 1st Armd Div . . . **MAJ Kenneth E. Rubin,** D Trp, 1st Sqdn, 4th Cav, 1st Inf Div.

ASSIGNED

BG Hugh J. Bartley, Comptroller, HQ USAREUR . . . **BG Rolland V. Heiser,** DCG, Ft Lewis . . . **BG John W. Vessey Jr,** Dep Chief, JUSMAGTHAI . . . **COL E. F. Astarita,** HQ CINCPAC (J8) . . . **COL Raymond H. Beaty,** DPCA, Ft Knox . . . **COL John P. Berres,** Armor and Engineer Board, Ft Knox . . . **COL Ernest J. Davis,** DCSPER, HQ 1st Army . . . **COL George H. Hallanan Jr,** IO, HQ CDC . . . **COL Robert B. Hankins,** Arty, V Corps Arty . . . **COL Raimon W. Lehman,** SC, G4, V Corps . . . **COL Carl B. Lind,** HQ CDC . . . **COL Thomas G. Quinn,** Royal College of Defense Studies, London . . . **COL Ace L. Waters Jr,** Sr Army Adv to Tex NG, Austin . . . **LTC Andrew H. Anderson,** DCSOPS, HQ USAREUR & 7th Army . . . **LTC Dennis M. Boyle,** G3, V Corps . . . **LTC Clayton J. Bachman Jr,** MACV . . . **LTC Stephen G. Beardsley Jr,** Chief, Doctrine Div, DDLP, USAARMS . . . **LTC Joe A. Brown,** USAARMS . . . **LTC William D. Carter,** HQ MACV (IG) . . . **LTC Gene E. Clark,** CINCPAC . . . **LTC Ronald G. Clarke,** Ft Knox . . . **LTC Thomas F. Cole,** HQ VII Corps . . . **LTC Donald D. Davis,** GI, III Corps . . . **LTC Dan L. Drury,** HQ USEUCOM (J3 Opn Ctr) . . . **LTC Gaillard A. Freimark,**

MACV . . . **LTC Calvin Hosmer III,** HQ 2d Armd Cav Regt . . . **LTC Thomas W. Kelly,** G3, 1st Inf Div . . . **LTC Donald T. Kemp,** HQ V Corps . . . **LTC (P) Robert E. Ley,** PSA, Quang Tin Province, MACV . . . **LTC Ralph L. Lehman Jr,** Armor Agency, CDC, Ft Knox . . . **LTC Hollis Messer,** MACV . . . **LTC Arthur J. Palmer,** HQ USA SPT THAI . . . **LTC Ralph J. Powell,** HQ USAG, Ft Richardson, Ak . . . **LTC Carl G. Smith,** 2d Bde, 2d Armd Div . . . **LTC Howard C. Walters Jr,** HQ USEUCOM (J5) . . . **LTC A. T. Wilson,** ACSFOR, HQ DA . . . **MAJ William F. Balfanz,** 3d Bde, 3d Armd Div . . . **MAJ Edwin Dumas,** Tm 2, MACV . . . **MAJ David A. Neck,** USMACTHAI . . . **MAJ James V. Wasson,** S3, 14th Armd Cav Regt . . . **MAJ Daniel H. Wilson,** 1st Sqdn, 17th Cav, 82d Abn Div . . . **MAJ Everett S. McCossey,** ROTC Gp, Providence College . . . **MAJ Barry Winzler,** IO, 1st Cav Div . . . **CSM Arthur E. Carver,** White Sands Missile Range . . . **CSM A. E. Orr,** Ft Knox.

VICTORIOUS

The dining facility of **HHT/ACT, 3rd Armd Cav Regt** has won the 6th Army nomination for the Phillip A. Connelly Award for Excellence in Army Food Service for FY 72 . . . **Sally Mills Good** of Ft Leavenworth has been named 5th Army Wife of the Year . . . **Ft Hood** won the 5th Army basketball championship . . . Distinguished Graduate of AOB 7-72 was **2LT James S. Moss;** Honor Graduates were: **2LT Robert L. Tweddle, 2LT Stephen L. Nourse, CPT Jerry L. Higgins, 1LT Norbert J. Schenkel** and **2LT Dana E. Hobson Jr** . . . Distinguished Graduate of AOB 8-72 was **1LT James N. Germany;** Honor Graduates were: **2LT Robert W. Sherry, 2LT William C. Callaway, 2LT Stephen J. Clavere** and **2LT Jan H. Harpole** . . . Distinguished Graduate of Motor Officer Course Number 7 was **CPT Wesley M. Scoates;** Honor Graduates were: **CPT James W. Dixson, 2LT Edwin D. Thompson** and **2LT Robert W. McElwain** . . . Distinguished Graduate of Motor Officer Course Number Eight was **2LT William C. Townsend Jr;** Honor Graduates were: **1LT Thomas A. Dunn, 1LT Alex Soataru** and **CPT Jesse L. Keeton** . . . The Honor Graduate of NCO Academy Class 72-4 was **SSG Daniel W. Chapman;** Distinguished Graduates, were: **SP5 Stephen R. Morgan, SSG Ralph K. Gibbs** and **SSG Gilbert M. Watanabe** . . . Lieutenant of the Year winners: **1Lt Dennis F. Morgan,** Carlisle Barracks; **1LT Edward G. Pasierb,** Ft Dix; **1LT Frederick C. Schattauer Jr,** Ft Knox . . . The Distinguished Graduate of the C&GSC Associate Course was Army Guardsman, **LTC Charles H. Kone** of LaPryor, Texas.

AND SO FORTH

A task force of some 200 troopers from the **3rd Armd Cav Regt** has joined the search for "D.B. Cooper," who parachuted from a hijacked plane last November. The cavalry force, commanded by **LTC Edward H. Bonsall,** combined the search with adventure training after the FBI asked the Defense Department for assistance . . . **John K. Owens Jr.** is manager of the Armor School Branch, Ft Knox National Bank . . . The largest military joint training exercise since 1965 took place recently when 23,000 men were deployed from all across the nation to Ft Hood. Called **Gallant Hand 72,** the exercise was under the control of the recently established **Readiness Command** . . . The newly formed ARVN **3d Inf Div** has received a squadron of M48 tanks . . . Bell Helicopter Company has received a contract as prime systems integrator on the Improved Cobra Armament Program (ICAP). Under terms of the contract, a total of eight TOW antitank missile systems will be integrated into midified AHIG HueyCobra helicopters . . . The **9th Inf Div** was recently activated at Ft Lewis . . . **Senator John Tower** (R-Tex has introduced legislation to award a **"Prisoner of War Medal"** to members of the Armed Services who have been captured in combat and held prisoner at any time since 1 Jan 60 . . . The **112th Cavalry Regiment** will hold their annual reunion 12-13 Aug at SPJST Lodge Number 82 in Dallas . . . **Idaho ARNG tankers** recently used a *M88* tank recovery vehicle to recover a commercial 727 jetliner that got stuck in mud and snow after slipping off the Boise Airport runway during a blizzard . . . **A. Robert Moore** has been elected president of the 1st Armd Div Assn . . . The new assistant adjutant general of the state of Kentucky is **BG William E. Hall . . . The 10th Armd Div Assn** has established a west coast chapter; contact Bernie Connolly, 6554 Altair Ct, San Diego . . . Former USAARMS instructor, **ACE Edmiston,** has been named the new Education Advisor for the US Army Finance School . . . **COL Phan Hoa Hiep** has assumed command of the ARVN 2d Inf Div. Another ARVN Armor officer, **COL Ly Tong Ba,** has assumed command of the 23d Inf Div. It is significant to note that one of the four corps commanders and three of the eleven division commanders wear the black beret . . . **4th Sqdn, 9th Cav** has been activated with **LTC Bill Beatty** as CO . . . **COL C. Robert Kemble,** of USMA's English Dept, has been appointed president of the New Mexico Military Institute . . . **Billie D. Ark,** of the Ft Knox National Bank, has been appointed director of the US Senate Committee on Veterans' Affairs National Advisory Council . . . USMA **Cadet Stephen D. Presley,** first in the Order of Merit, picked Armor as his branch choice . . . the **1st Armd Div NCO Academy** has been moved to Ansbach . . . the **10th Avn Bn** has been reorganized at Ft Lewis, with **LTC James R. Massengill** as CO . . . **8th Sqdn, 1st Cav** provided men and helicopters for rescue efforts during the recent flooding in West Virginia.

from the bookshelf

THE TIME BOMB: A VETERAN JOURNALIST ASSESSESS TODAY'S CHINA FROM THE INSIDE.

by Norman Barrymaine. Taplinger. 214 pages. 1971. $6.50.

More than the story of one man's ordeal during his long imprisonment in Shanghai, *The Time Bomb* is a personal assessment of the changes wrought in China by the Cultural Revolution. The book is in three parts, the second of which is by far the most interesting as an account of the author's arrest in February 1968, subsequent interrogation, life in prison, and eventual release in October 1969.

Part one is a second-hand account of Cultural Revolutionary developments from 1960–65. Well digested and interpreted, it owes obvious debts to others, such as Neale Hunter, who provided greater detail in his 1969 *Shanghai Journal*. In spite of the derivative nature of these chapters, the author's insights make them worth reading.

In part three, Mr. Barrymaine adds to the main body of his book a two-chapter discussion on nuclear China and on China's expansionist trend throughout the world, but in particular vis-a-vis its northern neighbor, the Soviet Union. Beyond serving as an expression of the author's opinions and a coda to the book, these chapters are of marginal value; he would have been better advised to end with the subdued drama of his release at the Hong Kong border.

Against such negative impressions, however, must be weighed the fascination of the account in part two which makes up the bulk of this book. Stopping over in Shanghai on a Polish vessel en route from North Korea to Hong Kong, the author fell afoul of security officials. His long experience as a senior British foreign correspondent in Asia adds immeasurably to the acuity of his observations; it was not, however, sufficient to win his release, particularly since the Hong Kong Government at the time was holding 13 Chinese Communist journalists in detention.

In his late sixties and in poor health, he spent almost twenty months in prison. What Mr. Barrymaine has to say of those months is extremely revealing, both of Mao's China and of his own strength of character. It is an account well worth reading.

Perhaps the best summation is provided by the author's own words. When asked if he would still have set out on the journey which led him to Shanghai, knowing in advance its outcome, he replied thoughtfully that he would—that there were rewards to compensate for the pains: ". . . nearly twenty months in prison, living in intimate association with Mao's Chinese, was a unique experience. . . ."

Colonel John E. Coon
USAWC

A NEW US POLICY TOWARD CHINA

by A. Doak Barnett. The Brookings Institution. 132 pages. 1971. $5.95.

The rate of change in Sino-American relations since mid-1971 has been greater than the author could possibly have anticipated. Many of his proposals are already well on the road to actuality. Since this book's publication in June, have come President Nixon's July announcement of his proposed visit to Peking, the September evidences of turmoil in Communist Chinese leadership, and the November UN vote on China membership. In spite of this spate of events, however, Doctor Barnett's study remains of distinct value.

Chapter Three, "Assumptions about China," and Chapter Four, "The Asian Context," are particularly incisive. In the former, the author assesses those enduring domestic factors which will influence Peking's foreign policy for the foreseeable future; and in the latter, he treats the new "four-power balance" between the US, Japan, China and the Soviet Union, which will work toward relative stability in East Asia during the years immediately ahead.

The remainder of the book deals with specific policy options open to us and with several problem areas—most noteworthy the Taiwan question and the issue of nuclear power.

The book, a careful and sound analysis, is of definite interest to any reader concerned with past, present and future relations between the United States and the People's Republic of China. Doctor Barnett's long study of China, including his teaching at Columbia University and research with the Brookings Institution, has resulted in numerous valuable publications. The fact that the present work has been partly overtaken by events does not negate its current pertinence.

Colonel John E. Coon
USAWC

ZHUKOV

by Otto Preston Chaney Jr. University of Oklahoma Press. 441 pages. 1971. $9.95.

Khrushchev once described Zhukov as "blunt, bold, direct and nondiplomatic—as a soldier should be." It was an apt description of the Soviet Union's greatest military leader of this century.

The author, Colonel Chaney, is a graduate of the Army's prestigious four-year Russian area and language study program. He holds a Ph.D. in Russian studies and has served as a US liaison officer with the Soviet forces in East Germany and in the Defense Intelligence Agency. He is well qualified to write Zhukov's biography.

Zhukov was a ruthless, demanding commander who drove his men to any excess in order to achieve victory. Zhukov's first test as a major commander is well described in this book. In the 1939 battle against the Japanese in Mongolia, Zhukov showed himself to be bold, innovative and able. Biding his time in order to build a superior force in men and firepower, he crushed the Japanese, inflicting 55,000 casualties on their best Kwangtung forces.

Zhukov's wartime exploits against Hitler's forces are given in detail. Here Chaney has leaned heavily on Soviet sources and gives the campaigns from the Russian point of view. Some of his Western sources, Alexander Werth for example, have a decided pro-Russian bias. Nevertheless, Chaney's account is interesting and informative, although decidedly one-sided.

The primary value of the book is in Chaney's coverage of the battle of

Khalkin Gol in 1939, and in his well-done description of Zhukov's postwar career when he was repeatedly in and out of favor with the Soviet political rulers. Zhukov's personal vendetta with his military colleagues, Konev and Chuikov, and his role in placing Khrushchev in power are most interesting. For his assistance to Khrushchev, Zhukov became Minister of Defense and was the only military man to ever become a member of the Party's Politburo.

But Zhukov, although a good Party man, did not believe in Party domination and direction of purely military affairs. Accordingly, he reduced the power of the Main Political Directorate within the military forces and sought to restrain the influence and use of political officers in units below regimental level. This brought about his downfall in 1957. He had previously been downgraded and virtually exiled by Stalin, prior to Khrushchev rehabilitating him. After his second removal from power, Zhukov remained in seclusion until 1967 when he again emerged as the only man besides Lenin who in recent decades fully captured the minds and hearts of the Russian people.

While in exile, Zhukov wrote his autobiography on which Chaney has drawn heavily. However, Chaney's book is far more objective and complete as the autobiography by Zhukov covered the period only up to 1945.

Colonel Charles W. Stockell
USAWC

FIVE YEARS TO FREEDOM.

by Major James N. Rowe. Crown. 467 pages. 1971. $7.95.

In the wake of missing man aerial flyovers, the Son Tay raid, and innumerable private and political efforts to obtain the release of American prisoners-of-war held captive in Southeast Asia, it remains, nevertheless, that Americans have generally little concrete knowledge about the conditions and circumstances of the more than 1,500 American servicemen currently in captivity.

And so it is, to me, doubly tragic that the American reading public has, by and large, overlooked the remarkable journal of Army Major James N. "Nick" Rowe who, as a Green Beret lieutenant, was captured by the Viet Cong in October 1963, and was held prisoner in South Vietnam's Mekong Delta region until his daring escape in December 1968 after more than 62 months in captivity. The story of this heroic young officer's magnificent ordeal is fully captured in his *Five Years To Freedom* and should be read and re-read by all Americans, particularly those who are interested in the lonely plight of the prisoner-of-war.

That Nick Rowe survived the continual onslaughts by the Viet Cong to destroy his mind and body, and was able to overcome the physical infirmities endemic to the minimum diet and unsanitary hygenic conditions of his surroundings is not only a tribute to Rowe's resilence and determination but, further, represents a stirring example of the unconquerable dignity of man in his darkest, but finest hour.

Well-trained and well-grounded in his beliefs, Rowe demonstrated time and time again the inability of his captors to defeat him either in his physical surroundings or in the ideological struggle for his mind. And so, in April 1965, Rowe refuses to denounce his actions or the United States position in Vietnam despite intensive political lectures and ideological discussions, assessing his refusal to cooperate "a combination . . . of pride, remaining sense of duty, and devotion to what I believed to be right. . ." Or, when he decided to celebrate Christmas 1967 (after 50 months a captive), he fashioned a wreath of tree branches and pieces of colored thread, sang Christmas carols, and shared his meager food ration with his guard. Or, later, with the promise of a release in May 1968 if he would write a letter to American troops in Vietnam, the indomitable Rowe refuses, drawing strength this time, as in many instances in the past, from the Code of Conduct which, Rowe states, "was the one thing I remembered as an unchanging guide. Even when the issues were totally confused, it provided the standard of conduct that should be maintained. . ."

Using any available scraps of paper as his writing tablet, sharpened reeds as his pen, and a variety of liquids (including blood) for ink, the author kept an extremely detailed diary of his entire captivity, and carried it with him to freedom (after two earlier unsuccessful escape attempts). This diary formed the framework for his recollections of the events and incidents which comprise this remarkable study of the POW experience. Through Rowe we meet, in intimate detail, his captors—Porky, Plato, Cheeta, Showboat, Mafia and a host of others, each accorded a nickname by the author, and through them we learn much of the working of the enemy mind.

This book grants the reader such an intimate glimpse of POW conditions, and the repeated reactions of one courageous individual to them, that military commanders everywhere might do well to incorporate Nick Rowe's story in their Code of Conduct training. There are many lessons to be drawn from this book, and military men should take advantage of it.

But whether you are interested in lessons learned, POW conditions, the enemy mental process, or simply learning more about mankind, I recommend that you take the time to read *Five Years To Freedom* and you will find, as I did, a book for all seasons.

Major John G. Fowler Jr.
University of Rhode Island

VIET CONG REPRESSION AND ITS IMPLICATIONS FOR THE FUTURE

by Stephen T. Hosmer. DC Heath and Co. 176 pages. $8.50.

Dr. Hosmer's book deals with an aspect of the Southeast Asian conflict which has been frequently alluded to and talked around by both dove and hawk—but never faced in a cold, objective manner. Assassinations, executions, forced labor, and other forms of repression have long been a major tactic of the Viet Cong to control dissident elements; yet, surprisingly, this is the first detailed inquiry into this topic to be made public. His revelations and conclusions will sober the most skeptical dove.

All aspects of repression are covered most adequately. Based upon extensive research into the tons of documents captured from the Viet Cong, the author has defined repression as the enemy defines it, then discusses how repression campaigns are planned and executed. Of particular significance is the lengthy discussion on what is considered a "crime" by the Vietnamese Communist Party. As Dr. Hosmer explains, "virtually any act harmful to their movement is a crime."

The book is thorough, articulate and based upon acts actually committed, rather than upon the speculation or moral philosophising which so permeates current literature. This might be the only criticism of the book, for his treatment of the topic may be too scholarly to capture the interest of the general public —exactly the people who most need to read it.

The Army officer will find the book to be a wealth of information to counter the arguments of those who feel the Viet Cong are nice people. Any reader

will find the book an essential one to round out his understanding of insurgent movements.

Major John B. Hubard
University of Kentucky

WIDER WAR: The Struggle for Cambodia, Thailand and Laos.

by Donald Kirk. Praeger Publishers. 305 pages. 1971. $10.00.

It is refreshing in these times to find anything written about Southeast Asia that is halfway objective, and that puts the agonies of that embattled region in some perspective.

"Wider War" is objective, and author Kirk sets the present dilemma of the war in Cambodia and Laos, as well as Vietnam, and the insurgency in Thailand in their correct setting—the perspective of overlapping regional and great power rivalries that grew out of the dissolution of French Indochina between 1945 and 1954. The ultimate dilemma of accomodation between the Communists and the struggling but divided nations of the area stands out in each country as the single problem incapable of solution without a wider war.

Essential reading for anyone who cares to try to understand the enormity of the political-social-economic-military challenge facing non-Communist nations in the still smoldering ruins of the French colonial empire.

Brigadier General Donn A. Starry
ACSFOR

GERMAN ARMY UNIFORMS AND INSIGNIA 1933-1945

by Brian L. Davis. World Publishing. 244 pages. 1972. $12.00.

This is an outstanding, exceptionally well-documented and illustrated history and reference book on the development of uniforms, insignia and accoutrements of the German Army during the Third Reich. The author is a well-recognized expert on the Wehrmacht.

Wisely, the author has concentrated entirely on the Wehrmacht—the German Regular Army. There is little reference to the National Socialist para-military units and political organizations so overly emphasized by amateur writers and the cinema industry.

The photographs are outstanding, many of which have not been seen in America before, and a collector's find.

This is the first authoritative reference book on the subject in the English language and a must for the historian, uniform buff and professional soldier. Unfortunately, the general reading public may find it much too technical and specialized a subject for the price.

Colonel Eugene F. Ganley
The Institute of Heraldry, USA

OLD ARMY PRESS BOOKS ON THE CIVIL WAR AND INDIAN WARS

In American history the fascination of the Civil War and the Indian Wars never wanes. The demand for literature on our 18th century conflicts has been spurred by the population expansion, a heightened social consciousness, and a proliferation of libraries. Many of the more valuable sources have been long out of print; many of the events and personalities have invited updated treatments based on a re-evaluation and redeployment of old evidence if not the presentation of new. Among the publishing houses to move into the Civil War-Indian Wars field with some useful reprints and new items is the Old Army Press, established by Air Force Captain Michael J. Koury at Bellevue, Nebraska, and now based at Fort Collins, Colorado.

Old Army Press has bracketed George Armstrong Custer's combat career with *East of Gettysburg: Stuart vs. Custer* (1970, 78pp., map, illus., bibliog., $6.00) by David F. Riggs, and *Diaries of the Little Big Horn* (1968, 82pp., end map, illus., bibliog., 7.00), introduced by Koury.

The Gettysburg book deals with Custer's first engagement as a general officer, one in which J.E.B. Stuart is defeated by the Union Cavalry that he had often routed. The book is valuable for its confirmation of Custer's skill, daring and leadership, qualities besmirched by the outcome at Little Big Horn.

The Big Horn book offers 15 personal accounts from various levels and elements in the 1876 expedition. It is useful as a compilation of contemporary materials that must necessarily serve as the foundation of any attempt to deal with a highly controversial battle about which the final word has certainly not yet been written.

Few comprehensive accounts of the Indian Wars were issued in the half century that followed the events. Those by Dunn, Grinnell and Fry, for example, all had limitations, were published in small editions, and went out of circulation until recent times. The moment was propitious when Fairfax Downey moved in 1941.

Now, thirty years later, Old Army Press has reissued Downey's *Indian-Fighting Army* (1971, 319pp., illus., bibliog., index, $10.00). The book spans the quarter-century of Army-Indian conflict, from Platte Bridge to Wounded Knee. It is colorful, readable and well illustrated. One episode of the Indian Wars is missing from the book, that of the 2d Cavalry's campaign against the Piegan Indians in Montana in 1870. The Old Army Press has filled the gap with the publication a century later of *Strike Them Hard* (1970, 146pp., end map, illus., index, $7.00) by Robert J. Ege. The book is important as the first complete account of one of the lesser known events of frontier history.

Art has been a popular form of expression in the field of Western Americana, and Old Army Press has published an appealing item in John M. Carroll's *Buffalo Soldiers West* (1971, 64pp., illus., $7.00). Thirteen artists participate in this overview of the black soldier's role in opening the West, and except for Frederic Remington who is represented by several drawings, the artists are 20th century practitioners. The book is important because, while it is difficult to match the work of Frederic Remington and some of his contemporaries, we have long needed to develop following generations of artists to carry on the tradition set by the masters.

William Gardner Bell
OCMH

D-DAY: The Normandy Invasion in Retrospect

by The Eisenhower Foundation. University of Kansas Press. 254 pages. 1971. $7.50.

A collection of scholarly papers presented at the Eisenhower Library on the occasion of the 25th anniversary of the Normandy invasion. A distinguished company of correspondents, historians and participants contribute recollections, perspectives and commentaries on representative aspects of D-Day, Normandy. Worthwhile reading for the student of military history.

DAS

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By B. H. Liddell Hart. This magnificent work is based largely on his personal collection of private documents and the author's constant study of the day-to-day events of the war. Must reading for students of military history. 768 pages.

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By Peter Elstob. In this detailed account of the surprise German assault that triggered the Battle of the Bulge, the readers are given excellent overviews, but it is in small unit action that the author excels. Good illustration of the ease of defense and the immense difficulty of the offensive. 413 pages.

THE FIELDS OF BAMBOO . . . . . $ 6.95

By S.L.A. Marshall. This is his latest account of American soldiers at war during the battles of Dong Tre, Lung Luong and Hoa Hoi. A vivid description of the officers, NCOs and other soldiers who fought in the victories. 242 pages.

GENERAL

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By Colonel Wesley W. Yale, General I. D. White and General Hasso von Manteuffel. Foreword by General Lyman L. Lemnitzer. Three thinking soldiers make a strong case for blitz warfare as an alternative deterrent to either nuclear holocaust or attrition. Their views on the leadership required to make such a defense posture a reality are stimulating. Must reading for the far-sighted military professional. Maps, charts. 257 pages.

MILITARY MEN $6.95

By Ward Just. This book is now being widely discussed. There is much disagreement on whether it is for or against the Army, fair or unfair, true or untrue—in whole or part. It is must reading for the Army man of today. 252 pages.


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IRAQ
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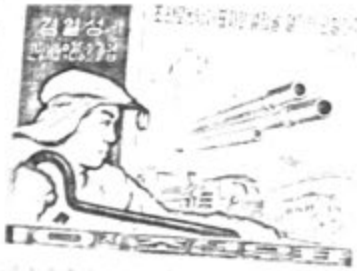
ВЕЛИКАЯ ОТЕЧЕСТВЕННАЯ ВОЙНА 1941-1945
1963 ПОЧТА СССР

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FRANCE
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GÉNÉRAL LECLERC


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1963 ПОЧТА СССР 6К


М.В.ФРУНЗЕ


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