

# ARMOR

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TEAMWORK  
JANUARY-FEBRUARY, 1958  
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## THE BEST SELLERS FOR 1957

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# ARMOR

## The Magazine of Mobile Warfare

Continuation of THE CAVALRY JOURNAL

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# LETTERS TO THE EDITOR

## The GOERS

Dear Sir:

I read the article on GOERS in the November-December issue of your magazine with great interest. I consider it to be the finest article of its type that I have ever read in any magazine. It was extremely interesting to me as I spent approximately one half of my service in Research and Development, particularly in the automotive fields.

In the present era where mobility for ground troops is of paramount importance, I believe that Colonel McKee has pointed the way toward a major breakthrough where no significant improvements have been made to my knowledge since the last war.

If Colonel McKee has any further articles in this field, or similar subjects, I am sure they would be of great interest to everyone who is concerned with the future of armor.

R. R. ROBINS

Executive Assistant  
Ford Machinery and Chemical Corp.  
San Jose 3, California

## More GOERS

Dear Sir:

Reference Lieutenant Colonel McKee's article on the GOER vehicle principles in the November-December 1957 issue, I have the following questions:

1. What will be the maximum width of the bed of such a vehicle when the restrictions on vehicle width as set forth in AR 700-105 are applied and the necessarily greater width of the tires for the vehicle is considered?

2. Will vehicles of this nature be considered "special purpose and combat," with a width limitation of 144 inches?

WILLIAM L. CLARY

Chief, Wheel Vehicle Section  
Automotive Department, TUSAAS  
Fort Knox, Kentucky

## And More

Dear Sir:

The article entitled, "The GOER Concept" in the November-December issue of ARMOR by Lt. Col. Gregg L. McKee was certainly something that many of us have been waiting for a long time. I feel that Col. McKee and his associates at the US Army Armor Board have hit upon a solution that is sound, simple and cheap to this problem of mobility for the tactical support vehicle, which after all are the vehicles that keep our combat vehicles rolling. The present family of wheel vehicles does not have

the inherent cross-country mobility that we must have to operate with armored units without being tied to a good road net.

In my opinion, GOERS have great promise. The idea should be exploited to the maximum. Any efforts that can be made to bring this article to the attention of a greater scope of Army readers should be done because it is a concept that is of equal importance to Infantrymen and Artillerymen as well as to Armor people.

ARMOR has done great service in recent times by publishing articles and stimulating thinking on this mobility problem. The book review on "The Theory of Land Locomotion" together with the "GOER Concept" has presented some very thought provoking material along these lines which should bring tangible results to those of us who would like to see some truly cross-country-mobile vehicles.

The Army may well preach mobility, but it will not truly have it until it can produce support vehicles that can go with the combat vehicles and keep them moving without continually returning, or operating in close proximity, to a good, all-weather road net. Our present family of wheel vehicles does not have this capability except under favorable weather conditions. GOERS seem to be an answer that is practical, simple and cheap. The concept should be exploited to the utmost.

The trend we have been following in recent years in our general purpose vehicle development program has been very evolutionary, with complexity multiplying every step of the way. Costs have adjusted upwards accordingly. The disappointing part of this development program is that we have failed to realize

significant advancement in mobility.

It is good to see an idea that is perhaps a little more revolutionary, but in which the stress is being placed on cross-country performance, reliability, ease of maintenance, simplicity, low initial and low operating (in terms of payload and efficiency) cost. This approach is a fine step in the right direction and should be continued in all development work where it can be applied.

Please give us more of such articles.

1ST. LT. L. H. PUTNAM

Commanding Officer  
109th Tank Company (90mm gun)  
Fort Sill, Oklahoma

## The National Guard Issue

Dear Sir:

Your special National Guard issue (Sept-Oct) has proved itself to be an outstanding, and lasting, contribution to the national and community relations of the National Guard. We are already using the material presented, and will continue to do so in the future, as evidence to our friends and neighbors of the sound investment which they have in the National Guard as a State-administered military force, a decentralized military force in an age that demands decentralization as a matter of survival.

Since the National Guard may well be the force that decides whether another World War ends in victory for the United States or another and deadlier Korea-type stalemate, it is important that every Guardsman knows the strengths and limitations of his unit and his component. By pointing out the distance traveled and the road that lies ahead, ARMOR has made a significant contribution to the morale and continued improvement of America's oldest military force.

KENNETH W. GETTY

1st Battalion, 104th ACR  
Pennsylvania National Guard  
Carlisle, Pennsylvania

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**Rates:** See bottom of contents page.



## A Wrong Photograph Credit

Dear Sir:

On page 17 of the Sept-Oct issue you show a picture referred to as the 48th Armored Division firing on one of the many tank ranges at Fort Stewart. The photo is credited from the Georgia-Florida National Guard.

That picture is one of the 105mm M7 Howitzer crews of Howitzer Co, 3rd Bn, 116th Armored Cavalry Regiment, Idaho National Guard during Field Training at Gowen Field, Boise, Idaho, June 1955. This crew is still with this unit of the guard, with the exception of the Chief of Section who is a sergeant with the U. S. Army and stationed at Fort Sill, Okla.

This unit has enjoyed very much this particular issue.

LYLE K. BRENNEMAN

Howitzer Co, 3d Bn, 116th ACR  
Idaho National Guard  
Hailey, Idaho

• The photograph on the right should have been credited to the Idaho National Guard. Ed.



Idaho National Guard

## In Reply to a Letter to the Editor

Dear Sir:

This letter is to express my thanks to you and your staff at *ARMOR* for publishing my letter requesting assistance in locating a handbook on the Italian Forces.

To date—2 December—I have received two replies from Italy and 61 cards, letters, offers of aid and advice from people here in the States. These letters are from all ranks and all branches of the Armed Services except the U. S. Coast Guard.

Hence my research is progressing thanks to all who have replied.

JAMES H. GRAHAM, JR.

5700 Chillum Heights Drive  
Hyattsville, Maryland

## ROTC Awards for GMS Institutions

Dear Sir:

The Association of the US Army has been doing an excellent job of building up an organization to work for the Army. Here at the university a chapter of that organization is in being and is doing a great deal in increasing the professional interest among the advance course cadets. However their publication cannot cover the field.

It seems to me the Armor Association has a program designed to increase professional interest among Armor cadets at branch material schools. What can we offer students at GMS Schools?

CAPTAIN RODNEY R. REHFELD  
ROTC Detachment  
University of Connecticut  
Storrs, Connecticut

• Cadet rates for Association membership are \$3.00 per year. This entitles them to receive the magazine and the Newsletter for the year. Last year we offered through PMS&Ts, one-year honorary memberships and a package of several books to the top GMS graduate at each GMS institution who chooses *Armor* as his branch. Where the student was already a member we extended his membership accordingly. More than 40 institutions took advantage of this offer. We intend to repeat this offer this year. Ed.

## It Is Now Armor Battalion

Dear Sir:

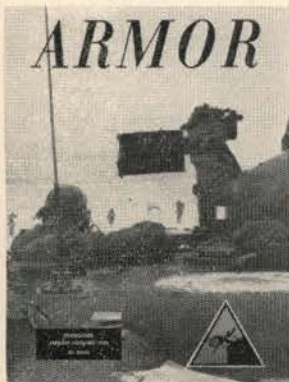
During the last few months, members of this Battalion have been watching, with keen interest, the growing of the Armored Division under the R.O.C.A.D.

In viewing all the data available from the United States Army Armor School, we find that the Tank Battalion (90MM Gun) has been redesignated (Armor Battalion 90MM Gun) in accordance with "Reference Data Armor Units (ROCAD) and (ROCID) United States Army Armor School, dated May 1957.

However, we noticed in your November-December issue, page 6, figure one (1), you are still carrying the Tank Battalion (90MM Gun) on your Divisional Table of Organization.

We would appreciate a clarification as to which of the two designations is the correct one.

LT. COL. ALMOND E. FISHER  
27th Reconnaissance Battalion  
27th Armored Division, NYNG  
184 Connecticut Street  
Buffalo 13, New York



## THE COVER

The picture on the cover was taken in Bavaria several years ago. It depicts men of Company B, 759th Tank Battalion, providing overwatching tank fire as elements of Company C, 29th Infantry Regiment advance during a training problem near Munich, Germany.



• Upon receipt of this letter we checked this matter out and find we were in error. At the time this article was prepared the title was correct. However, since that time changes were made which make our chart incorrect. We sincerely hope that too many people were not confused and appreciate this letter for purposes of clarification. ED.

### British Interest in the GOER'S

Dear Sir:

Your article in the November-December issue of *ARMOR* on the GOER concept, pages 31-50, made a considerable impact on one of the greater newspapers of Great Britain, the *Times*. A clipping of their editorial, published on 10 December, is enclosed.

COLONEL JOHN L. ATKINS  
Box 79, U. S. Navy 100, FPO  
New York, New York

• As a matter of interest the editorial is herewith reprinted.

Most military lorries differ little from standard commercial vehicles. Their cost would be prohibitive if they did. But as modern roads improve, particularly in America, the standard commercial vehicle is modified accordingly until it is in danger of becoming too effete for military requirements. Its capacity for cross-country work becomes less and less. The United States Army Armour Board has recently produced an idea, called the GOER concept, for a new family of military vehicles more suited to the demands of modern warfare. An article in the current issue of the American magazine *Armor* describes how the Board has taken its inspiration from the rapidly growing earth-moving industry which produces vehicles like dumpers, scrapers, and rollers whose natural habitat is mud rather than macadam.

The main characteristic of the GOER family of vehicles is that they have very large low pressure tires, which gives more manoeuvrability for less power over difficult country. Each vehicle consists of a two-wheeled prime mover of the kind used by earth-moving contractors, with a trailing load-carrier behind in place of the civilian dumper or roller. Powered steering swings the entire axle, which carries not only the wheels but also the prime mover itself and the driver. It is therefore possible for the whole equipment to turn round in less than its own length—a feat that is beyond even the London taxi-cab.

It is unlikely that a vehicle of this kind could be an economic or practicable replacement for very small military vehicles, and the first GOER vehicle selected for development is in fact a fifteen-tonner. This is the logical starting point, because it is the average size of the earth-moving machines being manufactured commercially. The idea would be impracticable without a civilian industry on which to base military production, but now that it does exist the possibilities ought certainly to be explored. Mobility is perhaps the most difficult of all the military virtues to secure and one of the most valuable.

### On Map Symbols

Dear Sir:

I would like to take exception to some of the "school solutions" presented in the very fine article "The Combat Arms Regimental System" by Major Olin C. Harrison which you published in the November-December issue of *ARMOR*.

I agree completely with the discussion of the Combat Arms Regimental System and its application to unit designations. However, the application to map symbols seems to be inconsistent and not in keeping with current techniques. Major Harrison states that "the general principles of forming map symbols are unchanged," and then proceeds to change the principles as depicted in Figure 2.


Specifically, the designation to the right of the symbols are misleading. As shown they depict both the battle group (battalion) (squadron) and the parent regiment. FM 21-30, Military Symbols, and STANAG 2019, Military Symbols, both state that the parent unit designation will appear on the right of the symbol plus any additional or explanatory information required. To the left of the symbol will appear the sub unit, sub-sub unit, or sub-sub-sub unit as required. Applying this principle to the symbols in Figure 2:

#### UNIT

Trp A, 1st Recon Sq, 31 Cav

A 1  31

1st Tk Plat, Trp A, 1st Recon Sq, 31 Cav

1 TK A 1  31

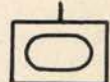
Task Force 1/101 (battalion task force formed around 1st Armd Rifle Bn, 101st Inf)

TF 1  101

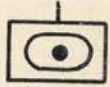

1st Med Tk Bn (Patton), 1st Armor

1  1



Team B [company team formed around Co B, 1st Med Tk Bn (Patton), 11th Armor]

B (TM) 1  11

Btry A, 1st How Bn (105-mm) (SP), 61st Arty (wpn symbol used only when required for clarity)

A 1  61  
 105

1st Plat, Btry C (8-in How) (SP), 1st FA Bn (Rkt/How), 91st Arty



1 C 1  91  
 8  
(RKT/HOW)

NOTE: The term Rkt/How to the right of the symbol is really not required, any more than the term "howitzer" would be required in the symbol immediately above. If included there is no need for parenthesis.  
(wpn symbol used only when required for clarity).

1st Bat Gp. 21st Inf

1  21

2d 81-mm Mortar Squad, Wpn Plat, Co B, 1st Bat Gp, 21st Inf (wpn symbol used only when required for clarity)

2 B 1  21  
 81

520-6 Kearney  
Fort Leavenworth, Kansas

MAJOR EUGENE C. CAMP



## *Cooperation Among the Services*

The Department of Defense recently released a "fact sheet" on Armed Forces Day for 1958. This release contained many interesting facts that are considered worthy of repeating. All of us—in and out of the service—should spend some time on its study.

Few people realize but it is only since 1950 that the services have combined on a single day of observance. Armed Forces Day is intended to symbolize the unification and cooperation that exists between the services. It also serves to give the American people an annual report on the state of readiness of the nation's military strength.

Since its inception various slogans have been used to emphasize the basic concept that our national security is dependent upon the power which comes from teamwork and national unity. For example the year 1950, when this concept was originated, the slogan "Teamed for Defense" was used. During the succeeding years the slogans were: 1951—"Defense of Freedom;" 1952—"Unity-Strength-Freedom;" 1953—"Power for Peace." This last slogan was deemed so appropriate that it has been used every year since and will be adopted again this year. However in some areas overseas it has been slightly altered to emphasize the fact that we and our Allies are "Partners for Peace." The recent NATO conference has proved this to be true.

Another interesting fact is that there is no single day set aside this year for the observance. The period of observance has been set for the week, 10-18 May. Hence you will note that there is considerable flexibility and latitude in this year's observance. During this period the services will demonstrate the unity and cooperation which exists between them. However, from the headlines of late it would appear that there is no cooperation between the services in any shape or form. According to some of the various schools of thought, interservice rivalry has deterred the nation's defensive efforts.

Armed Forces Day is not to be observed once a year. Interservice cooperation should be demonstrated

to the public every day. Whether the various charges stating that interservice rivalry has hurt the defense effort are true or based on half-truths is immaterial at this point. We must, in the services, exert every effort to dispel such statements. We, in the Army, should take every opportunity to publicize our cooperation with the other services. This is a year-round project and not one to be exhibited only on Armed Forces Day.

The public often believes that interservice rivalry is caused by the various services as they make their annual pitch for their share of the defense budget. It is difficult to conceive any chief of staff, regardless of his service, not desiring and trying to get what he truly believes his service needs in the matter of dollars and cents to carry out his mission on the defense team in preparation for an exigency or in an actual period of hostilities. If this is interservice rivalry I am afraid the onus will stick with the American people for a long time.

Since the Soviet display of equipment in Moscow on the 7th of November it has become increasingly apparent that they are well equipped to fight either a tactical atomic or a conventional type war. We must likewise be prepared to enter battle in either type conflict. Consequently we must make our pitch to get the appropriations to be prepared. Again, if this is interservice rivalry the onus must stick.

How can we combat these misconceptions of lack of cooperation that many people believe exist between the services? We are well aware that there is no such thing as a separate land, sea or air war. Hence interservice cooperation in peace time is as necessary a commodity as is modern equipment and up-to-date tactics. And we must make known to the public what we have achieved and what we are doing in order to put ourselves in the proper light.

At the risk of reducing ourselves to the level of the originators of these misconceptions we must challenge misstatements of fact and let the people know what is true and correct. Otherwise we will lose their trust and confidence at a time when we need it the most.



# LEADERSHIP WEST OF THE IRON CURTAIN

By JAC WELLER

**A** CASTLE stood on a steep hill three miles away. World War II artillery fire had partially wrecked it. But it was east of the Iron Curtain and must have had a superb view of everything in West Germany for miles. The Communists were using it for a watch tower. A spot of light came from under a temporary wooden roof.

"Those people are looking at us. That flash was the reflection of sunlight in a telescope. They have the advantage on us in this sector," said the CO of a U. S. Armored Cavalry battalion in a Southern drawl.

They certainly did. The Border is as crooked as a snake in many places. Here, a small salient of West Ger-

many protrudes between the steep hill with the ruined castle on top of it to the north and an almost equally high hill crowned by a wooden watch tower to the south. Both these look-outs contained Communists. Had they wished, they could have quickly destroyed with artillery fire the U. S. observation post which was only an armored personnel carrier. It was parked on a low hill about in the middle of the salient.

"Your expression, 'Those People', reminds me, Colonel, of another Southerner who used the same words to refer to his opponents during the Civil War," I replied.

"You're thinking of General Lee. It's curious that we should use the same 'those people', but most of us do." He saw the astonishment on my face that he should have picked up my allusion so quickly and continued, "Many of us know a good deal about General Lee. Not all of them are Southerners either."

I found that this was definitely true; more officers than I expected were quite familiar with American

military history in general. Even more important, they have developed similarities in leadership to many great American commanders of the past. Their Border duty is particularly likely to produce leaders. Even platoon CO's have what amounts to independent commands.

## Western Perimeter Defenses

Neither the United States nor West German forces make any effort at a "penitentiary wall" type border. The United States forces do not occupy any observation posts continuously, but move from one to another at unpredictable times. The Border is far too long and winding to be really efficiently closed by the American Armored Cavalry forces available. Primary control of the border is in the hands of West German Border Police; unpredictable U. S. Armored Cavalry patrols supplement the West German efforts. A part of each regiment is continuously on duty at strategic small camps or barracks just back from the actual Border.

The whole plan of Western de-

**MR. JAC WELLER**, is a firearms consultant and engineer, and has written extensively on military and weapons history and tactics. He is an honorary curator of the West Point Museum and adviser in connection with old weapons to several branches of the Department of Defense. This article is based upon actual experience with the Seventh Army in Europe; the author visited also other NATO armies with full accreditation, to write about their small arms, weapons tactics and training.





*Some aspects in the art of command are cited by the author, who visited the border this past summer. Not only do these old techniques apply but some innovations are instituted as our commanders gain experience. His historical examples are worthy of some study.*

---

fense is based on economy of force. The Armored Cavalry is ideally constituted for the first line of this duty. Its job is threefold:

*First*, to provide some sort of border integrity; those from behind the Iron Curtain should respect West German territory.

*Second*, to give intelligence of any border crossing or other unusual occurrence.

*Third*, to oppose any actual attack with force.

These things must be done at a moment's notice and amid civilians and soldier allies speaking a different language. There are really two Borders; that between West Germany and East Germany is now not extremely unlike any other peacetime border, at least for both the East and West Germans. The West German-Czechoslovak Border, on the other hand, is virtually uncrossable from west to east and sometimes the scenes of murderous exchanges of fire.

The actual numerical strength of the U. S. Armored Cavalry deployed

west of the Iron Curtain is small, but their striking power relatively large. These regiments are equipped with superb matériel which is, however, deployed over wide areas. It must be kept ready at all times to react immediately and efficiently. These Armored Cavalry units must be able to change from peace to war in literally ten minutes or less.

One regimental CO has a habit of sending a "Test Transformation Order," or even allowing a guest to send one at any time he chooses. This radio order could be actual war; it's timed from the moment it's given until it reaches every single unit headquarters in the entire regiment and is confirmed back to regimental headquarters and back to the sender. The time elapsed, usually four to six minutes, would be that required to start every single man in the entire regiment tumbling out of bed, mess, recreation or special assignments into the regimental fighting vehicles.

Every Armored Cavalry patrol has ammunition racks filled and live ammunition belts actually in the ma-

chine guns with similar arrangements made for other weapons. Every man has his individual weapon loaded. Procedures have been worked out for every single unit so that they know precisely what they should do in the event of an emergency. The real fighting power of even a reconnaissance company is in its tanks; these and self-propelled artillery pieces are held back from the Border, but are in instant readiness to respond to commands.

#### **Leadership Around the Clock**

No amount of physical preparedness, however, nor printed procedures, can be expected to work by themselves. One of the most difficult assignments that soldiers ever have is a constant and continuous alert which goes on day after day, and perhaps even year after year. Throughout military history, there have been so many instances of surprise. Americans have suffered their share, including Pearl Harbor.

The Armored Cavalry on the Border, however, is counting on leader-





ship of unit commanders from the squad to the regiment to avoid disastrous surprise. I was extremely favorably impressed by the team spirit engendered by CO's of all grades. Written rules become a mockery, if allowed to become dead in spirit. This does not happen. Each new enlisted man cannot help but be impressed by the serious attitude and level best efforts of his officers and noncommissioned officers. These men deal with every Border situation as if it might be a real emergency; they are so habituated to the procedure that no one sees anything in any way unusual in this continuous maximum security treatment of events which usually turn out to be of small importance. Practice and precautionary sudden full fighting potential maneuvers are done in dead seriousness. These units all have continuously the feeling that the next one may be real.

All ranks have become abnormally good at this continuous vigil. I was astonished at the ability of a company CO to awaken fully in a matter of seconds about 4:00 o'clock one morning, handle a situation demanding his own personal attention, and then a few minutes later upon receiving a favorable report go back to sleep almost immediately. J. E. B. Stuart, the Confederate Cavalry Commander, had this facility for waking up completely alert and ready to make decisions. I discussed with the young officer the next morning his own ability along this line and found that at least to some extent it can be cultivated.

### **The Importance of Leadership**

There is, of course, more to leadership than producing continuous alertness. The finest soldiers and material amount to little in war unless properly handled. Mere numbers of soldiers and even their superior quality is not always enough to insure success. Brilliant organization, tactics and strategy will accomplish far less than the maximum attainable success, if the magic ingredient of leadership is lacking. Leadership, like many of the truly great qualities of the human personality, is easier to recognize in an individual than to define in words. However, it is not so mysterious as some would have us believe. Let's discuss some aspects of it as they appeared during a brief visit to two Ar-

mored Cavalry regiments stationed along the Iron Curtain in the summer of 1957.

### **The Tangibles of Leadership**

Some of the more important qualities that contribute to leadership are simple and obvious. A serious attitude of mind towards the duties of a soldier and a desire to excel in carrying them out is of paramount importance; a basic achievement along these lines is absolutely necessary. In order to be a good leader, a man must first be a good soldier. Military smartness, discipline and know-how are extremely important. Every real leader in American military history from Francis Marion to Omar Bradley has had a tough hard core of the real soldier somewhere within him.

Further, a leader must have a general proficiency and knowledge of his job. Academic brilliance demonstrated at an early age is not imperative. However, Douglas MacArthur and Maxwell Taylor stood one and four respectively in their classes at West Point. Robert E. Lee was second in his. Great American commanders do not always come from even the top half of their classes at West Point, or elsewhere. However, in almost every modern instance of an outstanding success made by a man well down the academic rating, the officer who achieved it was a man who retained, or even formed, the habit of study in middle life. General Maxwell Taylor pointed this out in his address to the West Point graduates of 1956. The really successful military commanders in American history have, regardless of their standing in college, been men who took pleasure in learning all there was to know about the details of their jobs.

A man who aspires to leadership of soldiers must have physical health sufficient to withstand the strain of emergencies. He must be basically fair and honest in his dealings with his superiors, his equals and his subordinates. He must have the moral fiber and steadfastness to handle emergencies both large and small. He must be brave; courage is a primary attribute of a soldier.

### **The Intangibles of Leadership**

The intangibles of leadership are less obvious than intellectual brilliance, military smartness, bravery in

action, physical stamina and the like, yet they are equally important. An officer, or noncommissioned officer, can achieve his real potentiality for command in line with his tangible qualifications only if he has the intangible qualities also. Some officers in our history and in the army today seem to possess almost every tangible quality required to be a good commander and yet for some reason fail to achieve that distinction. Braxton Bragg was like this. Excessive wrangling with others is even more deplorable today than in Civil War times.

### **Diplomacy**

Throughout history and particularly today, the qualities required to get on with civilians and allies have been important to soldiers. In Germany today, American officers of relatively low rank have to be able to get along with dense populations of German civilians and their renascent army units. If we are not reasonably decent guys, they will at least think about changing sides. As rank increases, responsibility also increases to try to prevent anyone from thoughtlessly endangering even locally the present excellent feeling between the United States Army and the German civil and military populations.

Soldiers, being human, are not perfect. The tragic rape of a German girl of 15 by U. S. soldiers at Bamberg was deplorable. However, a certain Armored Cavalry battalion, aided by many other factors, has done all that was humanly possible to restore good relations here and succeeded almost miraculously well. The CO's account of the long road back into the good graces of the civilian population was essentially just a series of neighborly, friendly, considerate gestures and kindnesses.

### **Twenty-four Hour Association**

To some extent throughout the entire United States Army, the old somewhat artificial barrier between officers and enlisted men has been relaxed. This is particularly true of the Armored Cavalry units operating on the Border. Because of the dispersion of units and the close association on a 24-hour a day basis, particularly at company and platoon level, it is obvious that entirely separate dining and living quarters are impos-



sible. A single platoon cannot have separate dining facilities for one officer.

Even in larger units, the old privileges and privacies of rank are greatly diminished. In the Old Army in the American West, both before and after the Civil War, there was a natural cleavage between officers and men. The enlisted men were largely immigrants, at one time almost completely unlettered Irishmen. They hardly spoke the same language with the formally educated officers. However, our army today has few natural cleavages. A young private first class that I met on the Border was a Yale graduate and spoke five languages fluently; some fine officers didn't finish high school. A democracy which imposes a system of selective service on its youth cannot by the very nature of things also insist on a professional soldier type of discipline and complete artificial separation of officers and men. Proficiency as soldiers is currently the most obvious difference between ranks. Variations in quarters, food, uniforms and the like are all reasonable and compatible with our democratic way of civilian life.

It would appear that real leaders are not inconvenienced at all by this closer association with the men they command, but actually benefit by it. Common sense appears to have taken the place of rigid rules. A field officer will occasionally invite an enlisted man into his home. However, there is no undue familiarity; friendships which would warp impartial judgment seem to be very rare. Commanders from squads to armies benefit from knowing their men in a way that would be difficult under the old arrangements. The more an officer has his finger on the pulse of his command, the better he can direct its efforts. Further the better a group of men get to know their commander, the more respect they will have for him and the stronger the whole unit will be, if their commander is a real leader.

### **Leaders are Sometimes Heroes**

The Armored Cavalry, like almost all other military units of all time, is mainly composed of youth. Young men particularly have a strong potentiality towards hero worship. Great military leaders throughout all times

have risen in the estimation of their troops to the rank of demigods. George Washington in the American Revolution and Robert E. Lee in the American Civil War are perhaps the very best examples of this. Each in his time, and in a quite separate way, were looked on as superhuman by a good 95% of their soldiers.

The positions of Washington and Lee were undoubtedly due in part to spiritual values. However, Revolutionary General Dan Morgan, Confederate General Nathan Bedford Forrest and World War II General George S. Patton were heroes mainly because of their reputations for extreme physical and mental toughness. These three generals stamped their personalities on their entire commands. Their armies fought better because of it.

Men like Washington and Lee are rare; fighters of the stamp of Morgan, Forrest and Patton are not common. However, becoming a hero within an officer's individual command today is not difficult. I found evidence of it in unit after unit. Here a master sergeant would proudly relate how his CO had killed five men in World War II with the same M1 rifle. Another similar unit a few miles away boasted of a CO who won his Distinguished Rifleman's medal his second year in the army; they were proud of his hunting ability. A third unit had a commander whose prowess as an athlete at West Point and afterwards was well known.

The more or less physical abilities of the three men just mentioned appeal a bit more directly to young soldiers. However, many qualities of mind are also appreciated. A company commander was noted throughout his entire regiment for a rather minute study that he had made of many cavalry and armor battles of the past. Another was noted for his ability to repeat from memory many directives and whole pages of manuals. A third was so smart in his own personal appearance that his command imitated him.

These things are good; they bring units together and give them a common spirit, a common reputation to uphold. A commander need only be himself if he is worthy of command to find that some at least of his personal qualities are greatly appreciated, bragged about, here and there,

and perhaps copied by his unit.

### **The Problems of Responsibility**

In armies as in life, individuals sometimes endeavor to blame a subordinate for a failure which should rightfully rest with the commander. This attitude has an extremely unfortunate effect on any group of human beings. Real leaders throughout history have often been large enough to accept responsibility for failure. General Robert E. Lee said immediately to his soldiers at Gettysburg, "It was all my fault!" General Lee's unique position in the heart of the Confederate soldiers was in part because of this. This quality was extremely important in molding into a single team of a number of Southern generals who had rather well developed abilities not to get along with each other. Federal General John Pope, on the other hand, tried to shift the blame for his grievous defeat at Second Manassas to subordinate General Fitz-John Porter. His next command was of an expedition against an Indian tribe on the northwest frontier.

I found a company commander who had developed this quality of taking responsibility for failure to a surprising degree. He made it work very well indeed. Here's an instance. On maneuvers, a subordinate endeavoring to save time took two tanks through a mountain "pass" and smashed them both. The CO had ordered another safer route, but took full responsibility for the mishap; he saved his subordinate from both a poor record and possible personal liability for serious financial loss. The CO was no more really responsible for the two smashed tanks than General Lee was for the blunders of his subordinates at Gettysburg. However, both profited immeasurably with their commands by taking the blame.

This acceptance of responsibility for the errors and shortcomings of others can be easily overdone. The company CO referred to was well aware of this. If he felt that a subordinate had goofed for personal reasons and not because he was actually trying to do a good job for the company, he did not hesitate to charge him personally for the repair of a command car or the like.

Praise and honor for success, similarly, should never be taken by a



commander for himself alone. It's human for a man to see himself responsible for the success of his command. However, few things can be so injurious to him and his leadership as to get a reputation for taking all credit himself. It is far better to endeavor to pass on all praise to subordinates, or to the unit as a whole. Soldiers have always had peculiar abilities for knowing exactly what goes on in an army. They know who is really worthy of praise and will quickly set the balance right. The commander who gives to his unit all glory they win together is very smart indeed. Thomas Jonathan Jackson insisted so long as he lived that the sobriquet, "Stonewall", belonged to his brigade, rather than himself personally.

### Credit for Ideas

No commander will ever have all the ideas that he puts into practice in his unit. It is, of course, important that proper credit be given for these ideas when they come from others. Some commanders, however, throughout history have gone one step further. This was particularly true of George Washington. After a careful study of his Trenton-Princeton campaign in the winter of 1776, there can be little doubt that he had the overall strategy pretty well in mind several days before he actually carried it out. Yet he allowed General Arthur St. Clair to suggest the right flank march which was all important to the success of the entire campaign.

I sensed this same type of thinking when talking to a regimental CO; my idea was in part confirmed in lengthy conversations with his subordinates. The problems of a regiment in peacetime are not so serious as in war. But only by constant practice at problems as similar as possible to those of war can the efficiency of a unit be built up for an eventual emergency. This particular colonel endeavored to guide discussions rather than to dominate them. Perhaps there is no quality that so keeps a team of officers on their toes as the feeling that the CO not only wants, but will use, the ideas of others and is actually depending on his team as a whole for them.

An officer who thinks constructively and feels that he has at least a chance to be helpful idea-wise is a better officer. The commander who

can get from his subordinates the maximum in ideas, and keep them on their toes as well, is very fortunate indeed. There are, however, certain dangers. Meetings should not degenerate into debating societies. A firm control must be maintained.

General Nathaniel Greene in the Southern Theater of the American Revolution was noted for hearing out every subordinate with an idea, and then replying in detail. By so doing, he not only received ideas but also molded a team. It's perhaps too early to draw conclusions from World War II; however, it would appear that General Eisenhower has no superior anywhere in military history in bringing out the best in others and passing out to each a full measure of credit.

### Dressing Down Subordinates

In all human activities, it becomes necessary at times for the commander of a group to admonish one or more of his subordinates. This is never pleasant. The commander should first make sure in his mind that the admonition is necessary. It's only human to feel immediately upon hearing of an error, or other shortcoming, that it's more serious than it actually is. Further, in the press of other things, extenuating circumstances are sometimes overlooked; an act which appears to be deliberate disobedience may be just bad luck. Most successful commanders give only a relatively small proportion of the dressings down they at first contemplate. Once decided upon, however, it would appear the admonitions are best carried through vigorously.

Washington had a particularly quick temper. He held it in check, however, to a remarkable degree. On the other hand, Forrest seems to have fought some of his best actions "howling mad." If a commander loses his temper at all, he should cultivate the capacity for doing it at the proper time. Some men have been able to lose their tempers deliberately and in a manner calculated to do the most good.

One thing seems to be definitely established. No commander should ever hold a grudge against a subordinate. If necessary, remove the subordinate. However, in all other cases, let him know that no prejudice remains. One Armored Cavalry CO

told me he always went deliberately out of his way to show a recently dressed down subordinate that there are no personal hard feelings.

Another battalion commander with a particularly pleasing personality used an even more considerate procedure. Where possible he preferred to criticize without mentioning names. He would endeavor to single out individuals for praise, but use general terms for blame. He would say, for instance, "I want to compliment Captain Blank and his company for a good job done in painting their headquarters." When admonition was necessary, however, he would say, "We must do better than some of our men did in the little town of Dawn. The MP's picked up 14 men." The company CO whose men had misbehaved knew well that his men only had been at fault.

I found out later that the officers and men within this battalion appreciated their CO's restraint even more than he himself realized. They were fully aware, however, by his facial expression and other signs if he was displeased. His general method of getting his team to function well reminded me of that employed by General Winfield Scott in his campaign culminating in the taking of Mexico City.

### Human Intercourse

In the Old Army battalion and regimental officers saw so much of each other day after day 365 days a year on fairly close-knit posts that there was no problem of acquaintanceship. There was, in fact, much danger of close friendships which might influence a CO's judgment. However, in our far flung army today, with its relatively quick rotations, many strangers are continually coming into a unit. A CO is not likely to get to know well all the officers in his battalion or regiment unless he goes out of his way to do so. It's only natural that, other things being equal, a commander who knows, and is known by, his subordinates, will have a more effective team than one who does not. Mere knowing by face, name and personnel details is not enough. One must know the man under the military veneer.

In one instance, a young officer explained to me that his own battalion CO made a practice of inviting



two or three company officers into his quarters when visiting the Border. The battalion CO always had a bottle of Canadian Club; they would have a nightcap together. The young officer's words, as I remember them, were, "We never realized the Old Man was human. He is really a swell egg, not at all the type that he looks." The Lieutenant Colonel referred to as "Old Man" had only just had his fortieth birthday. He seemed to me to be very keen on his job, but otherwise not at all awe inspiring. However, to the lieutenant of 24 who told me the story, the classes of 1909 and 1939 at West Point probably seem almost next to each other. At any event, this battalion CO accomplished more along acquaintanceship lines with two ounces of Canadian Club in a paper cup than in several weeks of routine activities. This same social acquaintanceship between officers of all grades is always desirable. Some commanding Generals make a point of knowing all their senior unit commanders by arranging to spend considerable off-duty time together.

### Larger Leadership Problems

The problems of human leadership in small and intermediate units are not greatly different from what they have been for the last 3,000 years. Even the dispersion probable in atomic warfare won't be greater than that common in the Armored Cavalry regiments on the Border. However, above regimental level, there will be new leadership problems of space and time. Perhaps we don't yet know the problems, let alone the answers. However, they will be apparently of two types. First, there are the G2 problems of intelligence. Where are the different units of a given command? What are they actually doing? What orders should be given to them? Second, there are the pure leadership problems. Can a CG really impress his personality on a widely dispersed group of units? Can these units be made to feel a division and corps unity? Only when these things are achieved will the entire command reach its maximum effectiveness.

The Duke of Wellington at his first great offensive battle in Europe, Salamanca, controlled personally an army of approximately 50,000 men. He gave all major orders himself, either personally or through messen-

gers. He knew almost all the field and general officers in his army at least by sight. Every single soldier in the army knew him. Throughout the action, the Duke controlled his army and maneuvered it with a minimum of delay. He knew where every unit was continuously throughout the entire action.

In World War II and in Korea commanders of units numbering far less than 50,000 men had really no idea where all their men were, nor what was happening to them, nor how to get orders to them, nor what orders were necessary. Situations like this occurred time after time in spite of all the advances that have been made in the means of communication and the art of Military Intelligence. To some extent, the Korean breakdowns were due to just plain lack of practice. New men didn't know their jobs; elaborate intelligence teams had nothing but printed procedures. However, war today means dispersion and makes the old forms of reconnaissance impossible. Atomic warfare and the new decentralized divisions will greatly increase these problems. A commander may find his units spread over hundreds of square miles.

No one knows for sure what will be needed. There are a few things, however, that seem to be indicated with regard to leadership. The Armored Cavalry dispersions in Border duty are essentially very good experience for everyone concerned. Some people feel that American staffs today have a tendency to depend on radio and telephone to such an extent that they cannot get up and walk 50 yards, or get in a jeep and ride a mile. The commander and staff which knows best what's going on in the fog of war will undoubtedly continue to win, even if they have to walk and ride to find out.

At one time in our military history, our general officers were almost all superb horsemen. Their personal ability to move around and find out what was going on had a great deal to do with their success in military operations. It is probable that personal reconnaissance will continue to be of very considerable importance in the future. The German General Erwin Rommel was not nearly so brilliant a theorist as some of his contemporaries. However, the success of his Africa Corps was in part due to

the fact that he knew what was going on from personally being so often on hand where things were happening. There is an Old Southern plantation expression that may continue to be true even in Atomic armies. "There is no fertilizer like the master's footsteps." The commander who visits his units not only knows what is going on in them, but also keeps them on their toes.

### Conclusions

War and soldiering are changing rapidly. Still, in some ways, they are eternally the same. The efficiency of an army depends on many factors, both material and spiritual. The arms and equipment of the American army are probably the best that the world has ever known. Further, the health, the education, the mentality and the physical prowess of our boys today are better than ever before in America, or in any other nation. However, these are material factors. Napoleon once said that in war the material is to the spiritual as one is to three.

The most important single spiritual factor is leadership. The Armored Cavalry along the Border, along the Iron Curtain that separates the Western Democracies from Totalitarian Russian Communism, gives positive evidence of true leadership. Literally hundreds of fine young men from corporals to full colonels are giving these regiments and constituent smaller units the kind of moral and *esprit de corps* that means so much in war. Their efforts are based on an extensive knowledge of the past, true native intelligence and common sense. Because of the duty these regiments perform, they are perhaps more exposed to the type of leadership experience that will be required if war comes.

Leadership like patriotism and battlefield courage comes to its flower only in actual war. Everyone honestly and truly hopes that there will be no war. However, it's better to win a war than to lose one, even an atomic war. In the army, as in every other type of human activity, experience and leadership are important. With God's blessings and with the kind of real effort towards constant alertness and preparation for any emergency which one sees so clearly on the Border, we can face the future with confidence.



## UNITED STATES ARMY THE CHIEF OF STAFF

### To The Members Of Armor

On behalf of all American soldiers I extend congratulations and best wishes to the members of Armor on the 181st birthday of this mobile arm.

Throughout American history your predecessors in arms have fought with skill and tenacity in creating the heritage that belongs to Armor. Characterized by the dust of your columns and the thrust of your weapons, your combat arm has established a rich record of military achievement. Today, with the same spirit of dedication and *esprit* that has characterized its past, Armor contributes vital and distinct military strength essential to the success of the Army and the security of the Nation.

Yours is the pride and privilege of not only belonging to a distinguished fighting force, but also in being soldiers of a great Army whose members join me in voicing confidence in your professional ability and skill at arms.

/s/ Maxwell D. Taylor

MAXWELL D. TAYLOR

General, United States Army  
Chief of Staff

The message you have just read reaffirms the interest by The Chief of Staff in our branch. It is always a pleasure to receive such greetings and it is a privilege to pass them on to our members—in these pages.

For the past several years, we have taken this opportunity to review the highlights during the previous year. We simultaneously gaze into the crystal ball to try to see what is in store for us the next 12 months.

Since the establishment of the 12 December date as the Anniversary for Armor, first celebrated in 1953, and the annual recognition by The Chief of Staff of our branch, we have advocated that all Armor installations hold open house, ceremonies, parades and parties honoring the occasion. This has grown "activity-wise" recently. News of two of these occasions is reported in the News Notes in this issue. (See page 56.) We hope this will continue to grow and that we will receive many more news items commemorating this all-important date.

The year's Association activities saw the first issue of the Newsletter published in January. Throughout the year it was mailed during the interim months between issues of ARMOR. Reports from the field indicate it has been well received and we intend to publish it as long as it is financially feasible. Judging from what many members have told us, the monthly contact with the Association has brought us more membership renewals than heretofore. In fact, at an Executive Council meeting held in early December, it was unanimously approved to continue the Newsletter.

Our 68th Annual Meeting of the Association was held at Fort Knox in April. General Willard G. Wyman was elected to the Presidency, succeeding General Wiliston B. Palmer. Despite inclement weather, this was the third largest off-post turnout we have ever assembled. Two new pieces of equipment were on display publicly for the first time. These included the T92 light gun tank and the mechanical minelayer. A complete coverage of the meeting appeared in the May-June issue of ARMOR. Looking into the future, the Council voted to return to Fort Knox, the home of Armor, for its 69th Annual Meeting. However, every endeavor is being made to alter the program as much as possible in order that the presentations and other supplementary items will not appear "Old Hat." We are looking forward to a real professional gathering in consonance with the past five annual meetings and a chance to renew old acquaintances.

The first Armor Association Award to the honor graduate of the Armor Officers' Advance Class was given during the June graduation at Fort Knox. The recipient was Captain Crawford Buchanan, who was presented with a silver "Revere" bowl appropriately inscribed.

Reference to Gyroscope, the 11th ACR from Knox exchanged billets with the 6th ACR in Germany. The 4th Armored Division is presently completing its Gyroscope move to Germany from Hood exchanging places with the 2d Armored Division. The advance parties of the 2d ACR from Fort Meade and the 3d ACR in Germany have already moved, making the second gyroscope move for these two fine old outfits.

With the cutback in strength in the Army, we took our first serious decrease in Armor in late December when the 1st Armored Division was converted to a Combat Command at Fort Polk. This self-explanatory message from The Chief of Staff of the Army to our Association President is published on the opposite page.

The Draper trophy was won by the 1st Platoon, Company B, 2d Medium Tank Battalion, 33d Armor under the command of Second Lieutenant Gary L. Clark at Fort Polk in early December.

All Active Army Armor Divisions have completed their reorganization under ROCAD. It is anticipated that the six National Guard Armored Divisions will commence conversion in the Fall of 1958. Owing to minor changes in Armor, it is believed that the conversion can be speedily accomplished in the Guard.

The report by the *ad hoc* committee in the November-December issue (See page 22) plots our future regarding new equipment. The National Guard is now being supplied with M48 medium tanks. It is also anticipated that they will receive more M75 Armored Personnel Carriers this coming year.

Summing up, it has been a profitable year and we hope the future will be bright for our Army, our Branch and our Association. All three organizations are interested in the same product—the best defense for the greatest nation in the world.



**UNITED STATES ARMY  
THE CHIEF OF STAFF**

28 November 1957

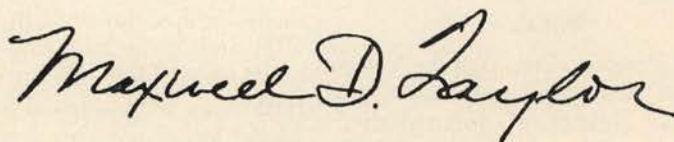
**TO:** General Willard G. Wyman, President,  
United States Armor Association

On behalf of the United States Army, I should like to inform the membership of your association of the conversion of the 1st Armored Division to an Armored Combat Command. This change is scheduled to take place on 23 December at Fort Polk, Louisiana.

The Army takes this action with sincere regret. On the battlegrounds of Africa and Italy, "Old Ironsides" fought gallantly and effectively to help defeat the Axis forces during World War II. More recently, the division performed the vital mission of contributing significantly to our national military posture as an essential element of our deterrent forces. I am confident that in any future emergency, those who fight under the colors of the 1st Armored will carry on in keeping with its distinguished history and tradition.

The current requirement to reduce the Army's strength has made it most difficult to retain some of our more famous divisional designations within the active Army. In the case of the 1st Armored Division, we must remove it from our active rolls as a division, but rather than inactivate the entire organization, we shall keep one of its combat commands on duty as its representative. This unit will be designated as Combat Command A, 1st Armored Division, and will be considered part of the division. It will retain the colors, trophies, and impedimenta of the division and, I am confident, will prove a worthy representative of "Old Ironsides"—ready to meet whatever challenge the future may hold.

I hope this information will serve to allay any concern you may have felt about the reported inactivation of the entire 1st Armored Division.



MAXWELL D. TAYLOR  
General, United States Army  
Chief of Staff



# The Structure and Functions of Armored Divisions

By RICHARD M. OGORKEWICZ

*This article is the initial installment of a three-part series concerning the past, present and future organization and employment of Armored Divisions. The first part deals with the British and Soviet organizations. Part two will present the German and American armored formations. Part three will give the evolution of the French Armored Division and conclude with a synthesis of the entire development of armored divisions . . . . . ARMOR is pleased to present this, the first part of the series by one of its outstanding contributors.*

**A**T a time when the impact of world events compels the rethinking of military policies and basic philosophies it is inevitable that armored divisions should also come up for discussion. Their structure and functions are both being widely and critically examined and are the subject of experiments and field trials in many parts of the world.

Much of the discussion revolves around the development of armored divisions to date and it is certain that whatever decisions are reached they will be based upon the accumulated experience of the past as much as an assessment of future possibilities. This being the case, it is essential to have a clear picture of the development of armored divisions, not only as it concerns the latest experiments and organizational changes but, also, the basic ideas which go back as far as World War I.

## British

It was soon after World War I that the first steps were taken toward the creation of armored divisions. The lead was taken in Britain which by the end of the war had built a powerful Tank Corps. It com-

prised no less than 26 tank battalions and already had to its credit actions, such as Cambrai and Amiens, involving more than 400 tanks at a time. Moreover, the Tank Corps had as its Chief of Staff, General J. F. C. Fuller, the foremost prophet of tank warfare, and it was he who, in 1919, submitted a memorandum proposing a further extension of the successful employment of tanks.

In essence, the proposal was that further progress should be through a gradual mechanization of the infantry divisions and it included a new organization in which each infantry battalion was given an organic tank company. There was also to be a tank battalion at divisional level but to start with General Fuller suggested the formation of an experimental infantry brigade to carry out practical trials.

Some half-hearted attempts were made in that direction in 1920 and 1921 and in the following year Captain Liddell Hart submitted an even farther reaching proposal for a "New Model Division." This was, in effect, a large armored division which was to consist of three composite mechanized brigades, each of one heavy and one light tank battalions, three small infantry battalions in armored carriers and mechanized artillery. There was also to be a divisional tank battalion, bringing the total of tanks per division to 300.

However, it was only in 1927 that an experimental Mechanized Force was assembled together on Salisbury Plain, in the South of England. By this time General Fuller had veered toward the idea of armored forces consisting almost entirely of tanks and the "all-tank" trend had already begun to exercise a powerful influence. It was foreshadowed in 1916 by General Martel in one of the very first papers on the organization of armored forces and was initially largely inspired by the "landship" concept of the tank, a concept which visualized the tank as the direct equivalent of the warship on land. When, after a time, this concept went out of fashion the "all-tank" trend remained, kept alive by a desire not to hamper the mobility of tanks by the attachment of other elements and, partly, by overestimates of the capabilities of the tank on its own.

The Mechanized Force of 1927 certainly served to reinforce the difficulties envisaged in the combination of various arms, though allowance should have been made for the hasty and rather haphazard fusion of its different elements. It consisted of a reconnaissance element of tankettes and armored cars, a battalion of Vickers medium tanks, a motorized machine gun battalion and the equivalent of an artillery battalion—partly towed and partly self-propelled. This

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RICHARD M. OGORKIEWICZ, a frequent contributor to ARMOR, graduated from the Imperial College of Science, London, England, in 1946 and was assigned there as a lecturer. He then held several positions with the Ford Motor Company in England and is presently working on long-term automotive projects with the Rootes Group.



force opened the way for the development of future armored forces but the more immediate effect of its shortcomings was to strengthen the demand that armored forces should be composed largely, if not entirely, of tanks.

Thus, after the Force was broken up in 1928, further experiments which were resumed in 1931 were based on tanks alone. The 1st Tank Brigade, which was formed on a provisional basis in 1931, consisted of one light and three mixed battalions composed of both light and medium ton tanks, and armored development continued on that basis until 1934, when the Brigade was made permanent. In parallel with this, the first British armored force manual, issued in 1929 under the title *Mechanized and Armoured Formations*, spoke in terms of tank brigades as the basic operational armored units.

This concentration on tanks alone certainly speeded up the development of mobile armored technique. But the concentration was in part only possible because the British tank pioneers, in their desire to exploit the newly-found mobility, placed greater emphasis on strategic maneuvering than on tactical performance. In consequence it was possible for the armored forces to revive the mobile roles which horse cavalry could no longer perform. But, through its neglect of tactical realities, and of the need to supplement tanks with other arms, the same development deprived them of much of their potential versatility and usefulness.

The resulting trend toward limited roles for the armored units was further strengthened by the decision to mechanize the cavalry and combine it with the mobile tank units, i.e., those units of the Royal Tank Corps which were not assigned to close infantry support. In fact, in the first Mobile Division, which was proposed in 1935 and which was actually activated in 1938, mechanized cavalry predominated. The Division was looked upon as a successor to the cavalry division and its role was similar to that to which horse cavalry had been reduced toward the end of the 19th century, mainly that of strategic reconnaissance.

The actual organization of the Mobile Division consisted of one tank

brigade with one light and two mixed, light-medium tank battalions, two mechanized cavalry brigades each with three light tank battalions\*, two small artillery regiments and two motorised rifle battalions. With its total of nine tank battalions and some 600 tanks, mainly light, it was a badly balanced organization: there were far too many tank units and far too many light tanks in relation to its size and its other troops.

Some of the shortcomings of the Mobile Division were corrected in 1939, when its name was also changed to that of Armored Division. The new organization comprised only two armored brigades: one, called "light," consisted of three mixed battalions of light and medium tanks; the other, called "heavy," consisted of three medium tank battalions. At the same time, however, the divisional troops were also reduced in strength and concentrated into a Support Group consisting of one rifle battalion, one small artillery regiment and an engineer company. As a result, although the number of tank battalions was reduced from nine to six, the ratio of infantry to tanks became even worse: there was now only one rifle battalion to six tank battalions, in-

\*These units and more recently all tank battalions in the British Army have carried the designation of "regiments" but, for the sake of clarity and consistency, the appropriate U. S. military designations are used here.

stead of the original ratio of 2 to 9.

The proportion of infantry to tanks was improved somewhat in the early part of 1940, when a second rifle battalion and a mixed antitank/anti-aircraft regiment were added to the Support Group. Simultaneously, the distinction between the two armored brigades was abandoned and each was reorganized on the basis of three medium tank battalions.

A far greater change, however, came about in the second half of 1940, after the French campaign. A divisional armored car battalion was added for reconnaissance and the mixed antitank/anti-aircraft regiment was replaced by two separate regiments, one of towed 40mm antitank guns and one of 40mm Bofors anti-aircraft guns. The Support Group lost one of its two rifle battalions but one rifle battalion was added to each armored brigade, so that the total of infantry battalions per division rose to three against six tank battalions.

The lessons of the 1940 French campaign and the example of the victorious German armored divisions went further, however, than an increase in the proportion of the infantry. The pre-war British plans which consigned more tanks to infantry support and envisaged only three armored divisions were drastically revised. The sights were raised to nine armored divisions and the



(U. S. Army)

The German Blitzkrieg across France completely altered British tank formations.





(British Information Service)

In North Africa British Armored Divisions proved themselves as versatile fighting units, from the first Libyan campaign.

long-term plans went even further. And, what was even more important, armored divisions were finally recognized as versatile fighting units and fought as such from the first Libyan campaign of 1940-41 to the battle of El Alamein and the drive to Tunisia in 1942-43.

By this time the organization was even more similar to that of the German armored divisions, as a result of a new organization introduced in 1942. There was still the armored car battalion and one armored brigade organized as before, but the second armored brigade was replaced by a three battalion motorized infantry brigade. The Support Group also disappeared, all the artillery—increased by a second regiment of towed 25 pounders (87.6 mm gun-

howitzers)—being placed under a divisional artillery commander.

As a result of these changes, the number of infantry battalions for the first time exceeded that of tank battalions, as there were now four of the former to three of the latter per division. This increase in the infantry strength was inspired partly by the example of the German armored divisions and partly by the more difficult terrain conditions envisaged in the next theater of operations, *i.e.*, the continent of Europe. The latter consideration, together with improvements in antitank defense and a reaction from the favorable conditions of the Libyan desert produced some weakening of faith in the fighting power of armored divisions. The number of divisions was allowed to

dwindle, from the total of 11 which were actually raised to only five, while the number of armored units for infantry support increased. At the same time the old and once discredited concept of the limited role of armored divisions appeared again. Thus, on the eve of the invasion of Europe, a War Office manual once again proclaimed that armored divisions were only "designed for exploitation."

Actually, once they landed in Normandy, British armored divisions participated effectively in winning the battle, as well as exploiting it subsequently in the drive across France and North East Europe. The only effect of the mistaken theories about the limited role of armor was to handicap the armored divisions by



(British Information Service)

With the end of the North African Campaign and improvement in antitank defense some authorities lost faith in Armor.



the bias in their training toward the limited exploitation role and by the inadequate armament of their tanks designed on the principle of under-gunned mobility.

The 1944-45 organization was basically the same as that introduced in 1942. However, the armored battalion was replaced by an armored reconnaissance battalion of fast "Cromwell" medium tanks and one of the artillery regiments was self-propelled, as was part of the antitank regiment, now equipped with three-inch guns. The same basic organization was retained after the war but again with a number of modifications. The reconnaissance role was again taken over by an armored car battalion and the armored brigade was given a fourth tank battalion; a little later a fourth infantry battalion was added to the truck-borne infantry brigade, thus making a total of five infantry battalions to four tank battalions per division. In addition, both artillery regiments and the antitank regiment were made self-propelled, though subsequently the latter was eliminated and the infantry brigade reverted to a total of three infantry battalions.

A greater change than in the organization took place after the war in outlook. After a period of post-war hesitation British armored divisions were gradually accorded the importance they deserved as the most effective element in ground warfare. In consequence, when, on the outbreak of the Korean War, British forces in Germany were strengthened as three out of the four British divisions there were armored.

The three British armored divisions represented for a time the most effective element of the N.A.T.O. forces facing the Soviet armies—whose most important striking force has always consisted of armored divisions. Nevertheless, by the early '50s the organization of the British armored divisions left a good deal to be desired. For one thing, they had grown large and cumbersome. Their infantry, except for the organic battalion of the armored brigade, was still carried in trucks of indifferent cross country performance and had limited capacity for close cooperation with tanks. And the artillery, with its 87.6mm gun-howitzers, was no longer in keeping with the increased

gun power of the modern tanks.

In view of this, it was natural that a new type of organization should have been introduced in 1955. Under it the size of the division was drastically reduced so that it came to consist of four tank battalions, directly under divisional control, and one battalion each of armored cars, armored infantry, medium artillery and engineers.

Many of the changes introduced with the 1955-56 organization were only to be applauded. They included the overall reduction in size, simplifi-

past 17 years, just as the organization of the 1956 British armored division runs counter to many trends in the evolution of armored forces. Therefore, this policy could only be regarded as regressive and one which is in danger of bringing the armored divisions back to where they started in the '30s. Or even worse, for one of the three British armored divisions in Germany was broken up in 1956 and its tank units dispersed among the infantry, thus putting the clock right back to the days when armor was a mere auxiliary to the infantry!



(U. S. Army)

**While British fought in Korea, three out of four divisions in Germany were armor.**

cation, reduction of headquarters and the replacement of the light artillery by a smaller number of larger caliber units. But this could not be said of the wholesale reduction of the divisional infantry and the return to the "all-tank" ideas. There was now only one infantry battalion to four tank battalions, whereas all experience and logic showed that the ratio should be close to one-to-one.

Even more disturbing has been the tendency to restrict British armored divisions once again to the limited role of exploitation. In fact, the limited role of armored divisions was officially proclaimed in the 1956-57 Army (budget) estimates. This runs counter to all the experience in the employment of armor during the

In the early part of 1957 British armored divisions, as such, disappeared altogether. But so did the infantry divisions. Their place, as the largest permanent units, has been taken respectively by armored and infantry brigade groups.

However, the change has affected armor far less than might at first appear. In fact, the 1957 British armored brigade group differs little from the small 1956 armored division. Basically, it consists of three tank battalions, one armored infantry battalion and one artillery battalion equipped with U. S. self-propelled medium howitzers.

In general, much the same criticism applies to the 1957 British armored brigade group as to its im-



mediate predecessor, both with regard to its organization and its intended method of employment. One can only hope that it represents a passing phase and that it will be replaced soon by an organization more suited to the latest conditions and needs. And, also, that the British Army will revise its recent policies and restore to British armor its rightful place as an effective and versatile component of the ground forces.

### Soviet

The Russians started the development of their large armored units in the early '30s with "all-tank" ideas similar to those with which the British begun and which have reappeared recently in Britain.

At the time, like most others, the Soviet Army was very much under the influence of the original British theories so far as the mobile employment of armor was concerned. It is not surprising, therefore, that the first Soviet large armored units resembled the Tank Brigade of the British Royal Tank Corps, both in their composition, which consisted largely of tanks, and in their role which was that of mechanized strategic cavalry. They were actually called Mechanized Brigades and usually consisted of three battalions of the fast, Christie-type B.T. tanks, to which was added a small infantry-

automatic weapons element and auxiliary units.

Closely behind mechanized brigades came larger armored units, the Mechanized Corps—the first of which, according to Soviet claims, was formed as early as 1932. Such a corps embraced two or three mechanized brigades, each with its 100-odd tanks, together with a motorized infantry brigade and a rather large motorised field artillery regiment. In this form the mechanized corps bore some resemblance to the contemporary German ideas on the organization of armored divisions, ideas which were eventually adopted by most other armies. The Soviet mechanized corps, however, was never the versatile, closely integrated fighting unit of tanks, infantry and artillery which the German Panzer division was; the mechanized brigade, with its preponderance of tanks and its accent on the limited cavalry role, was more typical of the Soviet ideas on the organization and employment of mobile armor.

The relative importance of the mechanized corps—of which there were seven by the end of the decade—was further weakened by the doubts which the Soviet command began to share with others on the eve of World War II. Partly because of wrong deductions drawn from the Spanish Civil War, the Soviet com-

mand lost some of its faith in large armored units and shifted its emphasis to small tank units and infantry support.

It was only after the success of the German Panzer divisions in Poland and in France, in 1939 and 1940, that the Soviet command recognized the error of its ways. The position had to be reconsidered hurriedly and the outcome of it was a far reaching program of reorganization, with the emphasis on armored divisions modelled after the German pattern.

The new armored, or tank, division established in 1940, consisted of two tank regiments, with a total of some 400 B.T.s and the new T34 medium and KV heavy tanks, one motorized (truck-borne) infantry regiment and one artillery regiment. Two tank divisions and a motorized infantry division formed a tank corps, the motorized division being similar in its organization to the tank division but with the position and ratio of tank and infantry units reversed.

Never parsimonious where tanks were concerned and haunted by nightmares of German tank strength, the Soviet command planned to have some 20 tank corps, or 40 to 50 tank divisions by the fall of 1941. These, however, never materialized as planned for the German attack caught the Red armor still in the throes of reorganization. A year earlier, at the time of the Finnish campaign, Soviet armored forces were still organized into mechanized corps and brigades, as well as heavy and medium tank brigades for infantry support, and in 1941 the new tank divisions were only just coming into being.

Apart from anything else, the figure of 40 or 50 tank divisions, which were planned, serves to emphasize the strength of the Soviet armored forces at the time, and, together with the 20-odd thousand tanks which they possessed, makes ridiculous the contemporary German estimate of the total Soviet strength at 46 armored brigades.

Nevertheless, ignorant as they were on the eve of "Operation Barbarossa" of the total Soviet tank strength, of the new divisional organization and of the new T34 and KV tanks, the Germans managed to destroy practically the whole of the Soviet armored forces arrayed against them. In this they were undoubtedly



(Wide World)

Soviets lost some faith in Armor due to wrong deductions from Spanish Civil War





(Aeme)

The German successes in Poland made the Soviets realize that they were wrong.

helped by the hurried organization of the new Soviet armored divisions, as well as by the legacy of the inferior, infantry-support Soviet tank methods and the inept, piecemeal operational handling of their armored forces by the Soviet commanders.

The magnitude of the German success is perhaps best shown by the fact that by the end of the first campaign, in the winter of 1941, the German high command had identified 35 Soviet tank divisions destroyed in action and a further 30 disbanded as a result of heavy losses. At the time there were practically no large Soviet armored units left.

However, the exhaustion of the German forces and the stabilization of the Eastern Front in the winter of 1941-42, gave the Soviet command a chance to raise some more armored units. But the new units were of a different type from their immediate predecessors. They represented, in fact, a return to the earlier brigade basis. No doubt, Soviet commanders were much more capable of handling brigades than the larger and more complicated tank divisions and the brigades were, of course, more in keeping with the much reduced tank resources.

The new tank brigade, as at first reported, had a tank regiment with three small mixed tank battalions, a

motorized infantry-machine gun battalion, a company each of antitank guns and mortars, and small reconnaissance and antiaircraft units. However, most of the brigades used in 1942 and 1943 were smaller still, with only two tank battalions of 23 tanks each, a motorized rifle battalion and some smaller supporting units.

It was only in 1944 that the tank strength of the Soviet brigades began to rise to a more respectable level. The brigades of that period had either three tank battalions each with two 10-tank companies, or two battalions each with three companies, the total in either case being 65 T34 medium tanks. By then also the organic infantry unit had assumed the novel form of a submachine gun battalion.

The operational capabilities of such relatively small units as the Soviet tank brigades were extremely limited and there was little option but to use them for some time in the limited, infantry-support manner. But as time went on their numbers grew: already in the late spring of 1942, some 14 tank brigades were used during the abortive Soviet Kharkov counter-offensive. In 1943 the Germans estimated Soviet armored strength at 138 brigades and by the end of World War II they had identified no less than 258 different tank brigades, including 49 of the Guards.

What they lacked in individual strength and quality, the Soviet tank brigades thus partly made up in quantity. The limited operational capabilities of the individual brigades were further made up by grouping them in larger armored units, the so-called tank and mechanized corps and tank armies. The first of the new-type corps appeared in action in the fall of 1942, during the Stalingrad operations, and marked the beginning of a process of differentiation between the independent tank brigades which were retained mainly for infantry support and those grouped within the framework of corps for mobile operations.

The actual composition of the tank corps varied considerably but generally it was based on three tank brigades and one motorized rifle brigade. At maximum strength, in addition to these the corps also had one reconnaissance battalion, one motorcycle rifle battalion, one or two heavy tank battalions, two assault guns and two towed antitank regiments and a regiment each of antiaircraft guns, mortars and rocket launchers. With all these units and a maximum strength of some 300 tanks the Soviet tank corps corresponded roughly to a Western armored division.

The mechanized corps, on the other hand, was basically a motorized infantry unit, somewhat similar, in principle, to the German Panzer Grenadier division. In other words, it provided the infantry follow-up force for the tank corps, which the ordinary Soviet infantry divisions with their horse traction were unable to provide. The organization of the mechanized corps resembled that of the tank corps but with the position of the tank and infantry units reversed, i.e., with three motorized infantry brigades, each with its own tank battalion, and one tank brigade.

The independent tank brigades were generally similar to those in the tank and mechanized corps and like the latter were chiefly based on the T34 medium tanks, there being a maximum of 107 of these per brigade. However, being principally intended for cooperation with the infantry, they did not have organic infantry units. Apart from these brigades there were also independent heavy tank regiments, with 23 KV or JS (Stalin) tanks each, and independent assault



gun or SU regiments, which were allotted as required for the support of infantry or armor.

By the end of World War II the Soviet armored forces thus consisted of the following four main categories: the tank corps, the mechanized corps, the independent tank brigades and the independent heavy tank and assault gun regiments.

According to some German estimates, there were 25 tank and 13 mechanized corps at the end of the war in Europe, representing over one half of the total Soviet tank strength in the field. Powerful as this force was, it was still small in relation to the mass of the Soviet infantry divisions. It also represented a much smaller overall degree of mechanization than that in the armies of the Western Allies. Or even the German, which made the most of its tanks by grouping practically all of them in its armored divisions.

Also unlike the German, the Soviet operational doctrine was still inclined toward tying tanks down to the pace of the infantry mass. But the increasingly successful employment of armor in more independent roles in the closing stages of World War II encouraged Soviet protagonists of armor as the mobile spearhead of the ground forces.

In the immediate post-war period



(Acme)

Soviet operational doctrine still held Armor down to pace of the Infantry.

Soviet armored forces had to face the additional problem of doubts about their future raised by various new developments in antitank weapons and other fields. In this they were no different from other armored forces. But, unlike U. S. armor which found its strength drastically reduced, the Soviet armored forces emerged in the post-war period not only undimin-

ished in number but, in fact, occupying a far more important position than ever before. Published estimates of the Soviet strength vary somewhat but there seems little doubt that armored units represent about one-third of the Soviet field forces and their most effective, versatile and mobile striking force.

To fit them for this new role the organization of the Soviet armored units was very thoroughly overhauled and they have changed considerably from their war-time predecessors. Divisions have once again been introduced, for instance: shortly after World War II they replaced brigades as the basic armored units and, also, the rather loose corps organization.

As in the case of the earlier divisions and the war-time corps, there are still, however, two types: the tank division with a relatively high proportion of tanks and the mechanized division with a preponderance of infantry. The basis of the former are three medium tank regiments with tanks of the T34/85 or T54 type, one heavy tank-assault gun regiment with Stalin tanks and one rifle regiment. The four tank regiments represent a total of some 300 tanks and SU's and the other units of the tank division include a towed 122mm howitzer regiment, a light antiaircraft regiment, and a regiment each of heavy mortars and rocket launchers;



(Sovfoto)

Soviet Armor increased in importance during the post-World War II period.



there is also a reconnaissance battalion and the usual divisional service units.

The organization of the mechanized division is similar to that of the tank division but, once more, with the position of the medium tank and rifle regiments interchanged. Broadly speaking, the mechanized division stands in much the same relative position to the tank division as the motorized division did to the tank division of 1940, and as the mechanized corps did to the tank corps during World War II.

The need for the mechanized division, however, is less clear than that for its predecessors in view of the increasing motorization of the regular Soviet infantry divisions, which have now dispensed with horse traction. The infantry divisions have also, once again, acquired their own organic tank units, usually in the shape of a regiment of medium tanks with some SU-type vehicles. The new infantry or rifle divisions thus show that the Russians have not abandoned the idea of using a portion of their tank strength for infantry support but in view of the large number of tanks at their disposal this diversion detracts little from the strength of the armored divisions.

It is quite possible that the existence of the two types of Soviet divisions will prove to be only an interim

measure and that the two will, eventually, merge into one as the rifle divisions acquire still more motor transport. But even now, in spite of the different proportions of riflemen and tanks, the Soviet tank and mechanized divisions are very similar.

In principle, they are both closely integrated divisions of tanks and infantry with considerable combat power. In this last respect, demonstrated clearly by the inclusion in the divisions of heavy-gun tanks and powerful assault guns, they are at one with earlier German ideas on the subject and well away from the World War II Anglo-American principles of undergunned mobility.

In trying to assess Soviet armored divisions from other points of view allowances must be made for the smaller size of some Soviet units and the differences in terminology. For instance, a Soviet tank battalion has had only 21 tanks and a three battalion regiment was not much bigger, therefore, than a Western tank battalion. The rifle battalions too have been small. Thus, although the number of units is different, the effective overall ratio of tanks to infantry in the Soviet tank divisions is not much different from that represented by the one tank battalion to one infantry divisions.

In the mechanized divisions the

proportion of infantry, is, of course, higher—about double that in the tank divisions. At that it is similar to the proportion of the two elements with which the German Panzer divisions operated during the latter part of World War II, though as a result of shortages of tanks rather than by design!

In the case of both the Soviet tank and mechanized divisions, however, the degree of integration between tanks and riflemen is close, probably closer and more permanent than has been the case in any other armored divisions. The inclusion of the submachine gun infantry battalion in each medium and heavy tank regiment is somewhat similar to the British practice of having a motor, or armored infantry, battalion in each armored brigade. But in view of the smaller size of the Soviet tank units it represents a higher proportion of infantry within the armored units and a closer tie-up between the two. Similarly, a close degree of integration is met with in the mechanized divisions where each rifle regiment has an organic medium tank battalion, the latter being additional, of course, to the divisional medium and heavy tank regiments.

Apart from their organic infantry battalions, tank regiments have their own assault guns and the rifle regiments have their own guns, mortars and other heavy weapons. With all these means at their disposal the regiments form self-contained battle groups and each division can thus readily operate in four or five such groups, in line with all the latest trends in tactical ideas.

Taken as a whole, the Soviet armored divisions reflect the sound lessons of experience and up-to-date development. First, there is the accent on combat power and on well armed armored vehicles, borne out of the hard school of the Eastern Front and its decisive armored battles. Then there is the close integration of tanks and the supporting riflemen, developed gradually from the days of the original mechanized brigades. Finally, there is the relatively small size of the divisions and their self-contained regimental battle groups, which were borne out of war-time necessity and brought up on a sound assessment of future needs and conditions.



(Sovfoto)

In closing stages of World War II Soviet Armor assumed more independent roles.



*Around the end of the 1940's or the beginning of the 50's the Ordnance Corps turned to industry with a list of areas wherein it felt that further developmental work and/or new products were required. Number one on the list was the increase in fuel economy of all fighting vehicles. Thus, the Ordnance Corps moved into the next phase of its engine program, the refinement of the basic product for maximum effectiveness.*

## FUEL INJECTED ENGINES

By ALEX HOSSACK

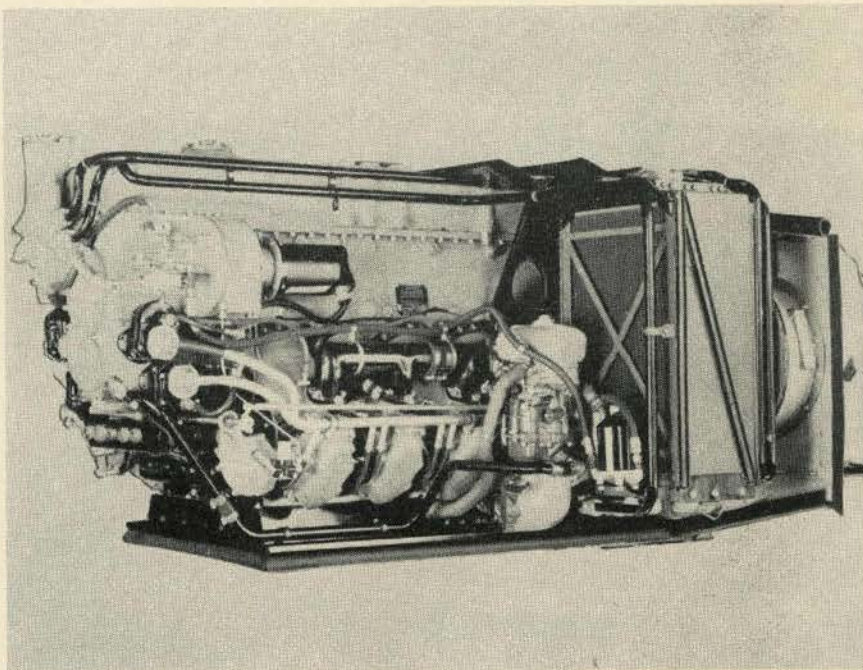
**O**N December 7, 1941 the United States declared war on the axis powers and in so doing was flung headlong into a conflict which extended her armed forces and her supply lines from one end of the earth to the other.

The ensuing logistical problems almost immediately spotlighted countless difficult areas in the system then employed by our Armed Forces in the procurement and maintenance of military supplies. To illustrate this, the United States entered the war with neither a basic military engine design, nor an acceptable commercial substitute with which to power vehicles used in the various facets of spearheading, supporting or maintaining a mechanized armed force abroad. Because there was an extreme need for vehicles of all types, and because time therefor was a most precious commodity, we were forced to adapt for installation any available commercial engine which would fulfill the basic needs. The result of this necessity was a supply problem that can well be imagined, considering that there were air-cooled, water-cooled, and diesel engines all used to propel the same class of vehicles. This fact dictated a base spare parts overstocking situation.

Toward the end of World War II the Ordnance Corps decided to provide for itself an engine specifically designed for its vehicular requirements: providing the maximum power-to-weight ratio, ease of maintenance, interchangeability of parts, covering a range from 100 to 1000 horsepower, minimum size, water-proofed for water submersion and suitable for extremes of arctic and tropical climates. The result of this was an engine design covering the 100 to 1000 horsepower range by utilizing engines of two basic sizes. The smaller engine classification is 4 $\frac{5}{8}$ " bore by 4" stroke giving 67

cubic inches cylinder displacement; and the larger, 5 $\frac{3}{4}$ " bore by 5 $\frac{3}{4}$ " stroke, resulting in 149 cubic inches cylinder displacement. The variation in power output is accomplished by varying the arrangement of these cylinders and in some cases, by supercharging.

The first vehicle to be produced with the new concept engine was the M46 medium tank. Dubbed the "Patton," it was too late for World War II fighting, but saw active duty in the Korean War. This vehicle was powered by a Continental AV-1790-5A engine, a V-12 1790 cubic inch air-cooled 810 gross horsepower en-



(Simmonds Aerocessories Inc.)

Continental AV-1790-5A engine.

**MR. ALEX HOSSACK** has been connected with Army Ordnance since 1950, primarily in the engine and transmission fields. He served as project engineer at Detroit Arsenal and chief project engineer at ALCO Products, Inc. He is presently the engineering manager of the Hydro-Mechanical Department, Simmonds Aerocessories Inc., Tarrytown, New York, which is the principal designer and manufacturer of the fuel injection unit discussed in detail in this article.

ARMOR—January-February, 1958



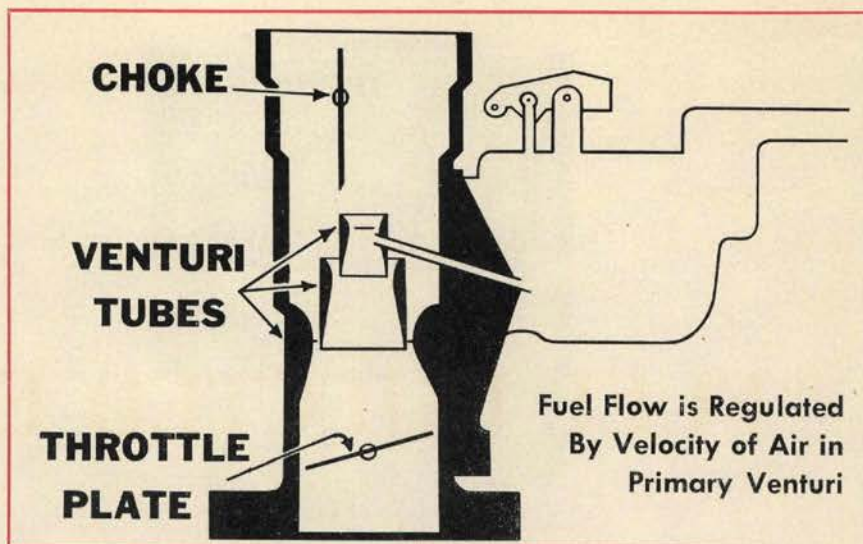
gine. The engine application was gradually extended to cover other vehicles utilizing engines in the two classifications.

Around the end of the 1940's or the beginning of the '50's, the Ordnance Corps turned to industry with a specific list of areas wherein it felt that further developmental work and/or new products were required. Number one on this list was the increase in fuel economy of all fighting vehicles. Thus did the Ordnance Corps move into the next phase of its engine program, the refinement of the basic product to provide the maximum effectiveness.

Slightly earlier than the publication of the above list, Simmonds Aerocessories had negotiated a contract with the SU Carburettor Company, Limited, Birmingham, England for the world's rights, exclusive of the United Kingdom, to a fuel injection system developed by the SU Carburettor Company and used on the Rolls Royce Merlin engine during World War II. After successfully obtaining these rights, Simmonds approached the Continental Aviation and Engineering Corporation, who were engaged in the development of engines to Ordnance specification, to initiate a program applying fuel injection to these engines.

Most people are fairly familiar with engines and have recently been exposed to a great deal of publicized discussion of the merits of fuel injection over carburetion when applied to automobile engines. Being familiar with these discussions, it should be quite plausible, therefore, that carbureting an engine which is designed to meet the requirements specified initially in this article is considerably more difficult than would be experienced in automobile engines.

A carburetor is a device to measure the flow of air being consumed by the engine and to determine and meter out the exact quantity of fuel required for proper combustion. A carburetor is essentially a volumetric device in that it measures volume of air relating it to the pressure drop in a venturi section, and quantitatively adding fuel as a function of this pressure drop. One immediate problem that becomes apparent is the volumetric proportioning of air to fuel. The proper combustible mixture is determined by weight ratios,



(Simmonds Aerocessories Inc.)

Typical automobile carburetor.

and any decrease in the specific weight of air results in poor matching because any quantity of such air will have a smaller absolute weight of oxygen resulting in a rich fuel-air ratio. Standard ambient pressure is used as a reference by the carburetor and a drop in ambient pressure upsets the fuel metering part of the carburetor toward a richer fuel-air ratio. Any increase in barometric pressure causes the fuel-air ratio to move in a leaner direction. These changes frequently occur in normal operation because of a change in weather or altitude.

In combustion, in order to consume the fuel admitted to a cylinder completely, all of the fuel must present the maximum surface area to the air with which it is in contact. This can best be accomplished by breaking the fuel up into the finest possible size droplets. These droplets must be formed at the carburetor, insulated from one another by a cushion of air to prevent them from re-forming into larger droplets, and yet conveyed by a stream of air from the carburetor to the cylinder of the engine. The confines for this conveyance is termed a "Manifold." The manifold must be carefully designed and tested to insure that this charge of air and fuel is evenly divided among the cylinders, that the velocity of the stream is such that the insulating cushion of air is maintained, and further, that it accomplishes all this and still moves the stream through several turns and to near and far cylinders with equal proficiency.

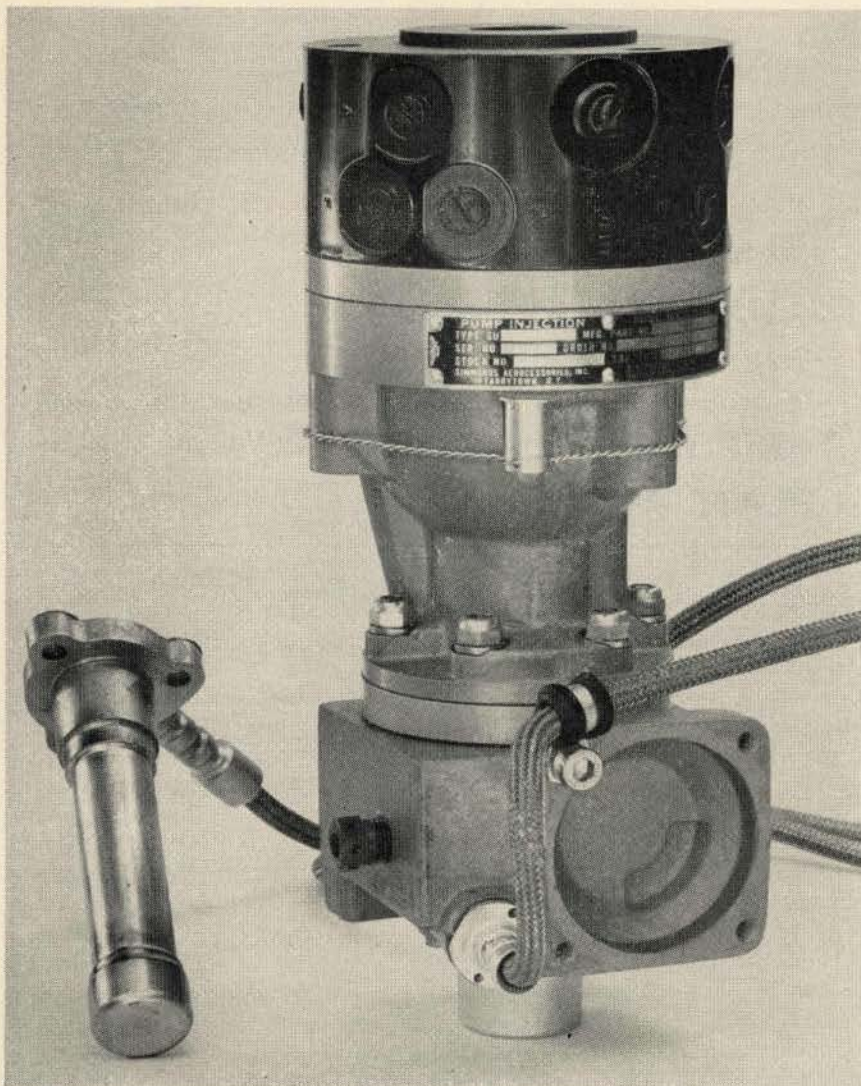
As we have mentioned earlier, this is very difficult to accomplish on automobile engines, but when you consider the complexity of a fighting vehicle's engine compartment, the necessity for accessibility and the requirement for the maximum amount of fuel storage, on Ordnance engines this task becomes almost insurmountable.

In addition to the installation difficulties, the carburetor had some basic deficiencies which could and did present critical field problems. The most serious of these were cold starting and warm-up, and carburetor icing. Either of these was sufficiently grievous to severely delay operations or cancel them entirely.

The Ordnance engines in the late 1940's were equipped with the latest and most effective carbureting aids and devices known. Therefore, it was apparent that the next step to more efficient fuel metering was to replace the carburetor with a device which could handle the fuel metering with greater efficacy. One of the devices which was considered was the Simmonds SU Fuel Injection System.

Fuel injection has become quite topical over the last three years although as a product, it has been in general use in aircraft and specialized applications for many years. The fuel injection system as applied to the Ordnance engine is designed as a multiple point, low pressure, timed, speed density injection system. Multiple point means actually the deliverance of the fuel and the mixing of





(Simmonds Aerocoastal Inc.)  
Simmonds SU Fuel Injection Pump.

the fuel with air at each cylinder. Low pressure is derived from the fact that fuel is injected into the manifold rather than into the combustion chamber as with high pressure systems. Timed injection is opposed to the continuous flow systems and indicates that injection takes place over a narrow range of crankshaft revolutions and is related in some manner to the air induction cycle. Speed density control describes the means of determining engine fuel requirements. The density of the air in the manifold and the speed of the engine are used to define the quantity of fuel to be injected.

The Simmonds SU Fuel Injection System can be considered composed of three elements:

1. The control system,
2. The metering system, and

### 3. The distributing system.

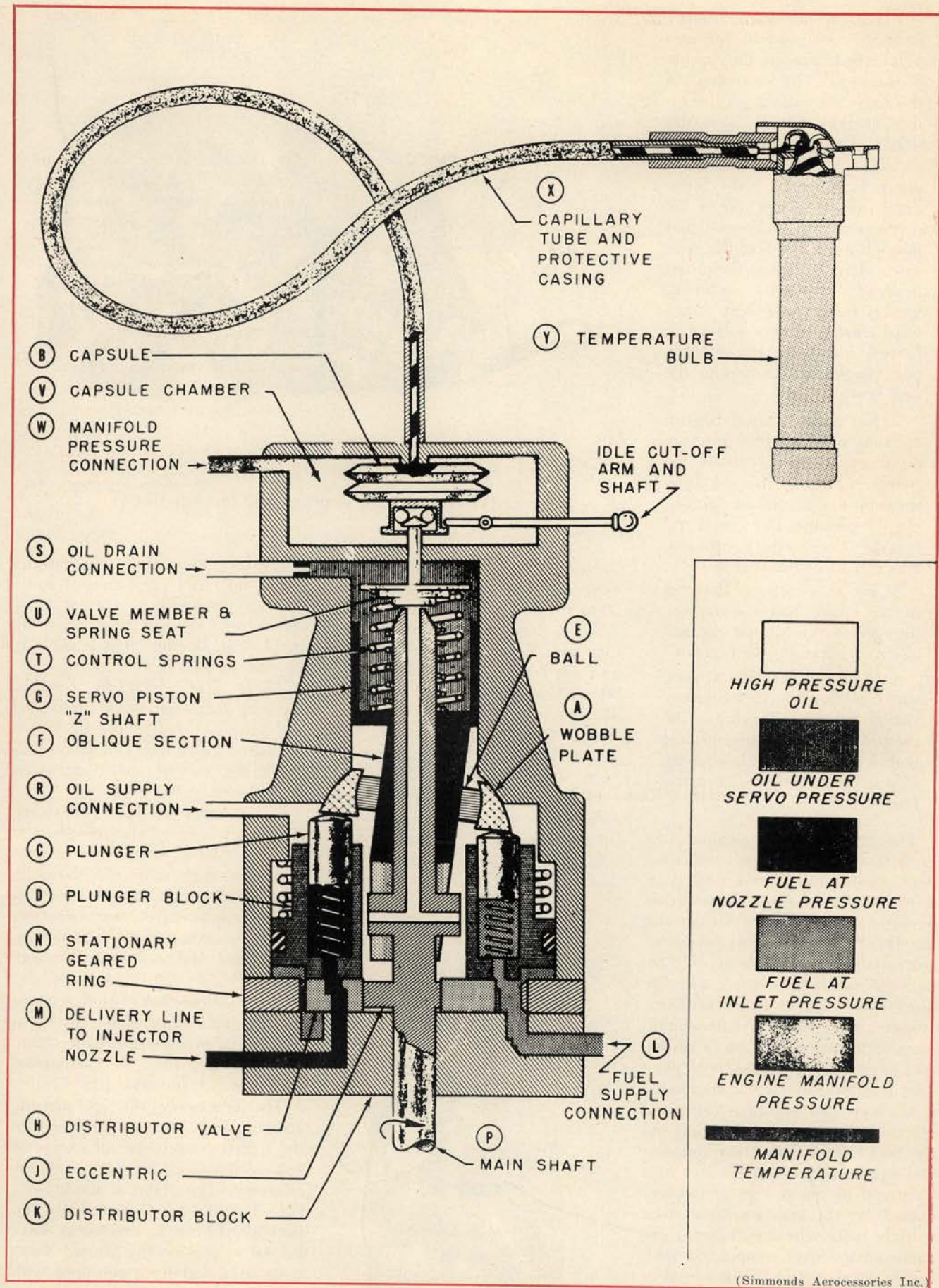
The control system is a servo system which uses a combination of manifold pressure and temperature for an input signal, and oil pressure for power. This is achieved by exposing a nitrogen-filled capsule to manifold pressure. The nitrogen is confined to the capsule and connected to a bulb by means of a capillary tube. The bulb is placed in the air induction system and senses air induction temperature. The capsule then, assumes a position in response to the pressure differential created by the sensing of the temperature and pressure of the air in the intake manifold. The capsule is connected to a valve member which responds to the capsule setting by creating an orifice between the valve and the mainshaft which in turn establishes an oil flow from the

oil supply side of the z-shaft to the servo side of the z-shaft. The servo side is drained by a fixed orifice path. The resulting pressure differential occurring across a piston moves it to a calibrated position. The metering system consists of a multi-cylinder wobble plate pump whose stroke is varied by translation of the z-shaft. The wobble plate oscillates in a spherical seat and is wedged to the z-shaft by a wedding ring. The wobble plate assumes an angle with respect to the mainshaft in direct proportion to the displacement of the center of the z-shaft and wedding ring contact from the center of the mainshaft. This angle directly changes the magnitude of the stroke and consequently the flow of fuel. The distributing system consists of a stationary gear ring inside of which there is a rotating distributor valve geared to a gear ring in the ratio of 8 to 9. The distributor valve is actuated by a cam on the mainshaft. The resulting hypotrochoid path is used to provide juxtaposition of the proper plunger, a port in the valve and an outlet on the distributor block. This alignment is designed to take place at a point where the rotational velocity of the distributor valve port is at a minimum. The injection takes place during 180 degrees crankshaft and is timed to initiate at the beginning of the air induction cycle.

The pump itself is driven at engine speed, and therefore half as many plungers as engine cylinders are required with a given plunger injecting into one cylinder on one revolution and into another cylinder 360 crank degrees later.

The flow from the individual outlet port is conveyed through piping to a nozzle placed in the intake manifold in the proximity of the intake valve. The nozzle consists of a filtering element and a spring loaded valve, the valve being calibrated to open when the pressure rises to approximately 65 psi. The line length is immaterial, and since the nozzles are not a part of the metering system, they need not be matched. Their prime function is to contribute towards a satisfactory spray pattern during injection and to maintain a full fuel line between injection periods and during shutdown. The fuel injection unit responds to a change in engine conditions in the following manner:





(Simmonds Aeroaccessories Inc.)

A schematic diagram of the fuel injection system.



1. For an increasing throttle opening the manifold pressure will increase causing the capsule to compress. The movement of the capsule creates a greater orifice at the end of the mainshaft and increases the flow from the oil supply side of the servopiston to the servo side. Since drain from the servo side of the servo piston is accomplished through a fixed orifice, the pressure differential across the piston decreases and the metering springs force the z-shaft downward creating a new balance of forces, increasing the wobble plate angle and increasing the fuel flow.

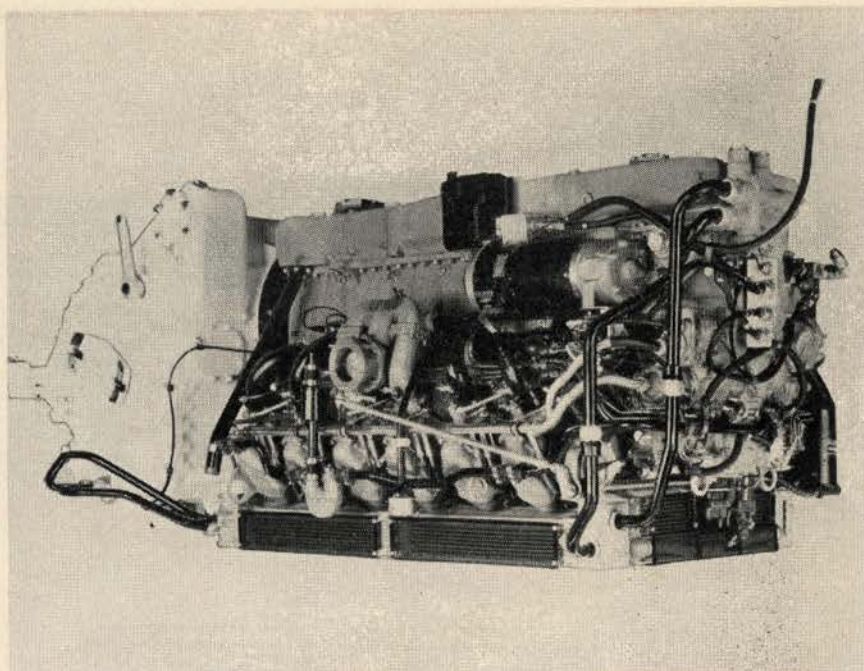
2. For a decreasing throttle opening the manifold pressure decreases, and the capsule expands reducing the oil flow through the mainshaft increasing the pressure differential and forcing the z-shaft upward, which reduces the fuel flow.

3. For an increase or decrease in air intake temperature, the nitrogen in the capsule expands or contracts varying the fuel flow.

4. A change in ambient pressure conditions causes a response similar to opening or closing the throttle and any variation of load with a constant throttle opening is sensed by variations in manifold pressure.

The testing and evaluation program resulting between Simmonds Aerocessories and Continental Aviation and Engineering Corporation provided a total of 20,000 hours of bench testing including numerous accelerated endurance tests, 75,000 miles of vehicle operation, and approximately 30,000 hours of dynamometer operation. These tests, in all cases, indicated a satisfactory accomplishment of the initial objectives. The fuel/air ratio was considerably lower and narrower than the ratios required for a carbureted engine and the brake specific fuel consumption was significantly reduced.

Several of the test programs conducted by the military have been vehicle tests where carbureted engines ran in direct competition with fuel injected engines. Tests varied in their results depending on the type of operation and the time of year that



(Simmonds Aerocessories Inc.)

**AVI-1790-8 Engine equipped with fuel injection.**

the tests were conducted; however, in most cases, economy improvements of 20 to 35% were realized.

Among the fuel injected engines that have been built, the most current are being used in the M48A2, 90mm Gun Tank; the M42, Twin 40mm Gun Motor Carriage; the M41, 76mm Gun Tank; the T51 Heavy Recovery Vehicle; and the M56, 90mm Self-propelled Antitank.

One aspect of fuel injection versus carburetion that has not been considered prior to this is the effectiveness of field control and servicing. The fuel injection system described

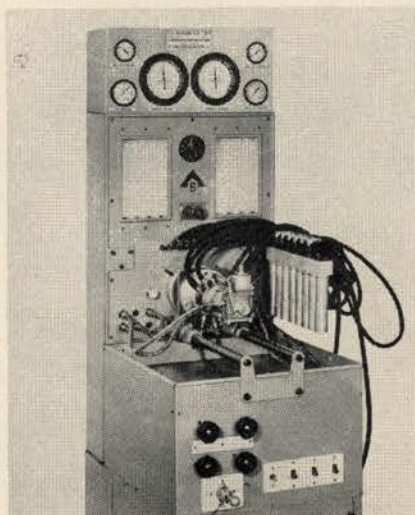
heretofore operates using engine speed, manifold pressure and manifold air temperature as a means of determining air flow. Since these are simply reproducible, it is possible to provide a means of field testing.

There is a lightweight, portable, accurate field test stand developed and manufactured by the Bacharach Industrial Instrument Company. This unit is designed to provide all aspects of field testing.

In this article we have endeavored to present some of the reasons why we feel fuel injection has a great deal of satisfaction to offer the using units. In essence, it is a valuable adjunct to the present Ordnance engine policy, extending itself from both an operational and maintenance standpoint.

The incorporation of fuel injection has been accomplished at a cost equal to and in a number of instances, considerably less than the carbureted version which preceded it.

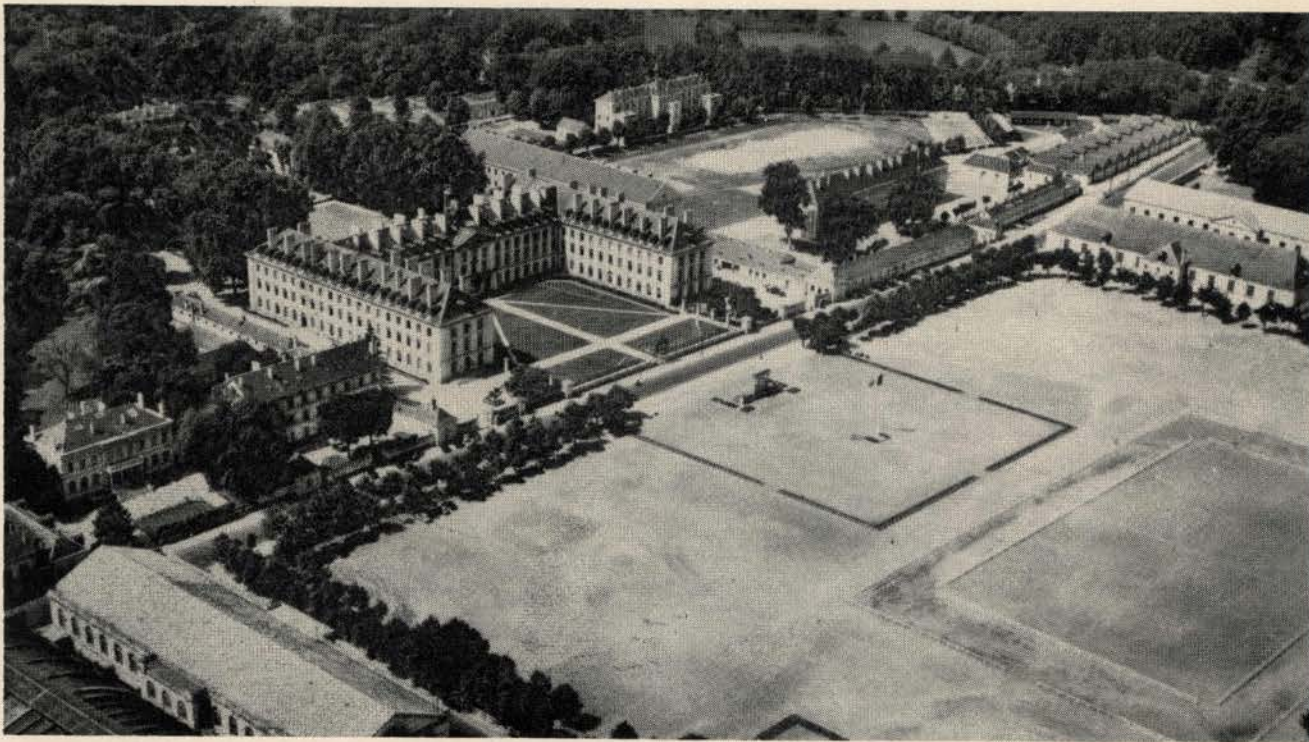
The most noteworthy and immediately apparent improvements are that the effective range of all classes of vehicles has been increased, and the all-weather operability of the fighting vehicle has been successfully improved. These achievements have helped to provide the United States with an armed force equipped with vehicles of greater efficiency and superiority.



(Simmonds Aerocessories Inc.)

**Fuel injection test stand.**





# SAUMUR

## The French Armor and Cavalry School

By MAJOR QUINTUS C. ATKINSON and LIEUTENANT COLONEL CARROLL McFALLS, JR.

**T**HE headwaters of the Loire River rise in southern France in the Haute Loire Department and, like all the major roads and railroads of France, and a large percentage of the tourists of the world, immediately head for Paris. Near Orleans the river develops a mind of its own, however, and changes its course. Unwilling to compete with the fabulous Seine, *The river of France*, the Loire abandons its north-

ward direction and, describing a gentle curve with Orleans as the apex, it flows south and west, emptying into the Atlantic at Nantes. Although the Loire never sees the famous landmarks of Paris and has never become the subject of world-famous songs, as has the Seine, it is famous in its own right. For the Loire flows through the Loire Valley whose scenic beauty is such that it has been used for centuries by the nobility of France as the site of their beautiful country palaces, the famous French chateaux. In fact, the Loire Valley is known as the "Chateau Country." As the Loire swings deeper into western France, it adds further distinction to its name as it flows through Saumur, a French city located between Tours and Angers; for Saumur is the site of the storied French Armor School, or, to

give it its correct French title, The School of Application of Armor and Cavalry.

Saumur! What memories the name evokes in the minds of those members of the arm of decision in all the armies of the West who still remember the day when the horse was the means of mobility for that arm and the saber its cutting edge. For Saumur is one of the oldest, if not in fact the oldest, existent Cavalry School in

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**MAJOR QUINTUS C. ATKINSON**, Armor, graduated from West Point in 1943. During World War II, he served in Europe in the 610th Tank Destroyer Battalion. Subsequently he commanded a Company in the 3d Armored Cavalry Regiment. Next he attended the Advanced Class at Fort Knox and C&GSC at Fort Leavenworth. He was next assigned as the Armor advisor at The French Armor and Cavalry School. He is now an instructor at The Command and General Staff College.

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**LIEUTENANT COLONEL CARROLL McFALLS, JR.**, Armor, commissioned from OCS served in Europe during World War II in the 3d Infantry Division. Afterward he instructed at Fort Benning, attended the Armor School, then commanded the 70th Tank Battalion in Korea. Returning Stateside he attended C&GSC and was assigned as Executive Officer, later Chief, of the Combat Vehicle Section at the Armor Board. He is Chief, Operations Unit, Army Section, MAAG, France.



the world. It is interesting to note that, although Saumur is actually a city, the fame of the school is such that most people, and especially military people, think of Saumur as a school, similar to the manner in which West Point is identified as The United States Military Academy rather than the place where the Academy is located. Saumur, the school, was born in the 15th Century with the establishment of a school of equitation and with few interruptions there has been some form of school in existence ever since. In 1763 the first purely military school was established with the arrival of the Brigade of Carabiniers of the Court of Provence. This school for carabiniers—or mounted riflemen—continued until the Revolution. In 1814 Marshal Soult ordered the re-establishment at Saumur of a "school for the instruction of mounted troops," and it is from this period that the present black uniform of the *Cadre Noir* is dated. (The *Cadre Noir*, or Black Cadre, is a group normally consisting of eight officers and four non-commissioned officers who are specially selected from the French Army for their superior horsemanship. This group provides the instructors for the equestrian course which is still taught at the school. Members of the *Cadre Noir* are assigned to the school for a four-year tour, after which they return to their parent unit.) By 1822 Saumur was well established as the French Cavalry School and has continued to this date, although interrupted during both World Wars. During the period 1822 to 1940 Saumur became world famous as a center of cavalry training and equestrian activity. Such famous *Ecuyers*—or riding masters—as Cordier, L'Hotte, Danloux and Lesage made French horsemanship known and admired throughout the world. This tradition is carried on today by Lieutenant Colonel Margot, the present Chief Riding Master. During this period many foreign cavalry officers, including many from the United States, received training at Saumur. Among them was Lieutenant George S. Patton, Jr., who was a student in 1911-1912. A plaque in the Court of Honor of the school commemorates the attendance at the school of General Patton and of the later contribution of his Third Army to the liberation of France.



Brigadier General de Clerck, the Commandant of the French Armor School.

During World War I the United States Army had intimate contact with Saumur for in 1918 a portion of the school and the gunnery ranges at nearby Fontevault were loaned to the AEF for use as an American artillery school. The short stay of students and instructors must have been quite pleasant, for it is not at all uncommon for an American "tourist" to arrive at Saumur to show his wife

the "old school" he attended as a young soldier.

As early as 1918 instruction in mechanization was making an appearance in the curriculum of Saumur with the organization of an armored car school in that year. By 1928 Saumur had become the branch school for both Cavalry and the *Train*—the latter being the forerunner of the present French Transportation



Plaque to General Patton in the Court of Honor of the French Armor School.





Panhard Armored Cars, manned by students, on maneuvers near the School.

Corps. This organization continued until 1940 when war once again disrupted the school.

In 1940 the school added an unusual and heroic page to its long history when Saumur became a battlefield. Ordered to withdraw in the face of the relentless German advance on the Loire, the then School Commandant, Colonel Michon, demurred. He requested that the school be given a defensive sector along the river line rather than withdrawing. His request was granted. With approximately 1,500 instructors and students and an additional mixed force numbering approximately 700, the school fought a valiant but hopeless battle against tremendous odds from the 19th through the 21st of June. With neither artillery nor air support and with only ten old instructional tanks, this small force valiantly defended 24 miles of river line until overwhelmed by superior forces. This courageous action was recognized by their opponents who christened them in official orders, "The Valiant Cadets of Saumur." After the armistice Saumur became a part of the occupied zone of France and the school was

closed. Armor instruction was continued, however, in Tarbes, a city near the border between France and Spain.

In 1945 the present school was established. It combined the functions of both the old Cavalry School of Saumur and the Infantry Tank School of Versailles. Today, under the command of Brigadier General de Clerck, Saumur is the Fort Knox of the French Army; the branch school for armor instruction. The school is under the G3 of the French General Staff for operations and under the Inspector General of Armor for tactical training directives, and in many ways is organized similarly to The Armor School at Fort Knox.

The main course of instruction at the school is the Basic Armor Course. This course is pursued by graduates from the French Military Academy who have entered the Armor and Cavalry Branch of the French Army. (Note: The French Armor and Cavalry Branch is a single branch and corresponds to the Armor Branch of the United States Army.) This course is of nine months' duration and is similar in scope to the Regular Basic

Course at Fort Knox, with one interesting exception. This exception is the fact that all students are required to take equitation. This equitation course is used as a means for the development in the young officer of a sense of self-confidence, an aggressive spirit and a taste for risk. It also helps to instill the "Cavalry Spirit," a term much heard in the French armor forces and which in its simplest form means a deep pride in the responsibilities and capabilities of the mounted soldier. An important by-product of this equitation course is excellent physical condition. It is interesting to note that a "bay window" is rarely found among officers of the Armor and Cavalry Branch and that most officers continue to ride horseback throughout their careers.

Saumur also offers a *Cours Inter-Armes*, or Combined Arms Course. This course is similar to the Advanced Course conducted at Fort Knox. It is attended by selected captains and senior lieutenants of all the combat arms and is of five months' duration. Equitation is not a prescribed subject, but is strongly encouraged by the school on a voluntary basis.

A third course offered is the Officer Candidate Course of five months' duration. Upon successful completion, graduates are commissioned as Second Lieutenants or *Aspirants* of the reserve. They then join an active regiment and complete their active service. (An *Aspirant* is a temporary rank peculiar to the French Army. It is not actually a grade, although an *Aspirant* ranks between the senior noncommissioned grade and that of Second Lieutenant. It literally means a soldier who is waiting to be promoted to be an officer; i.e., he is aspiring to officer rank. Normally an *Aspirant* is promoted to Second Lieutenant after serving six months as an *Aspirant*. However, if his service has not been satisfactory, he may revert to his enlisted rank.)

As in all French service schools, there is also a course at Saumur for the *Anciens Enfants de Troupe*—the Former Children of the Troops. The *Anciens Enfants de Troupe* are the sons of Frenchmen who have completed their military service, the sons of regular army officers or enlisted men, or the sons of French officers or enlisted men who were killed in action. They are enrolled in the ranks



of the *Enfants* by their parents and their schooling is then the responsibility of the Government. They pursue a general education course, with some military subjects included, until they are 17 or 18 years of age. They are then enrolled in a service school, such as Saumur, for a military training course. After approximately ten and one-half months of instruction and upon graduation they may either enter the French Military Academy, providing they pass the entrance examination, or they may enter the regular army as noncommissioned officers.

Unlike Fort Knox there are comparatively few courses for enlisted men offered at Saumur. Most of the training of enlisted specialists in the French Army is conducted at unit level. Certain technical courses, however, are given at Saumur. Among these are the Armored Non-Commissioned Officers Specialist Course; the Tank-Automotive Electrician, Welder and Metal Workers Course; and the Tank-Automotive Maintenance Course. The total output of the courses for enlisted men at Saumur is approximately 250 per year.

A department which corresponds to the Non-Resident Instruction Department at Fort Knox is a part of the school at Saumur. This department prepares and distributes correspondence courses for reserve Armor and Cavalry officers. The department also publishes school manuals and a monthly information bulletin which receives Army-wide distribution. In addition, the department is responsible for the conduct of refresher courses for reserve officers. These courses are a mandatory promotion requirement for all officers of the reserve.

Instruction in weapons, automotive and tank maintenance, and signal communication is the responsibility of three technical departments, organized in a manner similar to those at Fort Knox.

All tactical instruction at Saumur is the responsibility of the Tactical Instruction Department whose functions correspond to those of the Command and Staff Department of the U.S. Army Armor School. Tactical instruction is completely modern and includes the tactical use of nuclear weapons and guided missiles. Because

of a severe shortage of suitable terrain in and near Saumur, the majority of tactical exercises are conducted as map maneuvers or through use of the Tactical Center, an elaborate terrain board which allows the realistic conduct of exercises. The students of the Basic and Advanced Courses spend one month of their course time in the Munsingen maneuver area in Germany. They are attached to an active unit on actual field maneuvers for this period and receive invaluable practical training.

One department of Saumur which is not to be found at Fort Knox is the Foreign Language Department. Each regular officer student must take Arabic and may elect to take another language. Currently, instruction in Arabic, Russian, English and German are offered by the department.

All departments of the school are under the direct supervision of a Director of Instruction. The total annual student output of the school is approximately 1,500. Because of this small number the school is able to organize all classes into student "brigades" of approximately 25 men each. A faculty officer is appointed to supervise each brigade during the entire course of instruction. This faculty supervisor is also the instructor for his brigade for all non-technical subjects and for most of their field training. Additionally, he is responsible for their discipline; a part of their administration; and most important, for the continuing evaluation of each student. This close relationship between student and the faculty supervisor-instructor permits a much better overall evaluation of the student than is possible by means of examinations only. Technical subjects at the school are taught using the committee system of instruction. Thus the teaching method at Saumur is a combined committee and individual instruction system.

Since practical training areas are minimal the school has only a small school troops complement. This consists of the 1st Regiment of Dragoons (a French Armor and Cavalry Regiment is equivalent to a U. S. Armor Battalion). This regiment is equipped with armored cars and with light and medium tanks. No armored infantry or artillery troops are present at the school since school training in these branches of the French Army is con-



An AMX light tank, manned by students, cooperating with a Djinn Helicopter.



ducted by the Infantry and Artillery Schools.

French armor is divided into two general classes. These classes are known as Light Armored Cavalry and as Battle Tank. The former classification includes all reconnaissance and light tank units. These units are equipped with either the Panhard armored car, the U. S. M24 light tank or the French-designed and produced 13-ton AMX light tank. The Battle Tank classification includes all medium and heavy tank units. Currently, there is no heavy tank in service in the French Army. Medium tank units are equipped with US M4 or M47 tanks. Armor instruction at Saumur is designed to prepare the basic student for service in any type of armor unit and to prepare the advanced student for service in either an armor formation or a formation of combined arms. Officer candidates, however, are trained for service in either Light Armored Cavalry or Battle Tank units since the relatively short length of their course does not permit complete instruction in both categories.

Western Europe, especially France, is a heavily built-up area. Virtually

All photographs are through the courtesy of the School—Ecole d'Application de l'Armée et de la Cavalerie, except the photograph on this page which is properly credited. Editor.

all accessible land is highly cultivated. Adequate training areas, especially for armor units, is a major problem. This problem is acute at Saumur because of the rich lands of the Loire Valley. With the advent of the high velocity tank gun, Saumur's nearby ranges can no longer be used for full caliber tank gunnery. The school therefore maintains ranges on the Quiberon peninsula in Brittany and at Camp Mailly, in northeastern France. Thus, a French student must travel approximately 800 miles to complete all phases of tank gunnery, an expensive and time-consuming procedure. The tank park, driving ranges and a very small maneuver area are

located at Fontevault which is 12 miles from Saumur. Small scale training exercises are conducted in this area. As mentioned earlier in this article, large unit maneuvers are conducted at Munsingen, in Germany.

French Armor, as with U. S. Armor, is a continuation of the Cavalry arm. To a much greater degree than in the U. S. Armor, the spirit and traditions of cavalry are kept alive in French Armor. Most of their armor units are hundreds of years old and their battle honors include all the wars in which France has been engaged. Saumur contributes to the maintenance of this spirit in many ways. Among them are the instruction in equitation, already mentioned; their Hall of Honor which includes cavalry uniforms, arms and equipment of various periods of French history as well as paintings, photographs and souvenirs of famous French cavalry officers and battles; their horse shows; and their many colorful ceremonies of which the most moving is the Presentation of Sabers. This ceremony occurs at the end of the Basic Course. The graduates are formed in the Court of Honor on a selected night. By candlelight the young officers kneel in front of their faculty supervisor with their sabers and scabbards crossed on the ground before them. The supervisor with drawn saber stands before each young officer and at a signaled moment, as in the bygone days of chivalry and knighthood, dubs him on the shoulder. The young officer then rises and carries his own saber symbolic of his new responsibilities as an officer and of his entrance into the ranks of the French Armor and Cavalry Branch. One who has experienced or witnessed this impressive ceremony never forgets the moment for invariably one's thoughts turn to the illustrious names of officers, troopers and formations which roll from out of the past and which were borne by men who chose to serve in the storied ranks of the combat arm of decision; in the ranks of mounted soldiery.

Thus does Saumur blend the old traditions with modern instruction to produce trained officers for their Armor and Cavalry Branch who are technically and tactically proficient in modern warfare and who are imbued with the *Esprit Cavalier*—the Spirit of the Cavalryman.



(Service Cinema des Armees)

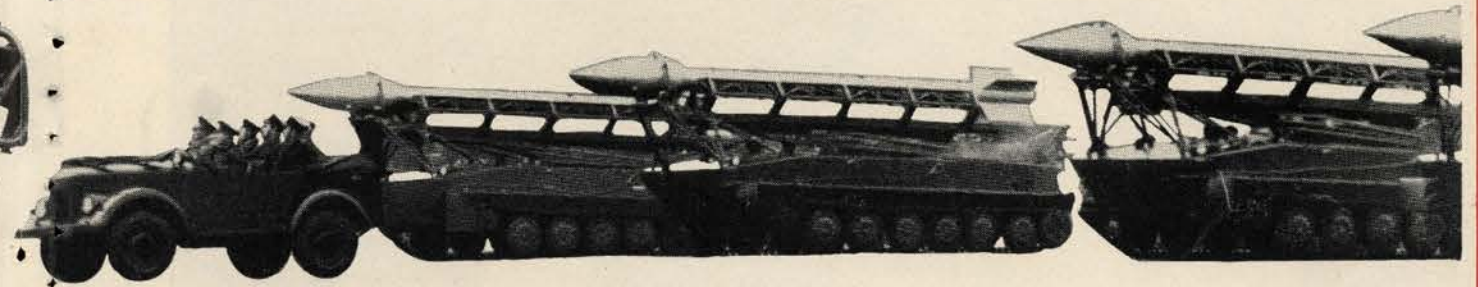
The Presentation of Sabers ceremony during Basic Class graduation at Saumur.



# NEW SOVIET EQUIPMENT



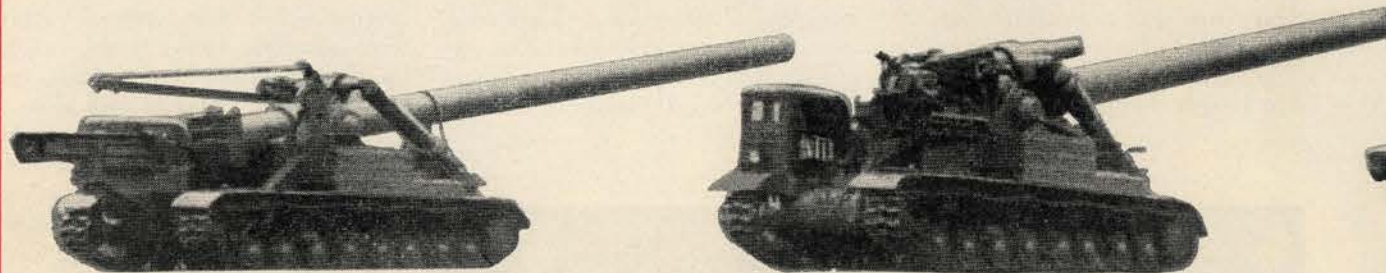
▲ Surface to surface missiles similar to the Corporal.



▲ Surface to surface missiles similar to the Honest John.



▲ Surface to surface missile similar to the Redstone.



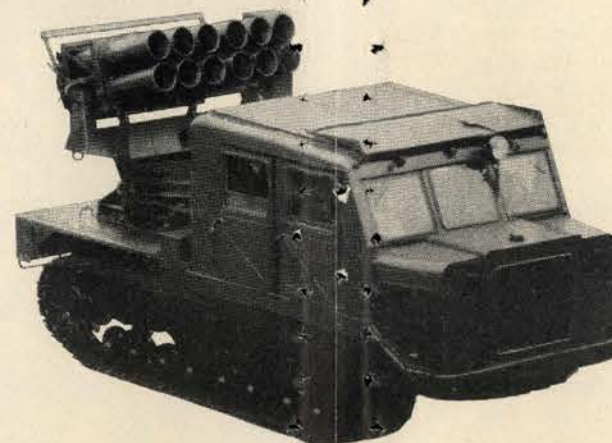
▲ Two new super heavy long-range self-propelled guns approximately 12" each.



▲ The new amphibious APC. Its carrying capacity is approximately 15 men.



▲ A twin 57mm self-propelled antiaircraft full-tracked vehicle.



▲ A 12-tube rocket launcher, approximate size 10" each, on full tracked vehicle.



▲ The new heavy tank, with 122mm gun, which supersedes the JS3.





(U. S. Army)

## ARMOR IN NIGHT OPERATIONS

*True battlefield mobility demands twenty-four hour operation in order to exploit one of the most precious commodities of war—namely, time.*

By COLONEL ROBERT E. O'BRIEN, JR.

**I**N April, 1957, the United States Army Antiaircraft Artillery and Tank Training Center conducted a troop test "Armor in Night Fighting," which is expected to contribute significantly to the development of tactical doctrine for

Armor in night operations. The contribution comes at a critical time, when more and more emphasis is being placed upon the necessity and desirability of fighting at night, and questions are arising as to the effectiveness of Armor to so operate. Test results should provide useful data in formulating tactical doctrine for night operations by Armor and reveal a capability of Armor to exploit its inherent power to a greater extent than provided for by present doctrine.

First, a word about the testing agency is in order, for it is the newest of the centers for Armor activities, and one that is growing rapidly in importance with respect to Armor ac-

tivities. The United States Army Antiaircraft Artillery and Tank Training Center is located at Fort Stewart, Georgia, 40 miles southwest of Savannah. Its great asset for Armor training derives from its huge size, 280,000 acres, which permits the firing of Armor's largest guns concurrently with antiaircraft firing, and plenty of room for movement. Formerly known as Camp Stewart, the installation was declared a permanent one in 1956 and is now receiving the benefits of permanent construction. Its value to Armor will undoubtedly increase as the need for greater firing space increases. The center is the home of the 17th Armor Group. The principal

**COLONEL ROBERT E. O'BRIEN, JR.**, Armor, a 1936 USMA graduate, has written for ARMOR for the past several years. During World War II he served in Europe commanding the 38th Reconnaissance Squadron. Subsequent to the War he held important assignments at AGF and D/A. Attending C&GSC he was the military attache to Rumania. Returning Stateside he was assigned to The US Army Armor Center, next was the G3 at Fort Stewart, which included the period of these tests. He is presently the PMS&T at New Mexico Military Institute, Roswell, New Mexico.



role of the center is the training of various tank and armored cavalry battalions which are sent to Fort Stewart for qualification firing and combat tactical firing exercises. The center is commanded by Brigadier General Paul R. Weyrauch.

The Troop Test "Armor in Night Fighting," as prescribed by Headquarters, United States Army Continental Army Command, consisted of 21 individual tests, of which seven were firing tests, two driving tests and 12 tactical tests. The test unit consisted of the 44th Tank Battalion, reinforced by an infantry company, field artillery battery, engineer company, 4.2" mortar platoon and a 60-inch searchlight platoon (provisional). All of the above units except for the provisional searchlight platoon were from the 82d Airborne Division. Special equipment consisted of six 60-inch searchlights, two 18-inch tank-mounted searchlights per tank platoon (24 in all) and an M6 compass mounted on each tank.

Eleven test objectives were prescribed, dealing with gunnery, fire control, night driving and firing devices, tactical control, use of artificial illumination, formations, susceptibility of vehicles to infra-red detection, necessary changes to doctrine and literature and the need for additional equipment. Space does not permit describing the results of all eleven test objectives, nor of a full and detailed description of the manner in which the test was conducted. Moreover, the excellent article by Lieutenant Colonel Kobbe, "24 Hour Firepower," in the September-October issue of *ARMOR*, treats the subject of gunnery and allied matters thoroughly and in a most interesting manner. Consequently, this article will concern itself with what are considered the most significant test results in the tactical phase of the test.

The individual tests composing the tactical phase consisted of the following exercises:

1. An exercise in which three tank-infantry teams attacked in succession, each under varied restrictions as to the use of radio.
2. A tank-infantry team exercise to test various means of identifying a line of departure.
3. An exercise in which three tank-infantry teams attacked an objective in succession, each us-

ing different means of artificial illumination, namely, 60-inch searchlights, 18-inch searchlights, and illuminating ammunition and aircraft flares.

4. The battalion task force in a preplanned attack.

5. The battalion task force in an attack, not preplanned, in which prior reconnaissance forward of the line of departure was denied.

6. The battalion task force in the exploitation and pursuit.

7. The strongpoint in mobile defense.

8. The task force in a delaying action.

9. The three remaining tests of the eleven in the tactical phase were conducted concurrently with the foregoing, and dealt with control, formations and the effect of nuclear weapons at night.

Observations upon which test results were based were taken from all the foregoing exercises, and represented a distillation of the lessons learned in each. The foregoing description of the conduct of the test has been presented in barest outline in order that we may more quickly examine the test results.

The first consideration with regard to armor night operations is the general one of just how feasible and effective are night attacks by Armor. Advantages derive from several sources, namely: the cover of darkness which permits the advance of the attacker under less effective enemy fire, an advantage of particular application to armor formations due to their relative invulnerability to unobserved artillery fire; the surprise effect derived from the capability of making much of the attack, particularly before the line of departure is crossed, unobserved and undetected; and finally, the strong psychological effect created by advance of tanks which cannot be seen or fired upon. Disadvantages stem from the less effective fire support at night, the difficulties of control and maintenance of direction at night, and the greater risks resulting from moving forward in the face of less adequate reconnaissance. These advantages and disadvantages are based on conditions of darkness without artificial illumination, which brings us to the impor-

tance of the latter, for the advantages are largely negated if the defender employs artificial illumination effectively, and the disadvantages can be largely negated if the attacker does so. Thus, the manner of employment of artificial illumination is one of the most important factors, if not the key factor, in successful night operation. To be sure, black-out attacks have their place and will often succeed, for there is no "always" or "never" in armor tactics, but as a general rule, it was reported in test results that artificial illumination should normally be employed in both the attack and defense, in the manner, and for the reasons outlined below.

First, a brief review of the types of artificial illumination should be helpful to the reader.

The characteristics of the 60-inch searchlight are described in detail in FM 6-115, *The Field Artillery Searchlight Battery*. The 60-inch searchlight, when used in a direct illumination role, casts a brilliant, focused beam which illuminates objects within effective tank gun range almost as well as daylight. When used in the indirect role, that is, with a spread beam from a defilade position, the searchlight provides a diffused light equivalent to a half or quarter moon. The subject of searchlight illumination is a complex one, and the foregoing characteristics as described verge on being oversimplified. However, they are regarded as sound for the purpose of orienting the reader on the light.

There is no official publication extant describing the 18-inch tank-mounted searchlight, but the Draft Manual "The Employment of 18-inch Tank-Mounted Searchlights" does the job very well, if the reader can find a copy. Also, "24 Hour Firepower" by Lieutenant Colonel Kobbe in the September-October issue of *ARMOR* describes the light very well. This light can be used only as a focused beam in the direct role. It illuminates objects at 1500 yards so that they can be successfully engaged by tank gun fire.

Illuminating shells and aircraft flares are described in Training Circular 30 dated 20 August 1952. Illumination by 4.2-inch mortar and 105mm howitzer illuminating ammunition is approximately the same, depending on the model of the round.





(U. S. Army)

**This is one of the two truck-mounted 60-inch searchlights that were used in the test. This light can be operational in 30 seconds from the time vehicle stops.**

The light is bright enough by which to engage targets within a cone of 600-800 yards diameter under a single flare, gradually diminishing beyond the cone of bright illumination. This method of illumination has the great advantage, as compared to the searchlight, of not disclosing the original light source, which of course is the piece which fired the round. It is also readily available to any unit with 4.2-inch or 105mm howitzer support. Its only disadvantage is that it illuminates friendly forces coming into the area of illumination.

Aircraft flares have generally the same characteristics as illuminating ammunition, except that the light from a single flare is much brighter. Dropping the flares requires a great amount of coordination with the air unit, which is not easy to arrange or foolproof by any means. Since the parachute is large, the flare is subject to considerable drift as it burns out and thus becomes lighter. The chances are good that it will drift to where it is not needed, or worse, where it is not wanted, *i.e.*, over friendly troops.

The test report carried the firm opinion that artificial illumination should normally be used during the course of the night attack, for it makes possible and effective aimed fire support and the control of the attacking force, including its maintenance of direction. Although it was

visualized that there would be occasions when the local tactical situation would be of such a nature that a black-out attack would be successful, it was considered that the two essential services of artificial illumination would normally call for its employment. The worst that could happen with artificial illumination is that it could reveal friendly forces without a compensating benefit in the form of illuminating the enemy, but such should not happen if the artificial illumination is properly employed. The use of artificial illumination need not detract from the surprise element if it is used only after crossing the line of departure.

The decision having been made to employ artificial illumination in the attack, mortar and/or artillery illuminating ammunition (depending upon the type of supporting weapons available) forms the backbone of the illumination scheme, due to the characteristics of the light, the flexibility of its employment, its ready availability, and the fact that the original light source is not revealed. The flares illuminate enemy positions so that they may be engaged by gun fire. Beyond the cone of bright illumination, the light diminishes so that it can be used for movement light by the attacking force. Finally, the flares can be used as an orientation point for maintenance of direction. Flare illumination should commence as

soon as the line of departure is crossed and the objective is subject to aimed gun fire. The number of rounds should gradually be reduced and the flares placed further to the rear of the objective as the attacking force approaches the objective, in order to enable the latter to close under cover of darkness. Flare illumination should cease when the attacking force closes on the objective, since the advantage then accrues to the defender, who, being dug in and concealed, is less visible than the attacker. By reducing the number of flares and placing them further to the rear of the objective, the attacking force can close to within 300-400 yards of the objective before this type of illumination ceases. This distance is presented as a guide only, and is not intended to be followed rigidly. The idea underlying the foregoing scheme is to use the illuminating rounds to get the attack going, thus saving the tank-mounted searchlights, which are visible and therefore locatable, for the time when flare illumination must cease. The attacker can use the fringe light from the illumination rounds to aid his movement, but he should cease this form of illumination when it starts to illuminate himself.

With flare illumination ceasing as the attacker closes on the objective, there is a resulting dead space of darkness, when 18-inch tank-mounted searchlights come into play. The tank-mounted searchlights should normally be used by base of fire tanks only. These tanks should have reached a point between 600 yards of the objective, where they have not yet come under the cone of bright illumination, and 1200 yards of the objective, where their tank guns and searchlights are still effective. An optimum distance would be 800-900 yards, terrain permitting. Under this light and fire support, the maneuvering force can close on the objective. Generally speaking, use of the tank-mounted searchlights by the moving tanks was not favored in the test report, for there is little to be gained thereby. The light bounces too much to be useful as a driving light or pinpointing enemy positions and weapons. Use of the 18-inch tank-mounted searchlight should be keyed to the fire plans, and used by tanks doing the firing. As the maneuvering force closes and opens fire, it should then



use its searchlights. It will be noted how closely the Fort Stewart test and the 2d Armored Division test agree on the employment of the tank-mounted searchlights with respect to tying together the lighting and firing function. The "base of light" term, used by Colonel Kobbe, expresses this idea very well.

The tank-mounted searchlight was so highly regarded that recommendation was made that it be included in T/O&E on the basis of two per tank platoon. It was realized that adding more weight and complexities to an already heavy and complex tank is a serious matter. However, in view of the advantages to be gained by night combat, and the important role played by the tank-mounted searchlight in such combat, it was considered that the step should be taken.

60-inch searchlights, if available, should be employed in the indirect role during movement to the line of departure to provide movement and control light and during the attack to augment other light. The 60-inch searchlight can and should be used, if available, during the attack in the direct role to illuminate the objective if the terrain and enemy fire permit. The searchlights must have an unobstructed line of sight to be used in the direct role, which is not always to be found. In view of the terrain requirements, the vulnerability of the lights, and particularly their questionable availability, 60-inch searchlights can be regarded only as a special purpose means of illumination. The questionable availability stems from the fact that, while a tank battalion can reasonably expect to have artillery or mortar support and would have 18-inch tank-mounted searchlights if the decision is made to include them in T/O&E, the 60-inch searchlights would have to come from outside the division, and might not be available for a particular unit.

Aircraft flares provide more light per flare than illuminating ammunition, but are difficult to deliver in a precise manner. Moreover, the means of delivery is not assured. In view of the foregoing, it was considered that they are most effective in illuminating rear areas for the benefit of tactical air and/or artillery action.

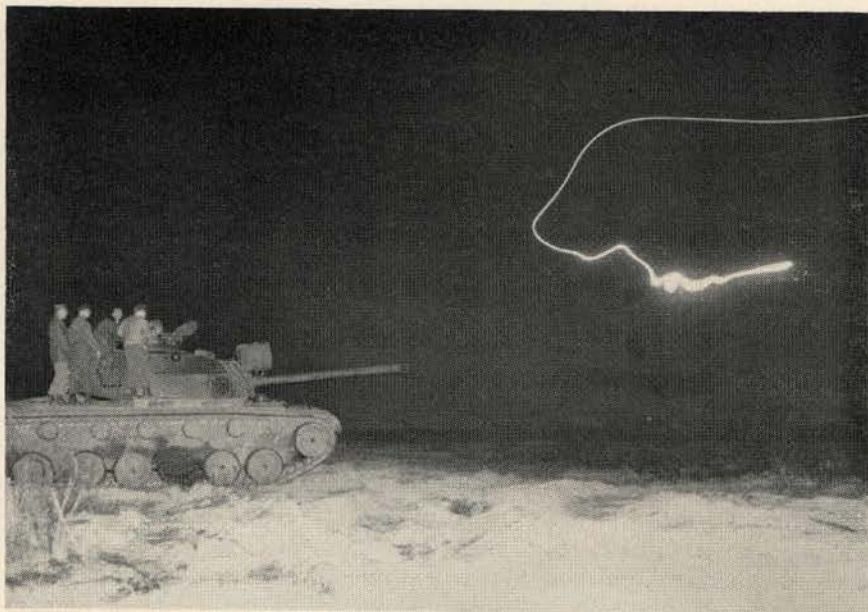
It is in defense that artificial illumination was found to be essential, for it makes it possible for defensive

fires to keep the attacker from overrunning the strong point. Once again, flare illumination by artillery or mortar illuminating ammunition is regarded as the backbone of the illumination scheme for the strongpoint in defense. The flares can be directed over areas where an attack is probable or has been detected by auditory perception or other means. The defender, being less visible than the attacker, can and should bring the illumination in right over his position as the attacker reaches it. Searchlight illumination (18-inch or 60-inch) from within the strongpoint is not regarded favorably, for it discloses the position of the light source, which is restricted in its movement as compared to the attacker. 18-inch tank-mounted searchlights should, however, be used as an emergency or final protective line measure as the attack closes on the strongpoint. Counter-attacking or striking forces in the defense would use searchlights in the manner suggested and found effective for tanks in the attack.

The foregoing test results regarding the effectiveness and essentiality or artificial illumination in defense point up the necessity for the capability of similar illumination in the attack. Even if the decision has been made to conduct a black-out attack, the attacker must be prepared to employ illumination on his part, preferably by illuminating ammunition.

Otherwise the advantage lightwise will be all on the side of the defender, and the attacker will be illuminated while the defender is covered by relative darkness. The only way the attacker can redress such a situation is to employ artificial illumination himself.

The illumination scheme just outlined is designed to serve the two essential purposes of providing light by which to fire, and to maintain direction and control. Other control measures can and should be employed, making sure, however, that they do not confuse the overall scheme. For example, it was found in the test that the use of searchlights for more than one purpose, i.e., marking the objective, marking boundaries, and providing general battlefield illumination, caused confusion. Thus if there should arise the desirability of using searchlights for more than one purpose, they should be used for the most important, namely, illuminating the objective. Since the latter use has a by-product effect of providing directional guidance, the problem should be readily resolved. In actuality, the scheme outlined above should normally provide all the control, as provided by light, that is needed. A refinement that can be applied is the use of tracer streams to maintain direction and mark boundaries. When so used, machine guns should be loaded with solid tracer



(U. S. Army)

This is a time exposure of an aircraft flare lighting the target area. Note the 18-inch tank-mounted searchlight. Tank markings have been masked by mud.



to prevent the marking fire from being confused with normal tactical fire. The method is sure, safe and simple, and this has merit.

A method of maintaining direction which proved to have little merit was the use of the tank-mounted compass. There is just too much movement of the compass needle to permit precise navigation for short distances, although it might work in very open terrain over longer distances.

The use of light to mark lines of departure was also regarded unfavorably. It was considered that light should be used only for really essential purposes and not prematurely so as to lose surprise. The line of departure can be identified by a terrain feature, supplemented by guides and/or artificial moonlight (diffused 60-inch searchlights from a distance) if necessary.

The foregoing comments on the use of artificial illumination are intended to present a sound workable solution to the problem of using illumination at night, a solution which exploits the characteristics of each means of illumination to the best effect. Since there is an infinite variety of tactical situations, so there will be many different applications of methods of using light. It is considered, however, that an approved solution should be presented as a foundation upon which to lay a plan for any particular operation.

Readers of the final report of the troop test will probably note that it is sanguine indeed with respect to the overall value of attacks by Armor at night. When one considers the great advantages of continuing the attack at night, the case for the night attack is strong. If the attack has been proceeding throughout the day and is either in the exploitation phase or has a chance of reaching its objective it is considered that the balance of advantages and disadvantages is such as to warrant the night attack in order to maintain momentum and prevent the enemy from re-establishing himself. The rewards and risks of any exploitation are great, and both are compounded at night. The rewards are the classic ones which accrue to any attacker who maintains momentum, and the risks are those which result from less adequate reconnaissance, information, and control at night. However, there is no valid rea-

son why the rewards of continuing the attack around the clock should be forsaken due to the risks and difficulties involved, for they can be alleviated, if not negated, by the liberal use of artificial illumination and a high state of training. The latter is an essential factor. If night operations are to be accepted as commonplace, then training therein should be so accepted.

The troops participating in the test were probably as well trained as any in the Army, yet even they found much to learn as the test progressed. It was mainly a matter of practice in applying normal control techniques, to render them effective at night, and above all, of psychological adjustment, so that operating at night receives the confidence that a well trained unit brings to daylight operations. Then there are tricks to the trade to be mastered; for example, the maintenance of proper distance between tanks. There is a tendency to rely on the cloak of darkness, to bunch up and not seek deflade. This could be dangerous should artificial illumination be used suddenly by the enemy. By practice, the crews can learn to maintain normal distances by guiding on exhaust flashes or glow, and on the rear black-out marker lights.

It is considered that the infra-red driving light is sound, useful equipment, and should be relied upon heavily for night movements. Once again, however, even the well trained battalion which participated in the test was somewhat lacking in familiarity with and confidence in the infra-red equipment. A prime cause of this condition was the lack of training literature, for there is nothing in field or technical manuals which covers the operation and use of the infra-red driving light and T41 periscope, which is used in conjunction with the light. Recommendations were made as to specific manuals in which to cover this important equipment. The big job with the infra-red light is to convince the troops that it is a vital part of their equipment and encourage them to put it to greater use.

One of the more important test objectives was to determine changes to current tactical doctrine as expressed in training literature, for little can be accomplished in the way of training until doctrine is set forth in appropriate manuals. The report of test car-

ried some specific recommendations with regard to this subject. Comments with respect to these texts dealt not so much with changes as with the necessity for more written doctrine on the subject of night operations. There is a great amount of literary service given to the proposition that night operations are becoming increasingly necessary, yet of the 430 paragraphs in Training Text 17-1-1, only 13 (or 3%) are devoted to night operations; nine on the attack, two on exploitation, and one each on defense and withdrawal. Training Text 17-33-2 has no paragraphs on night operations except one which makes reference to Training Text 17-1-1. Comments on these texts dealt with the need to strengthen the case for night attacks and artificial illumination and to explain in greater detail techniques of employing artificial illumination. It was recommended that there be more guidance as to the need for artificial illumination in the defense, and techniques for employing same.

With further regard to training literature, the test report recommended that the material contained in Training Circular 30 dated 20 August 1952, "Battlefield Illumination" be published in field manual form in view of the importance of the subject. Training circulars do not receive the broad distribution which field manuals do, and thus their value is limited. This entire subject of training literature is regarded as of vital importance to the training effort. If we intend that troops train intensively at night, and this test showed the necessity therefor, then it is essential that the troops have adequate, readily accessible, training literature to present the doctrine and techniques to be followed. This, of course, is appropriately accomplished through the medium of field manuals according to our current publication scheme.

It is generally accepted that modern battle demands increased mobility, and many, particularly armor people, believe that Armor presents the means to provide battlefield mobility. True mobility, moreover, demands 24 hour operation in order to exploit one of the most precious commodities of war—namely, time. Troop training, a doctrine oriented to regard night operations is normal, and the efficient use of artificial illumination will make possible the true mobility.



## 65 Years Ago

It has been previously suggested that in future wars conditions will constantly arise in which armies will confront each other for days, weeks and possibly months, the invading force finding all progress checked by the stubborn defense of intrenched lines. It is under these conditions that the cavalry, by independent expeditions against the enemy's lines of supply and communication, will find full opportunity to demonstrate the value of its dismounted fire action. Expeditions like those of Sheridan's around Richmond, in May, 1864, and Wilson's against Selma and Montgomery, Alabama, in March, 1865, are only possible to cavalry possessing the ability to fight equally well mounted or dismounted; and the conditions that must arise from the increased efficiency of small-arms fire are those that will give great value to such expeditions. Cavalry that can fight equally well on foot or horseback, given some horse artillery, combines the powers of the three arms, with the immense advantage of celerity of movement. These expeditions should not, however, rely for success on celerity alone. They should be in sufficient force to command respect, and be able to devote all necessary time to the destruction of railroads and supplies.

MAJOR MOSES HARRIS

*Smokeless Powder in its Relation to Cavalry Efficiency*

## 50 Years Ago

When studying military history something more is wanted than the mere absorption of the narrative and the retention in memory of certain facts. Combined with the mastering of the particulars narrated in the history, there should be a comprehension of the lessons in strategy and tactics which the events recorded in each campaign illustrate, and the mental analysis of the causes which led up to the success of one commander and brought about the failure of another, so that material profit may be wrung from the study, which would be likely to benefit the officer should he ever be placed in a similar situation. Without a close study of this nature it is quite impossible to gauge the extent of the difficulties that are ever arising in war, and which test to their uttermost the superior qualities of mind which every great commander must possess. All our training is lessons of war, as well as the wonders of modern science, that we can hope to acquire that intelligent combination before which brute force and even individual skill must fail.

The professional soldier who reads history after this fashion, equips himself with the power to apply the facts of yesterday to the circumstances of today and tomorrow. It is not, after all, a difficult habit to acquire, and without it the study of strategy or tactics is of little value to the really practical soldier.

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*The Study of Military History*

## 25 Years Ago

Anyone who has been through the Cavalry School has heard the statement that the three principal characteristics of Cavalry are "Mobility, Firepower and Shock."

Of these, Mobility is the outstanding and the one characteristic that has made it possible in the past and which in the future will make it possible for the Cavalry to bring the other two to bear in an effective manner.

In the middle ages Cavalry relied to a considerable extent upon the defensive power of armor, and in making this mistake sacrificed its value as a mobile arm to such an extent that it could charge at no gait faster than a trot. After the introduction of fire arms, armor became so heavy that if a knight fell off his horse he had to remain flat upon his back until someone came along to pick him and put him back upon his feet, or what was more likely, put him out of his misery.

It is recorded that Cavalry charged at a trot, discharged their pistols and withdrew to reload. Gustavus Adolphus finally realized how ridiculous the Cavalry of the day was and took the armor away from it, trained his Cavalry to maneuver at a gallop in masses that could strike at a vulnerable point.

Since then the Cavalry has not failed to utilize its mobility, despite the power of "Modern Arms."

MAJOR EUSTIS L. HUBBARD

*And the Greatest of These is Mobility*

## 10 Years Ago

The unassailable fact remains that in a fight, a good big man will generally defeat a good little man. The temporary advantage gained by the little man in providing himself with a knife or gun is rapidly offset when the big man does the same.

So it is with tanks. Our tank specifications will be greatly influenced by the type of tank the enemy can place against us in the field. Enemy tanks possessing sufficient armor (either in thickness or strength) and type armament to permit them to roam about on the battlefield with impunity must be combatted by tanks comparable in armor and armament. If the enemy uses a tank weighing 100 tons, assuming that such a tank makes full use of strength-giving alloys, and all the technical skill that we must assume the enemy will have, then we will be opposing them with a tank which, willy-nilly, must be of the same weight, whether we like it or not. Let this statement not be construed as indicating that any thinking armored cavalryman desires a tank behemoth, but simply as a statement of cause and effect.

So, to answer the lesson question:

*First*—Let us design a tank that may be flown into battle, either whole, or in parts.

*Second*—Let us continue to develop our present tanks with the idea of making them better than any tank or weapon the enemy may pit against them, regardless of whether this requires a 100-ton tank, or a 200-ton tank, or only a plastic tank.

COLONEL PAUL A. DISNEY

*Armored Cavalry of the Present—and Future*



# THE ARMOR GROUP

By **LIEUTENANT COLONEL NEIL J. ASTING**

**T**HE armor group with its attached battalions assumes a new importance to army ground forces in the roles depicted here.

First, some background information will help the reader to a better understanding of this little known armored organization.

The armored group was born during World War II with the mission of command, control and supervision of one or more separate tank battalions assigned to corps or field army.

During World War II, the groups exercised this function stateside, but in the European theater they were utilized to form armored sections at corps and army level. Actually the group is a tactical organization with the capability of fighting its attached battalions, when reinforced, in a man-

ner similar to a combat command, "for short periods of time." The reason for including the words "short periods of time", in this capability, is because the group organically lacks the necessary personnel and equipment to carry on a sustained armored operation.

The principal reason why armor groups did not exercise this combat capability in the European theater was due to the demand of infantry divisions for permanent attachment of the separate tank battalions. Consequently, there were no tank battalions for the groups to command and control.

Originally, the separate tank battalions (and possibly an entire group), were to be attached to infantry divisions to aid in accomplishing specific tasks and then revert to corps control when the job was completed. But, it did not work out that way. The infantry divisions wanted a tank battalion with them continuously.

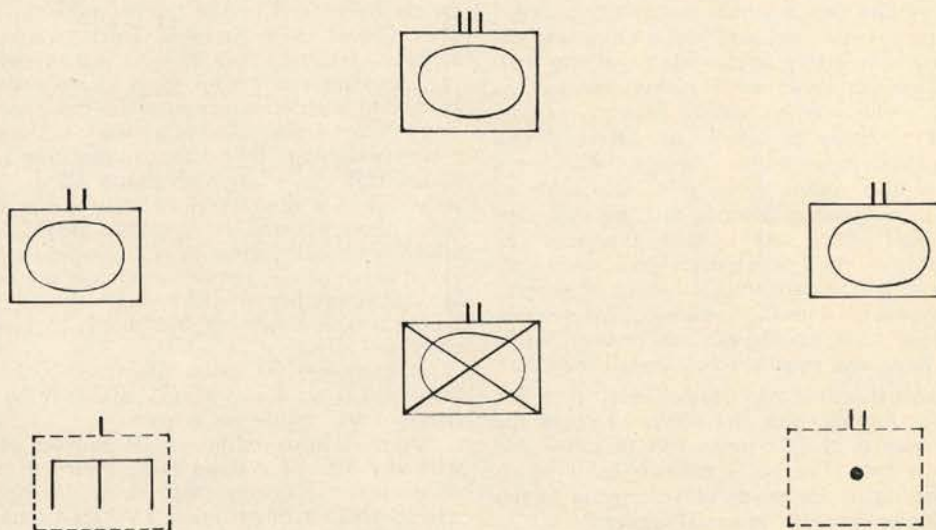
The continuous attachment of the separate tank battalions was hard on battalion personnel. When an infantry division was pulled back for rest and reorganization, the tank battalion usually was ordered to remain in

position and became attached to the new division upon arrival. This meant that the tank battalion had to accomplish its reorganization as best it could under whatever conditions happened to exist.

The use of a group headquarters and headquarters company to form an armor section for a higher headquarters did not utilize its manpower or equipment to best advantages. Formation of an armor section at a higher headquarters should only require a few officers and enlisted men at the very most. Certainly it should not require an entire headquarters and headquarters company!

The use of the armor group as an armor section left it with very little to do. It could not influence the tactical employment of the tank battalions attached to the infantry divisions since it did not function as a command organization. The group commander and his staff did visit the battalions and were sometimes helpful in getting replacement personnel and equipment to meet battalion needs. This is not intended to infer that the infantry divisions were unmindful of the tanker's requirements. On the contrary, once they learned to appre-

**LIEUTENANT COLONEL NEIL J. ASTING**, Armor, served in Europe during World War II with the 774th Tank Battalion. Reverting to civilian status in 1945 he returned to duty in 1948 as Reserve Instructor in Boston. In 1950 he was assigned to the Far East. Returning Stateside in 1953 he was assigned to Fort Hood. After attending the Associate Advanced Class at Fort Knox he was assigned to his present position as Advisor with the Georgia National Guard.



**ADDITION OF SUPPORTING TROOPS MAKES THE ARMOR GROUP A FORMIDABLE TASK FORCE**



ciate the tanks they took care of them as they did their own units. In some instances this included furnishing infantry replacements when armor personnel were not available.

Now that the infantry division has an organic tank battalion, the armor group will have battalions to command and control. The group with its battalions becomes a valuable asset to the corps, not only by adding more firepower, but also by giving it the potential to sustain an attack or defense even when its armored or infantry divisions are crippled by nuclear attack.

This ability can be realized by the substitution of whole battalions from the group, or even the entire group, for a battalion or combat command, whose combat effectiveness has been destroyed. In the case of destruction of a divisional battalion, the remnants of the destroyed battalion reverts to armored group control and is reconstituted and is made ready for combat again. Where an entire combat command becomes ineffective, and its place taken by a group, the combat command would assume the status of a group for rehabilitation purposes. This leads to the need for revisions of the present TOE of the group to make it more like the combat command it may replace.

The use of the armor group in this role practically eliminates the need to pull a division out of combat for a

long period of time for rest and reorganization because some of its units have become ineffective.

The group with its attached battalions also gives the corps commander a nice little reserve Sunday punch. He can quickly form it into a task force by giving it the necessary support for a counterattack, to fill a gap between divisions, or for flank security. It could also be used to spearhead the attack of an infantry division against an objective heavily defended by enemy armor.

The group should have at least one separate armored infantry battalion attached to it. In general armored infantry sustained higher battle losses during World War II than did tankers. Again in the next war their losses will be higher because they will be less protected from the effects of modern weapons. If the group is to meet unit replacement needs of armored divisions, it must be able to furnish armored infantry battalions as well as armored units, and have the means to effect reconstitution of these units. The inclusion of the armored infantry battalion in the group structure will also enhance its ability to execute a combined arms combat mission.

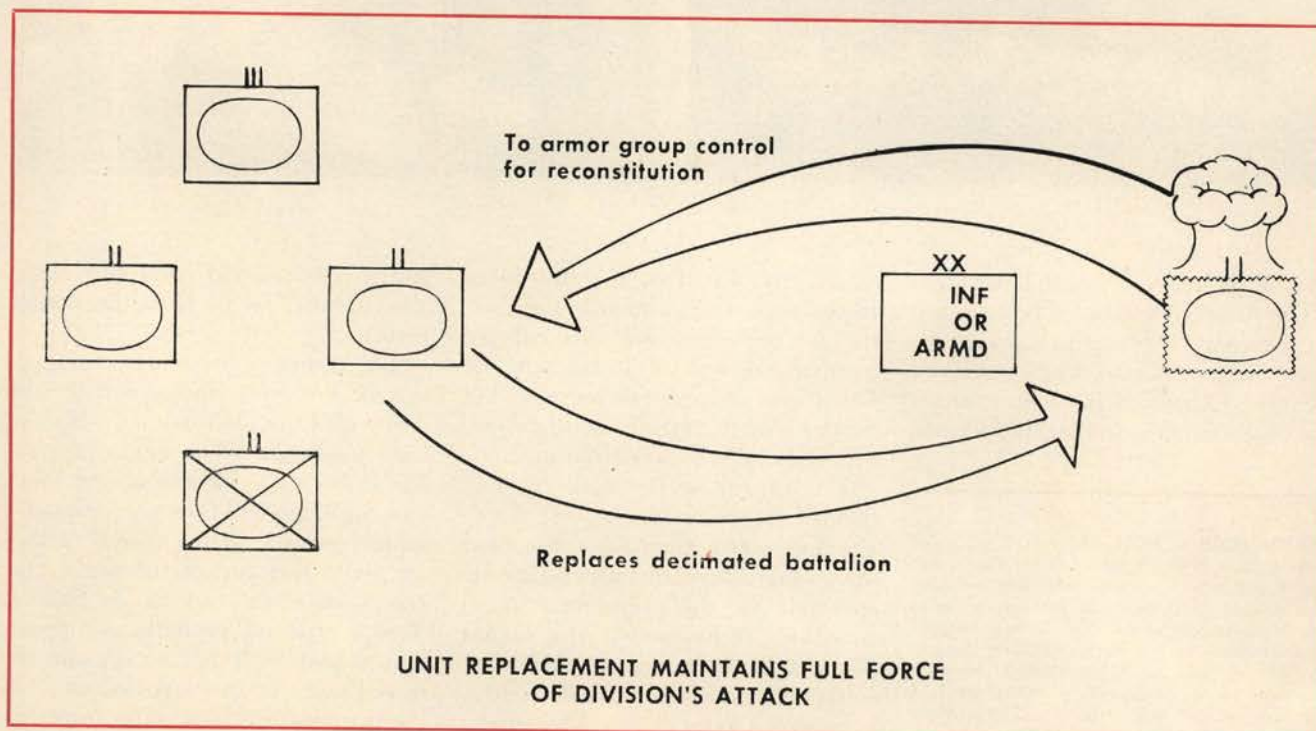
As visualized the armor group would take control of an armored unit hit by a nuclear weapon at the scene, and assume responsibility for executing rescue and salvage opera-

tions. Assumption of this task leaves the division free to concentrate on its mission.

The adoption of the unit replacement system would not eliminate the individual replacement method. Light battle losses would still be filled from replacement pools. Replacements for units being reconstituted would also be drawn from individual replacement sources.

Actually the same general system was used during World War II, except that it was not called a unit replacement system and was done on a larger scale. When a division became ineffective it was pulled back and replaced by a fresh division. After its units were reorganized (reconstituted), it was ready to go again. The battalion or group system of replacement as described here should reduce the need to pull divisions out of the line for reorganization (with the resultant loss of combat time), since the battered units would be quickly replaced by fresh ones.

While the armor group was born during a period which is now considered to be in antiquity it basically retains the modernity of the battle groups and combat commands along with the inherent flexibility of its branch. All it needs to bring it up-to-date with its sister organization, the combat command, is a modernized TOE and a rewriting of its mission and capabilities.





# THE ARMORED SCHOOL, SOUTH VIETNAM

By MAJOR JOHN V. NOLL, JR.

**O**N the high ground overlooking Thu Duc, a suburb of Saigon, is one of the newest, if not the newest, armored schools in the Free World. Here in spacious modern buildings young Vietnamese service men are busily engaged in the pursuit of the fundamentals of armored warfare. Tactics, gunnery, communications, maintenance and all other subjects required to enable them after graduation to weld the armored forces of the new republic's armed forces into efficient hard hitting mem-

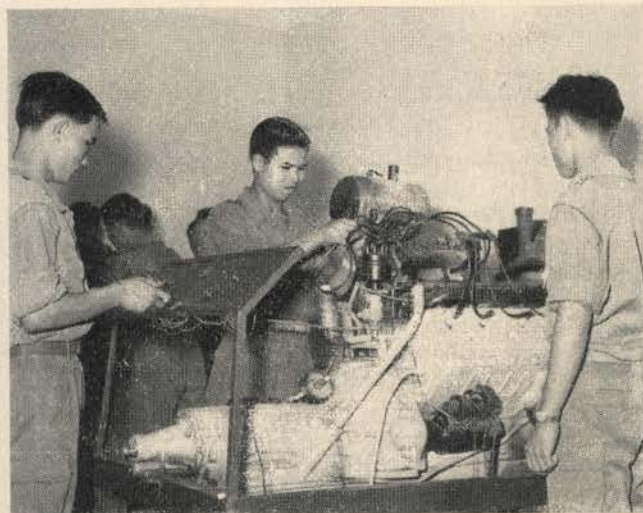
patterned after that of the American service school, adapted, of course, to requirements peculiar to Vietnam.

There are four principal sections in the school's organization. The Office of the Commandant, the Administrative Section, the Bureau of Instruction and School Troops.

All of these sections are small but efficient, their size being dictated by requirements. The Office of the Commandant has two officer spaces, the Commandant and the Executive Officer who is, in addition to his other

Armored Center consist of a composite Reconnaissance Company. This unit is not permanently assigned to the school. It is organic to a regular reconnaissance unit and is assigned to the school for a six-month period. After completion of the six-month tour it returns to its parent organization and another company is brought in.

Since the number of armored units in the Vietnamese Troop Basic is fairly low this procedure will, with each successive cycle, provide all com-



bers of the team. Truong Thiet Giap (The Armored School) was organized in February 1955 utilizing the Armor Section of the former ARVN Reserve Officers School as a cadre. Its organization is similar, in fact was

duties, also Chief of the Bureau of Instruction. The Administrative Section has one officer and three enlisted men, the Bureau of Instruction has ten officers and two enlisted men and School Troops consists of three officers and eighty-two enlisted men.

The Bureau of Instruction is subdivided into four committees: Tactical, Automotive, Communications and Weapons. These committees are responsible for the preparation of all programs of instruction and lesson plans, and the instruction and training conducted in the Armored School.

School Troops at the Vietnamese

pany-sized Armored units with valuable training "right from the horse's mouth."

The company presently serving as School Troops is equipped with M8 Armored Cars, M3 Scout Cars, M8 Gun Carriages, M24 Tanks and an M3 Recovery Vehicle. Since all Vietnamese Armored Units are reconnaissance type due to the nature of the terrain in this part of the world, future companies serving as School Troops will be similarly equipped. The school itself has no organic armored vehicles in its possession. All the equipment is brought in from the

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**MAJOR JOHN V. NOLL, JR.**, Armor, graduated from OCS in 1942. He served in the Pacific during World War II with an AAA AW Battalion. He reverted to civilian life but was active in the National Guard. In 1951 he was recalled and assigned to the National Guard Bureau. In 1953 he went to ALFSE, Turkey. Returning Stateside he was assigned to the 894th Tank Battalion at Fort Knox. He is now the Armor advisor to the Armored School, South Vietnam.



field by the company being assigned.

Programs of Instruction closely follow those employed at Fort Knox. In fact they are the Knox POI's adapted to the requirements and the equipment capabilities of the Vietnamese Armed Forces, and the directives of the General Staff. Lesson plans are also adapted from those prepared at Fort Knox, as well as selected manuals.

The physical plant at the Armored School is excellent. The buildings are new and modern. Classrooms are well lighted and ventilated. Personnel of the school have constructed many attractive and highly useful training aids from scrap and salvage material. These training aids vary from a cut-out turret to models of armored vehicles currently in the hands of troops. The live engine room is especially well fitted; students work on actual running engines indoors.

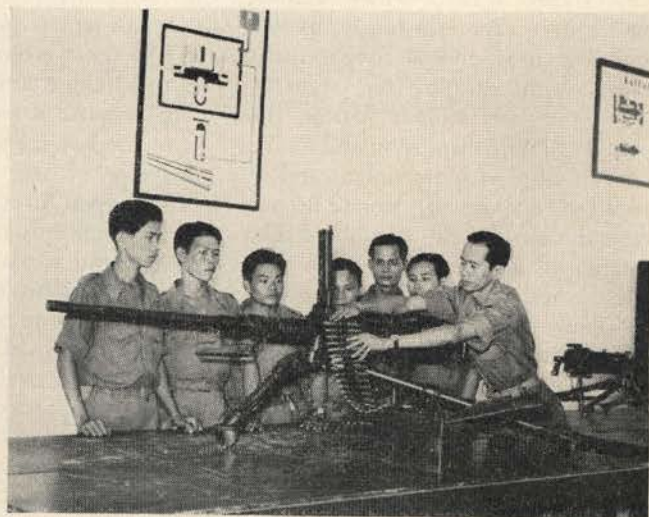
The biggest problem confronting

diers, better known to the American as replacements. Following induction the Vietnamese recruit receives eight weeks of basic training at the Quang Trung Training Center located not far from Thu Duc. Upon completion of the eight weeks basic training selected personnel are sent to the Armored School for advanced individual training. Hence the Armor School has the additional responsibility of conducting an ARTC. The advanced individual training program lasts for eight weeks with 336 hours of instruction. During the eight weeks the recruits, many of whom had never in their lives worked with mechanical equipment, are transformed into qualified tankers. Following completion of their advanced individual training the soldiers are sent to armored units to complete their one year tour of military service.

In addition to the courses currently presented at the school a basic of-

there are too few students available. Selected officers will continue to receive off-shore schooling until at some time in the future the requirement for such classes at Truong Thiet Giap may be justified.

The present commandant of the school is Captain Nguyen Duy Hinh, a forceful young officer and a dyed-in-the-wool tanker. He is a graduate of the company officers course of the Armor and Cavalry School, Saumur, France, and Associate Advance Class 3 in 1956 at Fort Knox. His executive officer and Chief of the Bureau of Instruction, Captain Luong Bui Tung, is also a graduate of the Saumur School's Company Officers Course. There are four other Fort Knox graduates on the staff: Lieutenants Le Hong Tien and Phan Tien To of the Automotive Committee, Lieutenant Nguyen Duc Dung of the Weapons Committee and Lieutenant Phan Thanh Xuan of the Communi-



the staff at this time is an area for service firing. Only sub-caliber ranges are available in the immediate vicinity. The nearest ranges for service firing are approximately 160 miles away at Three Frontiers. These ranges will be completed in early 1958, the classes will then be rotated to Three Frontiers for service firing.

There are three classes currently in session. A Junior noncommissioned officers class, a tank maintenance class and a class for "New Soldiers."

Perhaps the most interesting of these is the course for the new sol-

dicers course will begin in October. This course will be attended by graduates of the first officers candidate class, presently in progress in the Infantry School of the Thu Duc Military School Center. This course again is patterned after the BOC of Fort Knox adapted to Vietnamese requirements.

Courses still in the planning stage are a Senior NCO Course and an Organizational Maintenance Course. No plans are being made at present for a Company Officers Course or an Advanced Officers Course since

cations Committee. Two additional officers are presently en route to the school from Fort Knox.

The Commandant and his officers and men are to be commended for the progress they have made in so little time. Starting from scratch they have produced a school of which they can be justifiably proud. They have the more important satisfaction of knowing that more than five hundred graduates are presently serving in the Republic of Vietnam Armed Forces, and that all graduates in the future will be well trained Tankers!



# Are We Training Leaders?

By COLONEL JOHN F. RHOADES

**T**HE nature of atomic war is the subject of grave concern and intense study by military men the world over. This subject is not a matter of interest to the military alone—the civilian armchair strategists are also having a field day. This is healthy and this is good. There can be little doubt that the military services of the United States are doing their best to prepare for the next war, instead of training to fight the last war.

True, the nature of this atomic war is not too clearly defined yet; however, a picture of the future battlefield is beginning to emerge. The sum total of the many concepts conjures up the picture of a very loose amorphous battlefield of great depth with no clearly defined front line. A rather depopulated combat zone in which relatively small units are constantly moving, fighting independent engagements, rapidly concentrating for larger but short and very violent battles, then equally rapidly dispersing and moving on. This is a vicious, violent and uncivilized type of war. Atomic firepower is the king of the battlefield. Devastation of savage magnitude is widespread, and entire units disappear in the flame and dust of the mushroom cloud that is becoming all too familiar.

A tremendous effort has been organized and directed to the study of future tactical concepts, organizations and equipment. It is generally acknowledged that all military power stems from the land, and that secure land bases are essential to all forms of military power. It is generally agreed that only armed fighting men can seize, secure and hold the land areas essential to the generation and support of military power. Thus, man, the fighting soldier, is still the essential element on any battlefield—future as well as past.

As noted, immense efforts are be-

ing focused on the development of tactical doctrine, organizations and equipment with which to fight the next war, if and when it comes. It is also a fact that a significant portion of each Service's R&D funds is being directed to the study of the human element on the battlefield—man. The unique value of the scientific approach to the study of man that the trained psychologist can offer is being exploited; however, the simple combat experienced leader has a wealth of practical experience in this field that is generally closed to the trained psychologist. It is knowledge that is difficult to express in words that are meaningful to the man who has never experienced close combat. The purpose of this article is to stimulate thinking by the military "layman" on this area.

First, let us isolate our problem. While there are many problem areas in this field, training is certainly one. The purpose of any training program is to prepare men and units to fight the type of war that they may be called upon to fight. Even though tactical concepts and doctrine, organizations and weapons systems are undergoing evolutionary changes, one paramount requirement has emerged in clearly defined fashion. The magnitude of the psychological impact of atomic weapons combined with the normalcy of isolated, independent, small unit actions clearly has established a demanding requirement for strong, competent, confident leadership at the lower tactical levels. *Are our training programs designed and pointed toward producing and developing these leaders?* Based on comments of officers and noncommissioned officers who have served with combat units in training since World War II, we are not training leaders at the battalion—squad levels.

Rather than detail the faults, let us look to see what we can do to correct them. While it is true that the bold, forward look of progress must guide our thinking, the past still provides a wealth of experience that may give us leads, and may prevent our repeating old mistakes. The tactical concepts being bruited

about today call for military activity not entirely unlike the actions typical of the Indian wars; or, more recently and in more modern form, of many Cavalry actions in Europe during World War II—small isolated units operating independently and alone on the field of battle.

What can we learn from the experience amassed during the Indian campaigns and by our Cavalry actions in the various wars? One obvious conclusion is that men *can* be conditioned to accept the strains inherent in isolated, small unit actions. From personal experience gained in World War II, I know it to be a fact that men conditioned to this type of operations grow to prefer it. When men so conditioned are restricted to a limited zone of action, with mutually supporting units on either flank, they have a feeling of being hemmed in—of being denied freedom to maneuver, and of being forced to make a frontal attack with little or no possibility of achieving surprise. Thus, historical evidence indicated strongly that isolated, small unit actions do not present an inherent and insurmountable obstacle.

How, in the past, have men been trained or conditioned to accept the strains of this type operation? One obvious answer is that in almost all their training the units were constantly operating as small, independent forces. In other words, timewise, the bulk of unit training was devoted to separate company, platoon and even smaller unit training. As a result, not only did the private soldier grow to accept small, independent operations as being normal, and thus lost his fear of such type operations; but, equally or more important, the small unit leaders were conditioned to carrying the full responsibility for their men and equipment, to making independent decisions. The net result of the heavy stress on small unit training and repeated, independent small unit operations was the development of nearly complete confidence of the private soldier in his own combat capability as an individual, and in the combat effectiveness of his squad, platoon and company as an *independ-*

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COLONEL JOHN F. RHOADES, Armor, a 1935 USMA graduate served in Europe during World War II with the 4th Armor Group. Afterwards he instructed at West Point, attended C&GSC and joined the 2d Armored Division. He was next assigned to USAREUR. Returning Stateside he attended the Army War College then instructed at C&GSC prior to his present assignment as CO, 17th Armor Group at Fort Stewart, Georgia.



ent fighting team.

A training program slanted so heavily on small unit training has the obvious disadvantage of failing to train commanders and staffs to make effective use of the means available to a combined arms team. In short, this program provides for training leaders up through company grade, but how about the battalion, regimental and higher commanders and staffs? This has always been assumed to be a major problem, but is it in fact an insurmountable problem? Certainly our experience in the 1940-42 maneuvers appeared to prove that our Achilles heel then was the inadequacy of our higher level commanders and staffs. They had seldom even seen an entire division assembled, let alone had the opportunity to maneuver and employ such a size force. As we were confronted with the problem of building and fielding *in combat* many divisions and corps in the minimum time, it was essential to provide senior commanders and staff officers with practical experience in the maneuver and employment of these larger forces.

Let us, however, remember that the conditions of 1940-42 were peculiar to that period. With our present defense establishment and program, to include tactical concepts, the conditions peculiar to '40-'42 do not apply. First, we should recognize that the combined arms team is no longer centered at division level. Small unit training will be combined arms training. We no longer have to have a division or even an RCT level maneuver to gain such training. How about the training of division and higher level commanders and staffs? Is it not true that, to a degree far beyond that of the past, divisions will no longer have the problem of conducting tightly interacting, if not actually interlocking, highly coordinated actions of battle groups? Will not battle group commanders normally be given broad mission-type orders and be operating in wider zones, well removed from their neighbors on either flank? This is not to say that coordination and planning of fire and maneuver will not be required of division headquarters, or that it will be simple; however, the frequency of tightly knit, massed operations will be greatly reduced. In preparation for World War II, the German Army effectively trained division and higher command-

ers and staffs primarily by map exercises and CPX's. Seldom were they able to assemble divisions for division field exercises. Granted this takes time, time we didn't have in '40-'42, but time that we *do* have now.

It must be recognized that to a far greater degree than heretofore victory on the field of battle will depend on the combat effectiveness of the *small units* and *small unit leaders*. These people must train on the ground in actual field exercises. Only in this fashion can the men in the units develop the *esprit*, morale and confidence in the combat effectiveness of their units and leaders to live, operate and win in battle. And it should be noted here that to the soldier "his unit" is primarily his platoon and his company—at the very most it is his regiment (battle group).

Have the new weapons and equipments introduced factors that invalidate conclusions based on experience gained in the past? Certainly the psychological impact of atomic weapons is of such a magnitude that it may well cause greatly differing effects on the individual. It is not sufficient to say that it makes no difference whether you are killed by a 30 caliber rifle bullet or a megaton nuclear weapon. True you are just as dead either way, but the threats do not have equivalent impact. Further there is no use in denying that there is an increased probability of meeting death on a battlefield dominated by weapons of such massive, area destructiveness. We must face up to the fact that we have a psychological problem of a magnitude never before encountered.

Since for the great majority of the time any combat unit will spend on the battlefield it will be operating independently and well separated from other units, more than ever the level of leadership required is that of the small unit commander.

Small unit leaders can be developed and trained *only* by giving them the responsibilities they will have to carry in combat. They must be allowed to go out and tie things up and make mistakes. In so doing one learns *why* it is wrong as well as the fact that it is wrong. Also one remembers committed mistakes longer than he remembers text book lessons.

If we adopt a program concentrating on small unit training which permits small unit leaders to go out

on their own and learn by doing, we must ensure adequate supervision without stepping in and taking away the freedom of the subordinate leader to exercise his own initiative. Fortunately, in this area, modern technology may provide a very effective means. I visualize senior commanders using TV to record, even film for later play back, exercises being conducted by subordinate units. Knowing the assumed situation and mission the commander could readily critique the problem. If the exercise had been filmed, the key leaders could review it and *see* their mistakes through the eyes of the commander. All this without the presence of the senior commander on the scene—which always has an inhibiting influence.

In short, let's take first things first. To meet the tremendous morale and psychological problems of the atomic battlefield and to fight and *win* the atomic battles, first and foremost we *must* have strong, competent and *confident* small unit leaders, and competent effective small units whose men are *convinced* of their unit's combat effectiveness as a *separate* unit while *on its own*. Our training programs must be aimed directly at achieving this goal. If our unit commanders are going to be expected to fight with only broad mission type orders, let's give unit training back to the unit commander. Higher headquarters, beginning with CONARC, should establish standards and goals to be accomplished. Intervening headquarters can further refine training programs to fit the peculiarities of the local situation, and to establish their own inspection and test requirements. Specific decision as to how and what to include in training must be left to the men that are responsible for fighting the battle—the *battle group* and the *company commanders*.

Not only would such a program train effective small units and *competent, confident* small unit leaders, but also it would restore the prestige of the noncommissioned officer, thus going a long way toward stabilizing our personnel situation. Combine this with an *effective* gyroscope program based on the historic regiment-battle group and we might once again start producing *career* noncommissioned leaders, and units to whom the word *esprit* is not just another word.



# THE SOVIET POTENTIAL IN ARMOR\*

*This article, compiled from unclassified sources, is a summary of available information on Soviet armored equipment. Any evaluations and conclusions are left to the reader's discretion.*

**R**EGARDLESS of the type of military action in which the United States may be required to engage during the next several years—limited or unlimited; nuclear or conventional—it appears certain that in any such engagement we will be called upon to face equipment built by the USSR. We in the military are vitally concerned with and interested in the timely and adequate development of unconventional, radical and unique equipment which may be provided for our military establishment in the future. In evaluating our current capabilities in the U. S. Army, we must always keep in mind the six or eight years of *lead time* usually required to produce even one prototype of a new vehicle, for instance, followed by years of testing and perfection before it is ready for issue to the troops. We must base analysis of current techniques of warfare upon the capabilities of the equipment with which we will be expected to operate in case of armed engagements in the near future. And we can confirm our analysis of the concepts of present-day warfare by examining the composition, tactics, and current production record of our potential enemies. We are certainly interested in the challenging proposals for new weapons systems which may eventually revolutionize warfare as we know it today. But it is essential that we be more realistically concerned with the equipment which will be in the hands of our own and enemy troops during any *brushfire* engagements in which we may be involved during the next few years, or during all-out war if

it occurs before *push-button warfare*, either nuclear or conventional, becomes an actual capability.

In planning and training to make today's units combat-worthy in case of armed conflict against Soviet-built equipment, leaders in Armor must constantly keep themselves informed as to the capabilities of Soviet Armor. Unfortunately, information is not always available upon which to make a logical appraisal of Soviet capabilities because of the limitations imposed by security requirements. This article is intended to summarize some of the information which has been printed in unclassified sources, setting forth such current information about Soviet armored equipment as is available, and leaving evaluation and conclusions as to the Soviet potential to the reader, taking into consideration his own knowledge relative to the capabilities and density of armor in our own Army today.

Several general comments are appropriate in an analysis of Soviet Armor. It is important, first, to consider that since 1945, Russia has outstripped the United States in the production of armored equipment. Current estimates define the Russian army as a force heavy in armor, consisting of 65 armored and 105 rifle divisions.

This emphasis upon armor in the current Red Army stems from a basic element in Soviet tactical policy. The cardinal principle in United States Armor tactics, employment in mass, is heartily subscribed to by the Soviets. The Soviet concept, however, carries this principle much farther than employing armor by battalions or divisions. Soviet tacticians stress the use of tank armies, committed as a major part of strategic planning;

the Soviets have loudly criticized our own tactics in armor, maintaining that the United States fails to capitalize upon the full potential of armored units by not utilizing larger masses of armor operating as a tactical entity.

This endorsement of mass employment of armor results from what the Soviet Army considers one of its major blunders during World War II. At the beginning of the war, Soviet armor was spread quite thinly along the front. During the first three months of the war, 17,500 of the 24,000 Russian tanks which were committed were destroyed, while the Germans during the same period committed only 2,434 tanks and sustained casualties of 550 tanks. These unusual losses on the part of the Red Army resulted in drastic changes in the concepts of Soviet tank-warfare, and during the rest of the war both the Russians and the Germans employed entire tank armies in their operations.

In addition to this difference in emphasis upon strategic employment of armor in mass between the United States and Russia, there exist several other fundamental differences in the tactical use of the tank. The Soviet Army, like that of the United States, uses tanks either as the principal force in an operation, supported by infantry and artillery; or in a supporting role, with armor assigned or attached to infantry units, furnishing close support. The intended use of the tank itself in the Russian Army, however, even at unit level, conforms more closely with the principle of employment in mass than does its use in U. S. tactics. According to Soviet doctrine, the firepower, mobility and shock action of the medium tank should be directed toward the

\*Prepared jointly by members of the Automotive Department, U. S. Army Armor School.



preselected objective, and enemy tanks should not be permitted to interfere in this mission. Other weapons have been developed to engage enemy tanks when they are encountered, and the medium tank seldom engages enemy armor voluntarily. This concept, of course, is not in accord with United States policy that the medium tank is the main battle tank, which is expected to engage and destroy enemy tanks as a matter of course and which requires little or no additional protection against enemy armor.

This difference in concept in Russian tactics partially explains the heavy emphasis in Soviet tactics upon the use of artillery support. Artillery support for all types of combat is provided wherever possible, and many different types of artillery have been produced, in large quantities, to accomplish this capability. Soviet tactics rely heavily upon the use of self-propelled artillery in armor engagements. Heavily armored assault guns and antitank artillery have been developed to engage enemy tanks, so that "tank-to-tank" combat will not deter the movement of the principal mass of armor to its preselected objective.

The heavy tank has been specifically designed to provide antitank protection for the Soviet medium tank, in line with this same concept, and its primary role is to deal with enemy armor and antitank weapons.

The training in Soviet armor units corresponds closely to that in our own units. Universal military training is enforced, and the trainee spends three years in the service. The training program is clearly defined and all-inclusive in scope to provide well-trained crews. Basic training for tank crews includes individual and crew training, encompassing such subjects as gunnery, driving, maintenance and communications. Unit training includes all types of tank tactics and combined arms training with infantry, artillery and air support. Four months of each year are devoted to individual and small unit training, and the remaining eight months are used for unit training. Each year the unit training period culminates with army-level maneuvers.

The following paragraphs deal with the information which can be

published at the present time in regard to the major items of Soviet equipment. One significant characteristic which pertains to all of this equipment is the use of diesel-power. The Soviet Union defends this extensive use of diesel engines primarily because of decreased fire hazard and better fuel economy. It is interesting to note that U. S. policy restricted the use of diesel fuel for tank engines between 1943 and 1956 because of the possible non-availability of the quantities of that fuel which would be required in case of mobilization. In 1956, however, the Department of the Army announced a change in policy, permitting the use of diesel fuel in tanks, self-propelled artillery, armored personnel carriers and tank transporters. U. S. leaders in Armor have long appreciated the inherent advantages of the application of diesel power to armored vehicles, and it appears likely that there may be extensive resort to diesel power for U. S. armored vehicles in the near future, when satisfactory engines with matching transmissions are made available.

#### Light Tanks

The light tanks which are currently in use or in production in the USSR are generally limited to amphibious types of lightly armored vehicles. A series of amphibious tanks has been developed, at least one model of which is presently in the

hands of troops. No information is available, at the present time, as to the existence of any light tank which is comparable to our light tank in firepower or armor protection.

#### Medium Tanks

The Soviet Army currently employs two standard medium tanks, the T34/85 and the T54. Although current policy provides for phasing out the T34/85 in active Army units, replacing it with the newer, better-armored, heavier-gunned T54, we must still consider this earlier vehicle when discussing Soviet Armor because of the vast number stockpiled for reserve units and other M-Day forces. Also, it is primarily the T34/85 with which the Satellite Armies are equipped.

**T34/85.** This vehicle first appeared during the later stages of World War II when it gave an outstanding account for itself against the German forces. Featuring excellence of design and extreme simplicity, which the Soviets have consistently achieved in their armored vehicles, it has the most sharply-sloped armor plate of any medium tank which saw service in World War II. Further, it possesses the heaviest armament of any vehicle in its weight class, and continues to be one of the most efficient tanks in existence. It was this vehicle which saw extensive service against UN troops in Korea.

**T54.** This tank is the latest-known



(U. S. Army)

The T34/85 medium tank first appeared during World War II.





(U. S. Army)

The T54 medium tank first was seen in the Hungarian revolt.

venture of the Soviets into the medium tank field. It first received worldwide recognition during the recent Hungarian revolt when it appeared in considerable numbers. Retaining all of the better features of the T34/85, it also incorporates new features which give added emphasis to Soviet originality in tank design. Of particular interest is the fact that, despite the improvements which have been incorporated in the T54, including the installation of a 100mm tank gun to replace the older 85mm weapon, this later vehicle weighs only 5 tons more than T34/85. The T54 is currently being mass produced, and has been issued by the thousands to Soviet combat units.

### Heavy Tanks

The powerful Joseph Stalin-3 (JS3) heavy tank incorporates two conspicuous departures in armor arrangement that are entirely new in tank design. The first is the prow-shaped front hull; the second is the turret which is the first *turtle-back* design on a standard tank. Both of these features give added emphasis to the superior nature of Soviet tank design. The main armament of this vehicle consists of a modified 122mm field gun which has been adapted to armor usage, giving the JS3 the largest caliber gun of any standard tank in existence. The fact that the Russians saw fit to consign a number of these vehicles to the Egyptians prior to the Suez dispute suggests the pos-

sibility that it is being replaced, inside Russia, by a later model heavy tank. (Ed. NOTE:—These were on display at the Armed Forces day parade in Moscow.)

### Self-Propelled Assault Guns

During the early stages of their battles with the German Army on the Eastern Front in World War II, the Russians recognized a need for self-propelled (assault) artillery pieces. As a result, self-propelled assault guns assumed their role as major weapons in the Soviet arsenal of arms in early 1943, and they have been used extensively ever since.

Soviet self-propelled assault guns consist of adaptations of standard

field, tank and antiaircraft guns mounted on standard or slightly modified tank chassis. By retaining the same general characteristics as their parent guns and chassis, development of these vehicles is greatly facilitated. In the mind of the Soviets, it appears that the end product is a composite type assault gun well able to exist on the battlefield in face of antitank opposition. The trend in the development of these vehicles is toward large caliber guns on medium to heavy tank chassis.

The primary role of the Soviet assault gun is to accompany tanks and provide direct fire on targets which hinder the advance of the tanks. While the assault gun lacks the flexibility of its main armament which the revolving turret provides for the tank, the Soviet tactical concept appears to require the increased destructive power of its main gun.

Early in 1943, the Russians issued the SU37, a 37mm antiaircraft gun on a modified version of the obsolete T70 light tank chassis. This was closely followed by the SU76, the same chassis mounting a 76mm gun. The SU37 was designed for protection of column movements and for normal antiaircraft roles. The SU76 was designed for tank destroyer missions. Both vehicles have since become obsolete. The SU37 was last seen in the Moscow parade of 1946 and the SU76, not possessing enough power to combat heavy tanks, was relegated to a role of supporting artillery for infantry. Since the early 1950s, almost all of the SU76 assault guns have been issued to satellite nations.

### COMPARATIVE CHARACTERISTICS OF SOVIET TANKS

|                                 | T34/85         | T54         | JS3                        |
|---------------------------------|----------------|-------------|----------------------------|
| Weight (tons)                   | 35             | 40          | 51                         |
| Crew                            | 5              | —           | 4                          |
| Engine                          |                |             |                            |
| Type                            | V-12 diesel    | V-12 diesel | V-12 diesel                |
| Horsepower                      | 493 @ 1800 RPM | 500         | 592 @ 2000 RPM             |
| Maximum speed                   | 35             | 30          | 23                         |
| Cruising Range                  | 186            | 230         | 156                        |
| Armament                        |                |             |                            |
| Primary                         | 85mm           | 100mm       | 122mm                      |
| Secondary                       | 2-7.62mm MG's  | —           | 1-12.7mm MG<br>1-7.62mm MG |
| Ammunition carried<br>(Primary) | 56 rds         | —           | 28 rds                     |





(U. S. Army)

The JSU self-propelled gun was given to the Satellites.

Obsolescence of these vehicles marked the departure from the light tank chassis and small caliber guns for Soviet self-propelled artillery pieces.

The SU85, an 85mm anti-aircraft gun mounted on a T34 tank chassis, assumed a primary role as a tank destroyer. After World War II, this vehicle was classed as obsolete and since then has been seen only in the armies of satellite nations. Its principle fault was the fact that it was too lightly gunned to compete with the German heavy tank.

The self-propelled assault gun retained as standard with the smallest caliber gun is the SU100 (M1944), mounting a 100mm field (anti-tank) gun on a T34 tank chassis.

One of the assault guns most heavily relied upon by the Russians is the JSU122 (M1943), a 122mm tank gun mounted on the Joseph Stalin (JS) heavy tank chassis. It is rugged, reliable, and used predominantly as an assault artillery piece. In the 122mm gun field, it is quite probable that the Soviets will also mount this gun, or a later version, on the T54 tank chassis, the tank which performed so capably in the Budapest campaign last year. Models of an earlier version of the 122mm assault gun, the JSU122 (M1931/7) have been turned over to satellite nations. These earlier models are most readily distinguished from the JSU122 (M1943) by their lack of a muzzle brake.

The largest gunned self-propelled

artillery piece in the Soviet arsenal is the JSU152. This vehicle incorporates the Joseph Stalin heavy tank chassis and 152mm gun-howitzer. Its 12 baffle muzzle brake and larger caliber howitzer tube distinguish it from the JSU122. It is a rugged, flexible and dependable vehicle.

#### Personnel Carriers

The Russian Army makes extensive use of armored personnel carriers in infantry and armored-infantry units. In the past, the great majority of those carriers have been of

the 4x4 and 6x6 pneumatic type. (Ed. NOTE: Tracked APCs were also exhibited in the 7 November parade)

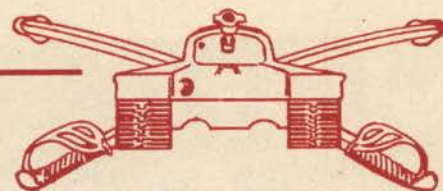
#### Summary

Consideration of the foregoing information makes it apparent that the Russians heartily subscribe to the theory that the most expensive piece of equipment on the battlefield is the *second-best* tank. While Russia is doubtless concentrating proper effort upon the development of revolutionary, unconventional weapons for the warfare of the future, it is significant that in the Soviet Army *today*, the USSR has amassed great quantities of modern, effective armored equipment, ready at any time for utilization according to Russian tactical concepts, as demonstrated during World War II. Russian tanks are neither too few nor of inferior design. The USSR realizes that for many years to come the preponderance, operational effectiveness and proper employment of Armor will continue to decide battles just as it did during World War II. Present organization and types of equipment in the Soviet Army, with emphasis constantly being exerted on the further improvement of the types of equipment described in this article, certainly indicate that Russian leaders still subscribe to the theory that Armor is destined to fulfill an important role in future warfare.

#### CHARACTERISTICS OF STANDARD SOVIET SELF-PROPELLED ASSAULT GUNS

|                              | SU76             | SU85           | SU100          | JSU122         | JSU152         |
|------------------------------|------------------|----------------|----------------|----------------|----------------|
| Weight (tons)                | 12.3             | 32.5           | 33.1           | 51             | 51             |
| Crew                         | 4                | 4              | 4              | 5              | 5              |
| Engine:                      |                  |                |                |                |                |
| Type                         | Two 6 cyl diesel | V-12 diesel    | V-12 diesel    | V-12 diesel    | V-12 diesel    |
| Horsepower                   | 132 each         | 493 @ 1800 RPM | 493 @ 1800 RPM | 592 @ 2000 RPM | 592 @ 2000 RPM |
| Maximum speed                | 28               | 35             | 30             | 23             | 23             |
| Cruising range               | 225              | 190            | 190            | 156            | 156            |
| Armament:                    |                  |                |                |                |                |
| Primary                      | 76mm             | 85mm           | 100mm          | 122mm          | 152mm          |
| Secondary                    | None             | None           | None           | 1-12.7mm       | 1-12.7mm       |
| Ammunition carried (Primary) | 60               | 48             | 34             | 30             | 20             |





# news from THE US ARMY ARMOR SCHOOL

## The Forward Look in Armor Logistics "Division Forward Distributing Points"

Prior to the current reorganization of the field army, from which has evolved the ROCAD Armored Division, the ROCID Infantry Division and the ROTAD Airborne Division, one basic principle of logistics has never been completely adhered to. This important principle, "The Impetus of Logistics is from REAR to FRONT," was designed to relieve the commander from having to fight on two fronts—the enemy in front of him and for his logistical support in

his rear. Unfortunately the advocates of supply point distribution, in which the commander must constantly send back to the REAR to get his required supplies, have long been in the ascendancy. Today, however, there is a change in the concept. The "supply point closed-shop" concept is breaking up and we are in fact starting to put into practice this basic principle which pushes logistical support forward to the user. The divisions must still go back to Army for classes III and V supplies. However, Army delivers classes I, II and IV supplies to the divisions. The Armored Division delivers classes I,

II, III and IV to its subordinate units. The Armored Division achieves this forward look in logistical support of its units by establishing division class I and class III forward distributing points in each combat command train area and making unit distribution of class II and IV supplies. (Figure 1.)

Resupply procedures for class V supplies have not changed as a result of ROCAD.

The detailed operation of this new concept is contained in FM 17-50 "Armor Logistics," which is presently being written and should be published by the summer of 1958.

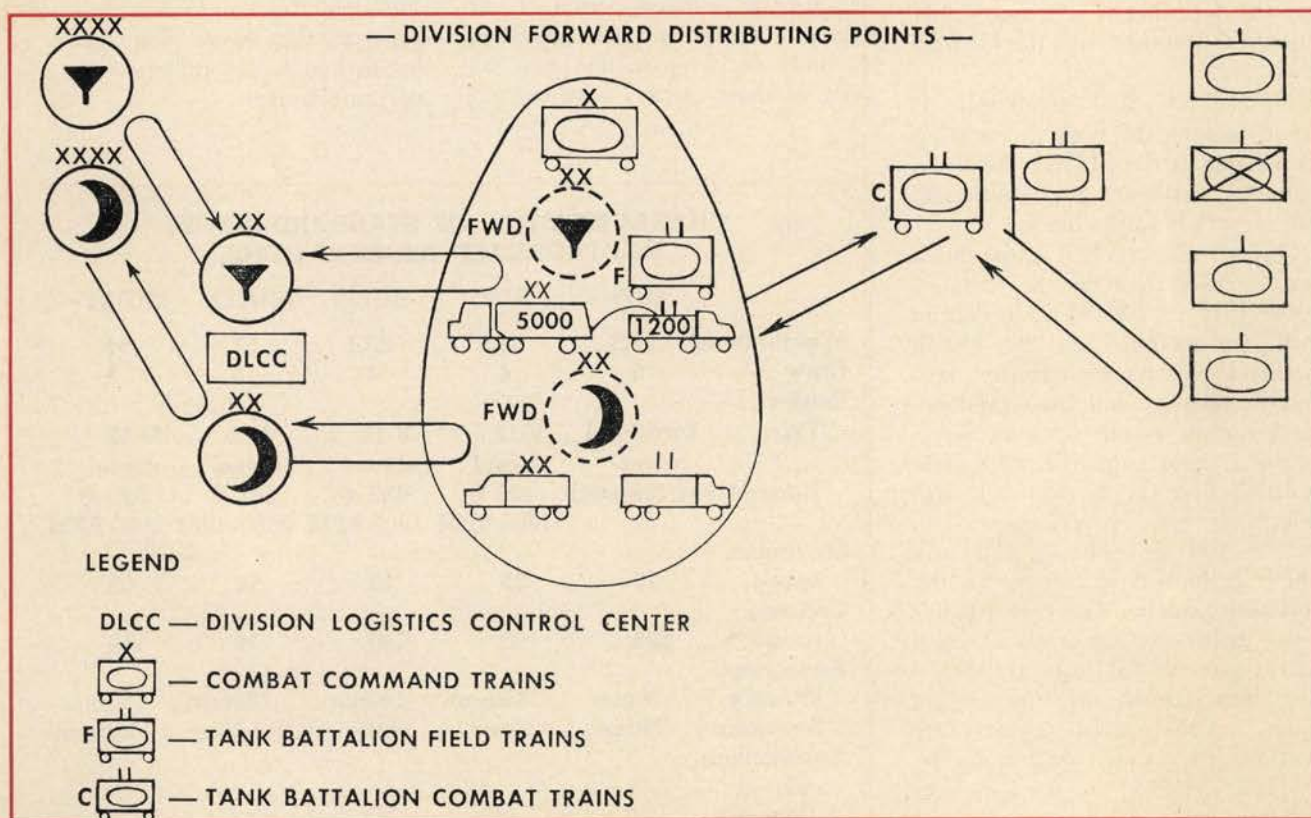


Figure 1



## Solar Battery Power

One of the many outstanding achievements in recent years is the application of the "solar battery" to the practical production of useful electrical power directly from solar energy. The solar battery was taken out of the experimental classification about two years ago when it was used to supply power to charge telephone batteries on a telephone line near Americus, Georgia. Since that time much effort has gone into research and development to improve this device so that it could be adapted for other uses.

As a result of this research the United States Army Signal Engineering Laboratories, Fort Monmouth, New Jersey, have constructed an experimental helmet-housed radio which is powered by sunlight. The helmet radio contains long, narrow clusters of tiny silicon wafers, or solar batteries, grouped on the crown of the helmet. All the electrical power necessary to operate the radio can be obtained by simply exposing the helmet to sunlight. Use of solar cells in combination with nickel-cadmium storage batteries will provide power for day and night-time use. The solar cells can provide power for operation of the radio for as long as a year, as compared with dry cell life measured in hours.

## T37 Unit Leaves Knox as Tests Are Completed

The Santa Maria, Nina and Pinta, the three T37 Jets of Project Long Arm, disappeared into the skys over Fort Knox recently with the same speed and grace which distinguished their arrival.

Good weather allowed Test Unit T37 to complete its tests at Fort Knox earlier than anticipated. The group departed for Fort Rucker, Ala. before beginning a new series of tests at Fort Benning, Ga.

The tests, which began in November, have covered a number of situations which might be found in actual combat. The purpose of the tests has been to determine what use, if any, higher performance aircraft

can be for Army reconnaissance and artillery fire adjustment missions.

One of the last tests undertaken by the unit was a long range situation which involved flying from Fort Knox to Camp Breckinridge and observing the land on the route for possible enemy troops. The results of this test, like those of the others, will be evaluated by a team headed by Lieutenant Colonel James H. W. Treadwell, U. S. Army Armor School.

## Team Will Evaluate Tests

The evaluation team will evaluate the tests from the standpoint of route

reconnaissance, air reconnaissance, area cover, etc. Each test will be taken under careful consideration and the results will be passed on to higher headquarters.

The observers who took part in the test were from the U. S. Army Armor School. They were either graduates from the Observer School at Fort Rucker or light aircraft pilots. Prior to each test, the observers and pilots were briefed on the test situation and debriefed after the mission. During the tests, observations were made from altitudes, generally, under 1,000 feet.

## THE U. S. ARMY ARMOR SCHOOL HONOR GRADUATES

The following students received top scholastic honors of their classes (listed in order of standing in the class):

### Associate Armor Officer Advanced Course Nr 4

Capt. Roger F. Ash, 4th Armd Div, Fort Hood, Texas; Maj Helmut J. Haag, Hq 205th Tk Bn, New York NG, Troy, New York; Capt Lester C. Bennett, 44th Tk Bn, Fort Bragg, NC.

### Armor Officer Basic Course Class Nr 15

2d Lt Wm. J. Johnson, USATC, AAA, Fort Bliss, Texas; 2d Lt Richard W. Brandt, USATC, Inf (6003-01), Ft Ord, California; 2d Lt Robert K. Bergman, USATC, Engr (5017), Ft Leonard Wood, Missouri.

### Armor Officer Basic Course Class Nr 1

2d Lt Dale K. Brudvig, 1st Armd Div, Ft Polk, Louisiana; 2d Lt Alan B. Buchan, 2d Armd Div, Ft Hood, Texas; 2d Lt Richard L. McDowell, 1st Inf Div, Ft Riley, Kansas.

### Armor Advanced Non-Commissioned Officer Course Class Nr 1

MSgt Neil P. Farmer, Co C 1st Med Tk Bn 68th Armor, 3d Inf Div, Ft Benning, Ga.; Sfc Miles L. Allen, Co D 2d Bn 6th Armd Cav, Ft Knox, Kentucky; MSgt Alexander I. Shabalin, Trp A 2d Recon Sq 15th Cav, 4th Armd Div, Ft Hood, Texas.

### Armor Communication Supervision Course Class Nr 2

Sgt George N. Carman, 1st Med Tk Bn 69th Armor, Ft Riley, Kansas; Sgt Paul M. Luttio, Hq & Hq Det 40th Armd QM Bn, California NG, Los Angeles, California; Sgt Bobby Thompson, Hq & Hq Trp 2d Recon Sq 8th Cav, Ft Lewis, Washington.

### Armor Track Vehicle Maintenance Course Class Nr 15

Pvt Kenneth C. Fish, 4th Armd Div, Ft Hood, Texas; Pvt Wilhelm F. Sangen, USA OR Sta (1264), Ft Dix, New Jersey; Pvt Carl B. Knapp, USA OR Sta (1264), Ft Dix, New Jersey.

### Armor Turret Maintenance Course Class Nr 1

Pfc Daniel F. Garrahy, 38th Recon Bn, Ft Knox, Kentucky; Pvt Robert C. Stone, 4th Armd Div, Ft Hood, Texas; Sp2 Charles A. Crissman, Co B 104th Armd Cav, Pennsylvania NG, Sunbury, Pennsylvania.



# How Would You Do It?

## AN EXERCISE IN LEADERSHIP

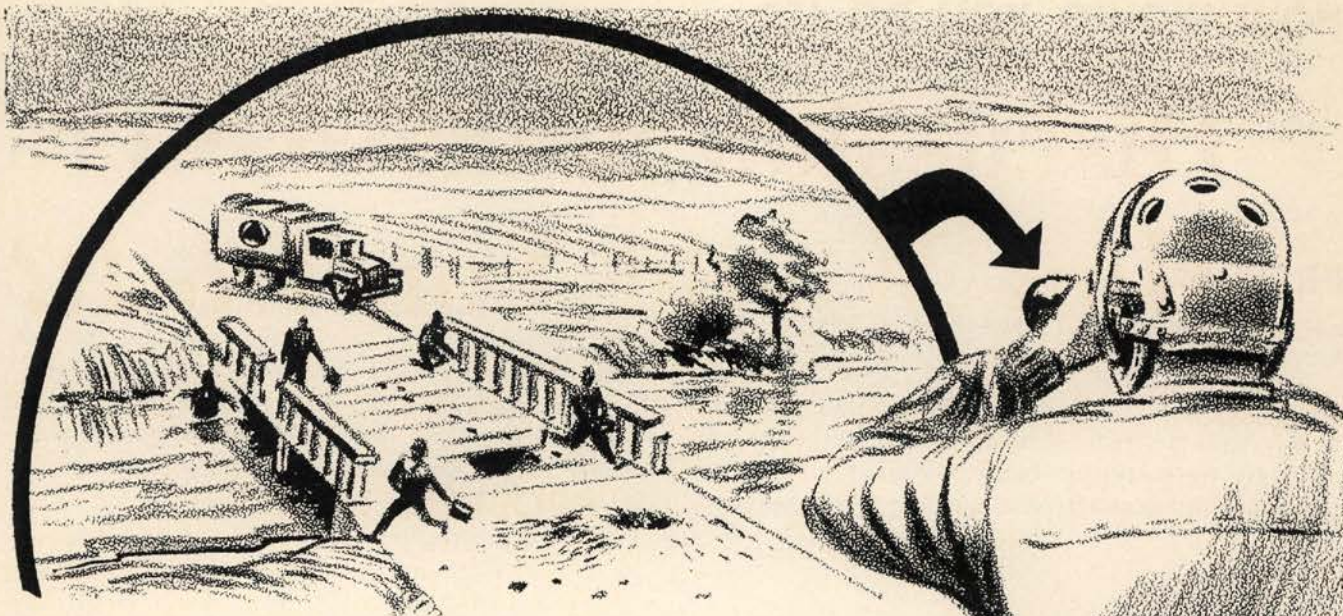
### PROBLEM 1

You are a platoon leader in a tank company located in an attack position. Five minutes before H-hour your radio becomes inoperative. Your loader, who has been to radio repairman school, says that he thinks he can fix the radio in about three minutes.

### WHAT WOULD YOU DO?



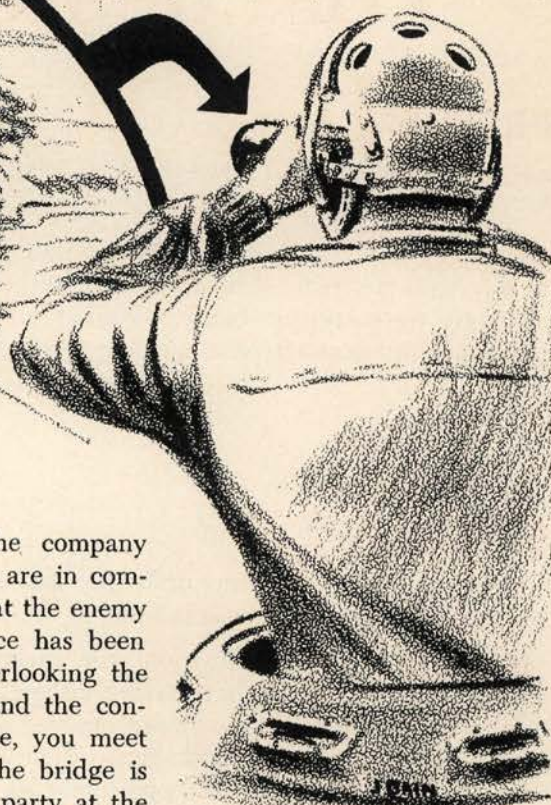




## PROBLEM 2

The enemy withdraws, and the advance continues. The company commander and executive officer having become casualties, you are in command of the tank company team. Air observers have reported that the enemy is retreating and that a distant bridge on your axis of advance has been destroyed. You are ordered to occupy commanding terrain overlooking the bridge site and then to support the construction of a bridge and the continuation of the attack. During your advance to the bridge site, you meet only scattered resistance. On your arrival, you discover that the bridge is still intact; at the same time you observe an enemy demolition party at the bridge.

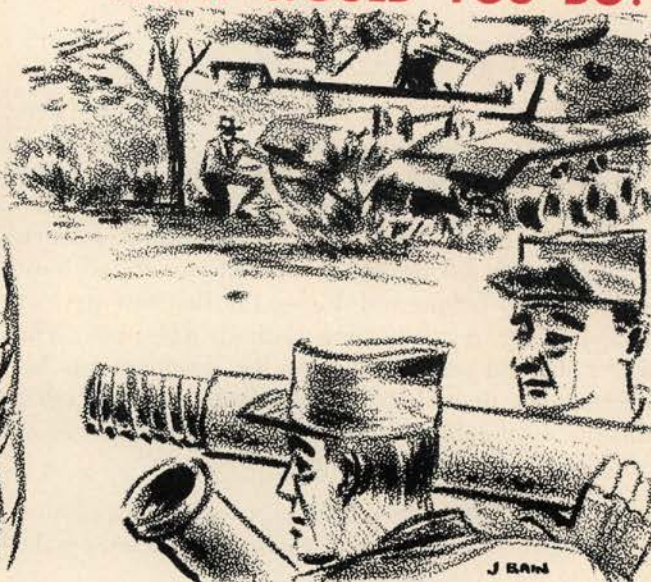
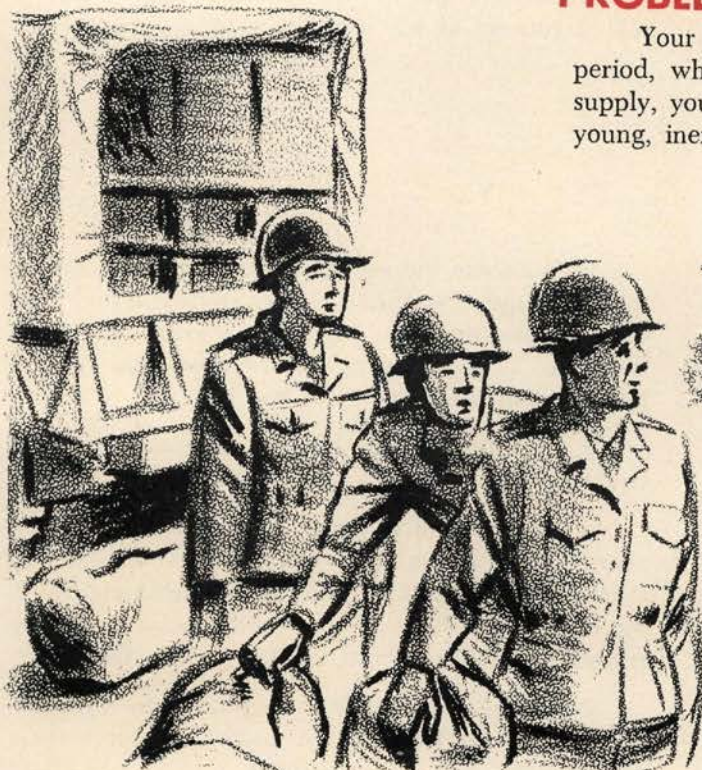
**WHAT WOULD YOU DO?**



## PROBLEM 3

Your unit has been given a rest of one day. During this period, which is being used mostly for maintenance and re-supply, you receive three replacements. They are all privates, young, inexperienced, and quite nervous.

**WHAT WOULD YOU DO?**





# Discussion and Answers

## PROBLEM 1

**ANSWER:** Move to a tank with a radio that is operative.

**DISCUSSION:** The tank unit leader must be able to communicate freely if he is to exercise the control necessary for success in battle. Without a radio, he is without his most effective medium of communica-

tion. In this situation, you would move immediately to a tank whose radio is working, avoiding the risk of the inoperative radio not being repaired in time. The tank containing the inoperative radio can still be fought from and, commanded by the tank commander whom you displaced, will accompany the platoon.

## PROBLEM 2

**ANSWER:** Take the enemy under fire and seize the bridge, notifying higher headquarters of the situation.

**DISCUSSION:** In this situation, you must decide whether to obey your orders, having discovered that these orders were based on a false premise (that the bridge was destroyed), or to disregard them by capitalizing on the unsuspected opportunity of seizing the bridge intact. Keeping in mind that your orders are merely to secure the dominating terrain on the near side of the bridge site, you weigh the alternatives. You consider the possibility that the bridge is prepared for demolition and may be blown up as the company crosses—or after it crosses. On the other hand, you realize that the presence of the undamaged

bridge so late in the battle is evidence that the retreating enemy is too disorganized to prevent its seizure or subsequent exploitation. The seizure of the bridge would mean great savings in equipment, in effort, and, most important, in time—time the enemy could well use to reorganize and to stiffen his resistance. This new course of action, once begun, could easily be countermanded by higher headquarters if circumstances unknown to you required it, but the opportunity to take the bridge, once lost, could not be regained. The armor leader must be prepared to act decisively and boldly, without taking counsel of his fears.

## PROBLEM 3

**DISCUSSION AND ANSWER:** Replacements, particularly those entering combat for the first time, should be of the greatest concern to the leader. The binding forces of esprit de corps, confidence, morale, and the feeling of belonging, so important to men in combat, are not present in the newcomer and must be developed before and during the first few days of combat if he is to become lastingly effective. The leader can do much to foster his development, his efforts being limited only by the exigencies of combat and the availability of time. If at all possible you as company commander should:

a. Prior to the arrival of the replacements, remind the veterans in the unit that you expect them to make the new men feel welcome.

b. Welcome the replacements personally; talk to them at length about their backgrounds and their new unit. In so doing, you will learn a great deal about them and at the same time show them that you are interested in them and their welfare.

c. Ensure that they have all necessary personal equipment.

d. Assign them to positions under the most capable NCOs. In doing this, which may necessitate the reorganization of some already well-functioning teams, the advantages outweigh the disadvantages. Further readjustments, if required, can be made in the future.

e. During the first few days after their assignment, whenever the situation permits, observe these men at work and speak to them.



# NEWS NOTES

## Draper Trophy Winner for 1957

The 1st Platoon, Company B, 2d Medium Tank Battalion, 33d Armor won the 1957 Armor Leadership Award competition conducted by the 1st Armored Division.

Commanded by Second Lieutenant Gary L. Clark, the platoon defeated platoons from four other armored units of the 1st Armored Division by scoring 1,649.40 points out of a possible 2,325 points.

The Armor Leadership Award competition, a rugged test of the combat readiness and effectiveness of a tank unit, is held each year by units of a selected armored division. Platoons taking part in the contest were selected by competition in their battalions.

Although the test normally requires slightly less than two days for a platoon to complete, adverse weather conditions hindered this year's competition. Originally scheduled for November 18 through 23, heavy rains and subsequent mud delayed the contest. Testing got under way November 19 only to be cancelled by rain and heavy ground fog three days later. After being suspended from November 22 through 24, the competition was concluded November 27.

Included in the test were eight events, each controlled and scored by trained and impartial personnel. The competition included physical fitness test for each man in the platoons, running the military stakes course, individual weapons firing, a combat readiness inspection, a tactical phase, the individ-

ual tank course, tank-infantry combat course and a post-operation inspection.

Platoons received a numerical rating for each phase of the test, with the total score for all events determining the winner.

Final platoon scores were: 1st platoon, Company B, 2d Medium Tank Battalion, 33d Armor, 1649.40; 3d platoon, Company A, 1st Tank Battalion, 1st Cavalry, 1634.46; 1st platoon, Company B, 2d Tank Battalion, 32d Armor, 1605.26; 1st platoon, Troop B, 1st Reconnaissance Squadron, 12th Cavalry, 1541.24; and the 1st platoon, Company C, 1st Tank Battalion, 13th Cavalry, 1498.01. The highest possible score was 2,325 points.

In congratulating the winner and runners-up, Major General Edward G. Farrand, Fort Polk and 1st Armored Division Commander, noted that all 25 competing tanks completed the competition and were present for the post-operational inspection, in spite of the difficult weather and terrain conditions.

The Armor Leadership Award trophy was presented to the winning platoon at the 1st Armored Division review December 14. The platoon will keep the trophy for one year.

The company of the winning platoon will be presented a wall plaque while a silver bowl will be awarded to Second Lieutenant Clark, platoon leader, and a silver tray will be presented to Master Sergeant John A. Carlson, platoon sergeant. Men of the platoon will each receive an engraved wrist watch.

The Armor Leadership Award was

originated in the mid 1920's with a donation from Colonel Wycliffe P. Draper, a wealthy horse fancier. The test was originally called the Cavalry Leadership Test for small units, and, as today, tested a lieutenant and his platoon acting alone.

The test was suspended during World War II and again during the first two years of the Korean conflict. With the disappearance of cavalry from the U. S. Army following the end of the second World War, the award was passed on to the mobile arm, armor.

## Army to Activate Third Redstone Unit

The Army's third operational REDSTONE unit, the 2d Battalion of the 333d Field Artillery, will be activated at Fort Sill, Oklahoma, February 1, 1958, the Department of the Army announced recently.

Activation of the 2d Battalion, 333d Artillery, will be the initial step in the formation of another Field Artillery Missile Group (Heavy) employing the REDSTONE missile. Forming the headquarters of the new missile group will be Headquarters and Headquarters Battery, 46th Field Artillery Group which is scheduled to move from Fort Bliss, Texas to Fort Sill in late March, 1958.

When fully organized the REDSTONE missile group will contain approximately 600 men and will include Ordnance and Engineer units as well as the basic missile unit. The Army activated its first REDSTONE group, the 40th Field Artillery Missile Group (Heavy), in July, 1957, at Redstone Arsenal, Huntsville, Alabama. A second REDSTONE Battalion, the 4th of the 333d Field Artillery, was activated at Fort Sill on October 1, 1957.

## TV Show Depicts the History of the Cavalry

One of the Army's big picture series, soon to be released, will depict the history of the Cavalry from the early days up to and including the inheritance by Armor of these early traditions and honors.

The film can be identified by the number, TV-382. It is suggested that local public information officers contact their local television stations so that full publicity can be given in their areas. This film should serve to stimulate recruiting for Armor units of all components. It is also suggested that it might be possible to borrow the film for special showings. Most stations will carry the film in early January. However some stations will not show the film until the Spring.

## COMMAND CHANGE



(U. S. Army)

Major General Robert W. Porter  
Department of the Army



(U. S. Army)

Brig. General Thomas F. Van Natta  
CG, 3rd Armored Division



L. to R. Lt. Col. W. H. Zierdt, Jr., The Honorable Wilber M. Brucker, General Maxwell D Taylor, and Brig. Gen. Frank H. Britton.

#### The inscription

*Presented to ( . . . ) by The Armor Officers of the U. S. Army on the occasion of the 181st Anniversary of their branch.*



(U. S. Army)

## Commemorating the 181st Anniversary

On the occasion of the 181st Anniversary of Armor, 12 December 1957, many festivities were held at various Armor installations around the world. In Washington, D. C., all Armor officers and their guests assembled at Fort Myer, Virginia, for a dinner-buffet. The 2d Armored Cavalry Regiment, soon to depart Fort Meade, Maryland, for Germany, sent their guidons, standards and Color Guard to help grace the Main Ballroom of Patton Hall, in all the dignity, splendor and heraldry of that famous old regiment. The Secretary of the Army, the Honorable Wilber M. Brucker, and the Chief of Staff, General Maxwell D. Taylor, due to other commitments, were unable to attend. However, they were presented beautiful prints of General Adna R. Chaffee in the Secretary's office a few days later. A similar ceremony was held at Fort Monroe, where General L. L. Doan, representing all Armor officers of the Army, presented a similar print to General Willard G. Wyman, CG, USCONARC

and President of the U. S. Armor Association.

The inscriptions on the pictures are shown left above. A quote by General Chaffee printed on the pictures shown right below.

General Frank H. Britton, R&D, D/A and your Association Secretary represented the Armor officers in presenting pictures here in Washington. Upon receiving his picture, Mr. Brucker stated that he "received this picture of General Chaffee with a great deal of enthusiasm and pride. The Army is grateful to General Chaffee for his contributions during his service. In fact there is an Army installation named in the honor of General Chaffee."

General Taylor recalled when he was a student at Fort Leavenworth in 1934 that General Chaffee, then commanding the First Cavalry (Mechanized), put on a demonstration at Leavenworth during a march from Fort Knox to Fort Riley. He stated that Armor and the Army had certainly grown since that time.



(U. S. Army)

L. to R. General Willard G. Wyman, Maj. Gen. L. L. Doan and Maj. Gen. Paul A. Disney.

#### The quote by General Chaffee

*"It is often said, and it may be true in the abstract, that the principles of war do not change. It is, nevertheless, absolutely true, that methods do change and are constantly changing. We may study the great captains of the past to learn of their principles and, above all, of their character, but do not let us be tied too much to their methods. For methods change with every change of armament and equipment."*



## Army Missile Master Air Defense System Put into Operation

MISSILE MASTER, the first fully operational electronic air defense control system in the United States, was put into action on 5 December by the Army Air Defense Command.

Located at Fort George G. Meade, Maryland, MISSILE MASTER will help defend the Washington-Baltimore government-industry complex against air attack. It is an electronic system which controls and coordinates the fire of the Army's air defense weapons to insure their maximum effectiveness. Targets can be selected economically, with control of each NIKE missile being retained by local battery commanders. In this way, preselected targets in an attacking air fleet are assigned for destruction by Missile Master to individual batteries of a NIKE network.

This first MISSILE MASTER installation is operated by the 35th Antiaircraft Artillery Brigade. The Army said that the next MISSILE MASTER systems to become operational will be for the New York City defense area and other strategic, industrial and population centers across the nation.

Prior to MISSILE MASTER, the antiaircraft batteries were controlled and coordinated by voice telephone from a central defense command post where targets were plotted manually on a map of the area.

The increase in speed of aircraft and the high accuracy of the NIKE missile has necessitated the development of a rapid, automatic, electronic system for transmission and coordination of information. MISSILE MASTER relays a tactical decision of a weapons battery commander or the defense commander to all other commanders in the area as soon as it is made.

MISSILE MASTER electronically stores all information on targets in the area and presents it on a TV-like picture tube in a simplified form. This is in addition to its instantaneous transmission function.

Although MISSILE MASTER operates independently, it also has the capability of coordinating the fire of the NIKE batteries in cooperation with the U. S. Air Force SAGE interceptor aircraft control system in the overall defense of the continental U. S.

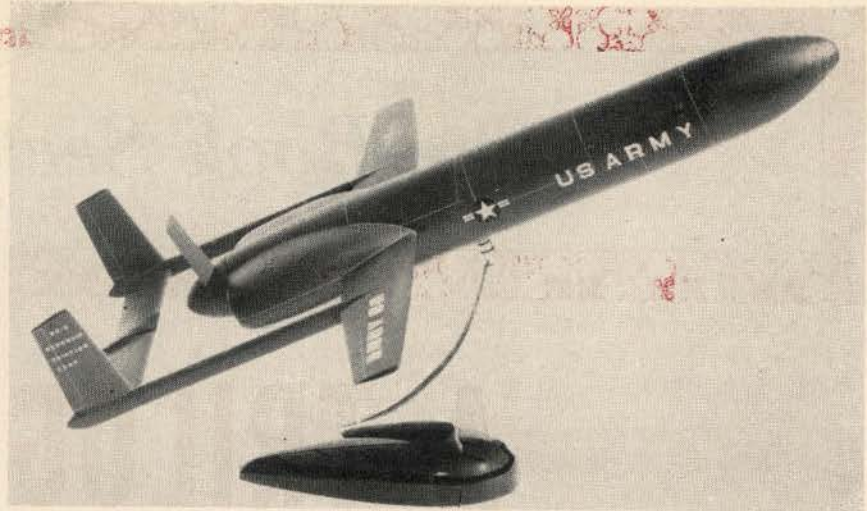
### No Additional Force-outs

The Army announced recently that it will not make any additional forced separations of officers in achieving its year end strength for Fiscal Year 1959.

First half of Fiscal Year 1958 involuntary releases remain unchanged. These releases will be completed as indicated by orders received by individuals concerned. All have already been notified.

The reduced strength for Fiscal Year 1959 will be reached without forced separation by a combination of reduced procurement, normal attrition, and other normal administrative procedures.

**ARMOR—January-February, 1958**



(U. S. Army)

This is the Army's newest surveillance drone, the SD3. Using advanced sensory devices, it is an all-weather system. It is launched by JATO and is recoverable.



The harmless looking box this British "Tommy" is carrying is in reality an anti-tank weapon. The metal box actually houses a missile which is launched by the operator's sight controller, no other power being required. Using the sight controller, the operator can position himself close to a number of missiles and fire them in succession with only a few seconds delay between his launchings.



This is the HARRIER, a new British vehicle. It is an air transportable, general purpose vehicle which seats four and weighs only 6¼ cwt. (317.5 kgs) and when it is folded occupies only 33 cubic feet. An additional saving in airlift resources results from the fact, when they are folded, these general purpose vehicles can be stacked one on top of another without the need for supporting racking.



# The Book Section

## A TRILOGY

By BRUCE CATTON

*These reviews of three well-known books are more than the ordinary book review. They sum up as an objective analysis of all Civil War books and should serve to stimulate all students of the military into the reading of the best Civil War histories. ARMOR is pleased to deviate from its usual routine of featuring an exclusive review to bring this reprint to you.*

**MEMOIRS OF GENERAL WILLIAM T. SHERMAN:** By Himself. Foreword by B. H. Liddell Hart. Two vols. in one, 405 and 409 pp. Bloomington: Indiana University Press. \$8.

**NUMBERS AND LOSSES IN THE CIVIL WAR IN AMERICA: 1861-65.** By Thomas L. Livermore. Introduction by Edward E. Barthell, Jr. 150 pp. Bloomington: Indiana University Press. \$4.50.

**GRANT AND LEE: A Study in Personality and Generalship.** By Maj. Gen. J. F. C. Fuller. 323 pp. Bloomington: Indiana University Press. \$5.

These excellent book reviews appeared in the *New York Times Book Review* on November 10, 1957 and are reprinted here with the kind permission of both the Reviewer and the Editor of the Book Review.

books in the field have been available for many years.

Perhaps the word "available" needs to be qualified. Most of the Civil War classics are long since out of print. They can be found, of course, in public libraries, but to buy them usually involves examining the shelves of many used-book dealers. This takes time, and now and then it is quite expensive. Fortunately, publishers, who have discovered that almost any Civil War book will sell nowadays, have reflected that the old stand-bys might sell also, if someone bothered to reprint them. As a result, we are at last beginning to get a considerable

number of reprints of Civil War classics, of which the three books listed at the head of this column are examples. Each is published as a title in the Civil War Centennial Series of Indiana University.

These books are in the great tradition; that is, they will be reference books for students a century from now, and they are also books that can be read with much enjoyment by the man who does not pretend to be a student but who just wants to know what the shooting was all about. They are very different, these three, and to label them as classics is to do no less than bring up the question: Just what is a Civil War classic, and how does it get that way?

In the established canon of Civil War literature some books stand out. Of these, a few are memorable simply because they are excellent pieces of literature, which is to say that they are well written by perceptive and sensitive men who knew how to handle the English language. Others are books by participants, who somehow managed to tell what they were up to in terms that can be comprehended later. Still others are books of careful

**C**ONTRARY to general impression, the literary discovery of the Civil War did not take place within the last decade. Civil War literature is nearly a century old, and it has its established classics—books that, for one reason or another, stand out as genuinely important and will continue to be read long after most of our current output has been quietly forgotten. With a very few exceptions the really notable



scholarship, the fruit of much study and analysis, which dissect some aspect or incident of the war and show what the facts behind it really were. And some, of course, are just books—works which for no really obvious reason somehow last and speak to us now in terms we cannot forget. There is a mystery about such things, and a few of the Civil War classics share in it.

What these classics have in common is the ability to take one part of the greatest national experience this country ever had and show it to us so that we get a little added understanding out of it. Sometimes this added understanding has to do with cold facts—how many men did this and that, what moneys were involved in such-and-such a deal, how many votes were cast here and who tabulated them and where did they come from? At other times these books that go on living give us a measure of emotional understanding—which, since the war was a matter of emotions to begin with, and to end with, is perhaps the most important of all. And now and then a man who was actually in the war sets down what he saw and felt and did, and puts us in touch with the spirit of the person who stood under the gun at the moment when (to change the metaphor slightly) everything was riding on the next pitch.

These books are various. One classic, certainly, is the "Personal Memoirs" of Gen. U. S. Grant; another,

completely different, is the four-volume Battles and Leaders set. Still another is the star-crossed little book, badly overwritten but immensely compelling, called "The Battle of Gettysburg," by Lieut. Frank Haskell, who scribbled his account less than two weeks after the battle and who got a bullet in his brain, and died of it, ten months later at Cold Harbor. Stephen Vincent Benét's "John Brown's Body" certainly belongs on the list—this poet can put you in closer touch with what the war cost and meant than any number of sober historians—and, with all of their faults, so do Mary Johnson's "The Long Roll" and "Cease Firing," novels which are badly dated but which still have the pulse of life in them.

With "Jeb Stuart," Col. John W. Thomason goes on the list, along with G. F. R. Henderson's marvelous "Stonewall Jackson" and Joshua Chamberlain's evocative account of what went on in the 20th Maine infantry. (Put close to that the modern work, John Pullen's "The Twentieth Maine"; one need not actually have fought in the Civil War, apparently, in order to understand what it meant to the people who were in the middle of it.) Add the four volumes of Carl Sandburg's magnificent prose poem on Lincoln, and the four of Freeman's on Lee—the latter a set which suffers slightly because one Virginia gentleman, writing about another Virginia gentleman, is bound to cut some corners here and there, but which never-

theless presents Lee as fully as anyone will ever do it.

Of the three reprints presented here, Gen. William T. Sherman's "Memoirs" is a book that will survive as long as anyone is interested in the tragic convulsion of the Eighteen Sixties. It happens now and then that an author does more than he thinks he is doing when he writes a book, and this was the case with Sherman. In a way, he lowered the boom on himself—which is to say that he elected himself one of the great villains of the piece as far as the Southland is concerned.

Sherman went through Georgia and the Carolinas like the wrath of God and put a scar on the land for remembrance. But he sympathized with the South rather than with the fire-eaters of the North; and when Gen. Joseph E. Johnston surrendered, Sherman gave him terms so liberal—they amounted to a reconstruction of the Union on an all-is-forgiven basis and would have permitted the Southern regiments to march happily back to their state capitals and deposit their weapons there, where they could handily get at them at some later date as need might arise—that Washington immediately disowned him and his treaty and denounced him as the next thing to a traitor. Immediately after the war, Sherman was actually a well-liked character in Dixie; he had fought a hard war but he did his best to make a soft peace, and he was respected for it.



## THE REVIEWER

Mr. Bruce Catton is the well-known editor of *American Heritage*. A graduate of Oberlin College, Oberlin, Ohio and holder of numerous Literary Degrees, he was a newspaper reporter for 20 years. He served as Director of Information for the War Production Board during World War II. Subsequent to the War he served in the same capacity with the Department of Commerce. He recently completed a trilogy on the Civil War, the most famous being *A Stillness at Appomattox*, for which he received the National Book Award and the highly coveted Pulitzer Prize.



Then, ten years later, he wrote his memoirs, and the picture changed. For Sherman was a hard-talk character—one of those American soldiers who say just a little more than they really mean, and have a way of saying it in the most offensive way possible—and what he said ran ahead of what he had actually done. He had gone through the South to devastate the Southern economy, a mission he performed with rare success, and although the job was done in a heavy-handed manner it did not actually kill very many Southerners. Lloyd Lewis (whose "Sherman: Fighting Prophet" is another of the Civil War classics) has remarked that you can stir up more ill will by burning barns than you can by killing young men. The big trouble was that in his memoirs Sherman treated the whole business as a grand lark—or, alternatively, undertook to speak as an Old Testament personage denouncing erring men for willful sin.

Thus he could write—to the Mayor of Atlanta, protesting against Sherman's order to get all the civilians out of town so that the place could con-



(National Archives)

General William T. Sherman

veniently be destroyed—"You might as well appeal against the thunderstorm as against the terrible hardships of war." Preparing to go to Savannah, he could wire General Grant—and, later on, could exultantly reprint the wire—"I can make this march and make Georgia howl!" He could speak

of being "rather amused than alarmed" at the efforts patriotic Georgians made to delay him, and he could and did say coldly that he was fighting a hostile people "and must make old and young, rich and poor, feel the hard hand of war."

He could casually notify the Federal Chief of Staff, on his march through the Carolinas, that Charleston was likely to have a bad time of it: "The Fifteenth Corps will be on the right of the right wing, and their position will naturally bring them into Charleston first; and if you have watched the history of that corps you will have remarked that they generally do their work pretty well." The fact that in the end neither Sherman nor any part of his army got into Charleston made no difference. Here was a man who could toss off casual phrases about the total destruction of a great city without giving it a second thought, and the South was never able to forget it.

Anyway, Sherman wrote his book, and whether you consider him a great soldier or a pre-Hitler roughneck the book does remain as one of the classic



(Library of Congress)

Sherman went through Georgia and the Carolinas like the wrath of God and put a scar on the land for remembrance.





General Ulysses S. Grant

(Library of Congress)



General Robert E. Lee

(Library of Congress)

Civil War documents. It made Sherman the one man the South hated more than any other—except, perhaps, for Benjamin Butler, whom even ardent Northerners can detest—but it also is a book that lives, a thing with red blood in its arteries, an unforgettable narrative left by one of the first of the world's modern soldiers.

Very different is Col. Thomas Livermore's "Numbers and Losses in the Civil War in America." Colonel Livermore, a New Englander of the Eighteenth New Hampshire Regiment, addressed himself to one of the great mysteries of this otherwise well-documented war: Exactly how many men actually fought in it, on both sides, what happened to them and what was the butcher's bill in each of the major battles? He comes up with answers that do not quite fit into the tradition: he demonstrates that the Federal armies did not outnumber the Confederate armies nearly as much as is commonly supposed: he shows that battle losses on the Southern side were heavier than ardent Dixie patriots have been willing to admit, and he clears away a great deal of the sentimental rubbish that has hung over the whole business.

He shows, for instance, that Federal records indicate that just short of 2,900,000 men enlisted in the Union Army in the Civil War, and then goes on to ask: Just what did that mean in terms of men actually under arms? The total includes a great many

thirty-day and sixty-day militia enlistments, plus an enormous number of bounty men who enlisted anywhere from two to a dozen times and who performed very little actual service in return. Besides all of these there were the authentic veterans who re-enlisted and served out their time but who, on the records, go down as double their actual numbers.

By painstaking study Colonel Livermore finally came up with an informed estimate indicating that approximately 1,500,000 men actually served in the Union Army, as compared with slightly more than 1,000,000 men in the Confederate Army. Of the 2,500,000 men thus engaged about 600,000 died—in battle, of wounds and of disease. All of this took place in a nation that, North and South together, contained about 30,000,000 human beings. Extrapolate these figures into terms of modern America and you can see why the Civil War is still spoken of as the costliest war this country ever fought.

Gen. J. F. C. Fuller's book on

Grant and Lee cuts squarely across the accepted tradition. This British military man—who has an odd way of mixing straight discussions of strategy with speculations on the modern spirit and a slightly nebulous examination of whither-are-we-drifting—finds Grant a much better soldier than Lee. Lee, he feels, lacked the cutting edge, the capacity for hard decisions, the ability to stand on his own feet and do his job regardless of political considerations. The great Virginian, he says, was altogether too subservient to President Davis, never saw the war as a whole and was so poor an administrator that his army's famous lack of food, shoes and equipment can be blamed on its general rather than on Southern poverty.

All of this may prove nothing more than that General Fuller would be well advised to stay out of Virginia, but at least the man examines these two great soldiers from a fresh viewpoint and refuses to let himself be bound by tradition. In his final chapter General Fuller is capable of writing: "It was not because Lee placed Virginia before the Confederacy that he failed to be a grand strategist, a true General-in-Chief, but because he placed his sense of duty to God before all things." This remark does bespeak a different viewpoint, and while students of Grant and Lee and their campaigns may not follow General Fuller's ideas they are at least bound to take them into account.

*Feature Reviews*

*Exclusive with*

**ARMOR**



# **WINSTON CHURCHILL AND THE SECOND FRONT**

An expert, thorough and informed analysis of the war strategy of Russia, Germany, Britain and the United States. It plays no favorites, shows no reverence for the great names of Churchill and Roosevelt, and often lightens a serious historical record with surprising humor.

Trumbull Higgins

\$6.00

# **THE GREAT DETERRENT**

Taking as his starting point the German plan for a European war made by von Schlieffen and von Moltke in 1914, the author analyzes and discusses the strategical problems which followed the development of mechanized warfare and the growth of air power. He then provides what he describes as "a launching site for future strategic thinking," a step needed in view of possible nuclear war.

Sir John Slessor

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by Ken Hechler

Here is the complete, authoritative account of what happened at Remagen on March 7, 1945, when a handful of American soldiers took the bridge by crossing it while the Germans were still trying to blow it up. The author was a combat historian at that time, and arrived at the bridge in time to interview both Germans and Americans who had taken part in the action. General Matthew B. Ridgway says of this book: "In war, time and timing are of vital importance. Nowhere is this better illustrated than in the epic of Remagen. Ken Hechler has produced an account of deep and lasting human interest, a gripping portrayal of the reactions of seasoned leaders in decisive moments of combat. It is an absorbing story, backed by extensive research, and should prove to be a great contribution to military history."

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This volume is the second of a special two-volume narrative pictorial history of the Korean conflict. It spans the period from the dark days of January 1951, when Chinese Communist forces were threatening to drive General MacArthur's troops out of Korea, to the signing of the Armistice on July 27, 1953. Like its predecessor, *Korea 1950* (available at \$1.25), it attempts to provide an accurate outline of events in order to show the U. S. Army veteran of the Korean conflict how the part he played was related to the larger plans and operations of the United Nations forces. Like the earlier Korean volume, this history focuses primarily on the U. S. Army story, but it also covers the roles played by the U. S. Air Force, the Navy and the Marine Corps and includes the contributions of the many nations that participated in the successful resistance against armed aggression. *Korea 1951-1953* is an authentic and striking portrait of combat.

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*In furtherance of its aims and purposes, the Association publishes this professional and scientific journal known as ARMOR. In the interim months between issues of the journal it publishes a NEWSLETTER for domestic addressees. It also conducts a book department for the sale of books.*

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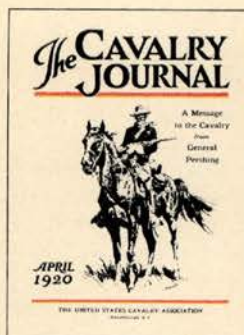
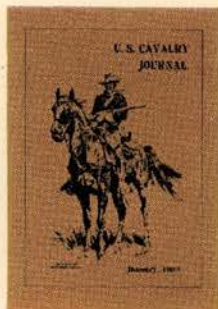
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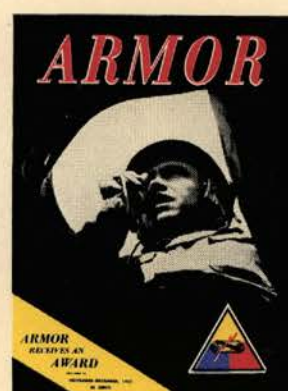
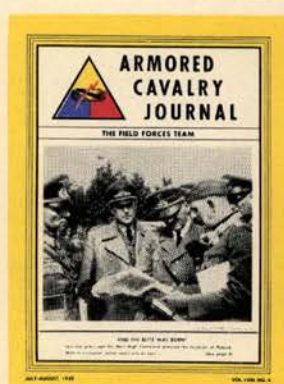
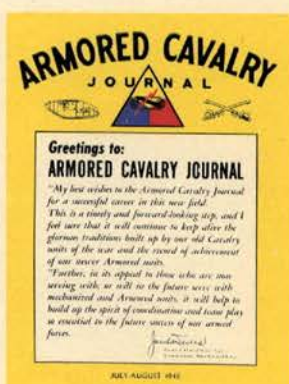
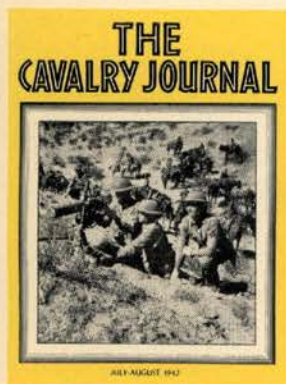


# ARMOR



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## MILESTONE IN MILITARY PUBLICATION

Seventy years ago the Magazine of Mobile Warfare embarked on its mission of service to the Mounted Arm and the Army  
[See page 4]

MARCH-APRIL, 1958 • 85 CENTS





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# WAR-1974

By **LIEUTENANT COLONEL ROBERT B. RIGG, USA**

This is a dramatic, action-packed account of a future global war. Now you will realize why our top leaders have been so alarmed!

This is fiction, it is imaginative, but it is by no means fantasy. The story is based on known facts, on weapons now being used by our armed forces, plus machines of warfare on the drawing boards or undergoing tests. The author, on active duty in the Pentagon, has spent years studying new developments at close range and his gripping account of WAR-1974 shows how these incredible devices will be used. This story will command your interest from the very beginning because events described strike close to home.

The first thermonuclear missiles fired in hate leave the snowy, frozen earth of Siberia on New Year's Eve 1974. Chicago becomes a ghastly thermonuclear crater, the New York holiday crowd becomes a milling mob so panicked that the streets and subway entrances are full of trampled dead. Two smoking radioactive craters scar the earth several hundred miles from Detroit and Pittsburgh. American satellites signal from their celestial orbits that more ICBM's are on the way.

By dawn the population centers of America are ghost cities. America is now essentially a nation of people living in automobiles as the population spreads out over the super-highway networks to the motel complexes and small towns that have been predestinated to serve evacuees in the event of war. Back in 1962, Congress had decided that the Nation would not go totally underground in the event of attack. So, instead of voting money for huge shelters, it granted billions for a vast web of freeways and highways that would permit ultra-rapid evacuation of cities.

On the morning of 1 January 1974, it was the small-town newspapers and radio and TV stations that carried the war news to a tense American public, most of which was still traveling.

WAR-1974 is a studied military prediction of some of the things to come. This stimulating book is packed with dynamic concepts which are supported by modern facts on the missiles, machines, and precepts of today which portend an era of fantastic flying vehicles and 3-dimensional tactics in the future. While the reader may at first challenge portions of this vision of future conflict—he cannot refute the stimulus of the text, its wealth of concepts and its authoritative background of logic. In fact, WAR-1974 was primarily designed by Colonel Rigg to stimulate military thinking, and it is a powerful shot in the arm to note the degree to which American military men are now probing beyond tomorrow to prevent war as well as to enable this Nation to win it should conflict not be deterred.

This is a brilliant, thought-provoking text, packed with episodes ranging from hidden struggles below the earth in secret missile bases to electronic combat and undersea warfare with strange drone craft. Atomic powered aircraft, aerial jeeps, flying platforms, space satellites, Sky Cavalry's drone spies, battlefield television, logistical computers, delta winged planes, earth skimming tanks, atomic missiles, nuclear powered helicopters, men in strange garb with infrared-night-vision helmets—all of these are powerfully thrust in brilliant, fast moving kaleidoscope action across a brutal panorama of future battlegrounds. Fantastic as these machines and strangely garbed men may seem at first, the author explains how present day military research and development progress and programs indicate these strange and unusual things to come. The book is packed with vision that is backed by fact. While it is undoubtedly destined to create argument, it is also certain to provoke a high degree of civilian as well as military interest. Recognizing both the value and limitations of vision, Colonel Rigg vividly describes the awesome scenes, electric pace, and dimensions of warfare strange to the minds of many. This is a gripping story you won't want to miss.

◆◆◆◆

This book will be reviewed in the May-June issue by

**Brigadier General Carl I. Hutton**





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Continuation of THE CAVALRY JOURNAL

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Volume LXVII

MARCH-APRIL, 1958

No. 2

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ARMOR magazine is published under the auspices of the United States Armor Association, and is not an official publication. Contributions appearing herein do not necessarily reflect official thought or indorsement. Articles appearing in this publication represent the personal views of the author and are published to stimulate interest in, provoke thought on, and provide an open forum for decorous discussion of military affairs.



# LETTERS TO THE EDITOR

## In Support of Reserve Components

Dear Sir:

Enclosed is a check in the amount of \$123.50 to cover the cost of membership to *Armor Magazine* for three Officers and 23 Enlisted Men, of this Company, for one year. Request if accepted that membership cards be issued to those personnel listed on the attached roster.

As a direct result of prior subscriptions to *Armor* this Company was fortunate to meet Dr. Robert B. Baker of the Armor Human Research Unit CON-ARC, Fort Knox, Kentucky. Under his direct supervision we established and programmed a 'Tank Commanders' School, the results of which will not be fully known until this unit, or rather the TCs of this unit, undergo field testing by Dr. Baker in June 1958 at Fort Knox. But one result of this program can already be noted, i.e., the change from apathy in a Reserve Unit to real interest in an Armored Unit.

Here was a Tank Company that has been in existence since 1948 and has trained without a single tracked or wheeled vehicle, turret trainer, radio, etc., of its own (except at Annual Unit Training). Most of the losses of experienced veteran personnel over the past years were a direct result of the complete loss of interest in so-called skull-practice or blackboard type training year in and year out. It had appeared as though all other echelons of the service tolerated rather than supported the Reserve program and its members. Passiveness naturally had to follow.

Articles that appeared last year in *Armor*, the present promises of the possibility of receiving some equipment to train with, and the intense personal interest of Dr. Robert Baker, Dr. MacCauslan, Colonel Crocker, and others, are fanning new sparks into a heretofore dying flame. *Esprit de corps* is rising; attendance is way up; voluntary attendance at non-scheduled and non-paid drills to accomplish additional training has definitely increased; no loss of experienced personnel has been effected since the beginning of Dr. Baker's program in July 1957; and lastly a noticeable hunger of the Company personnel for *Armor* news and information, hence the enclosed membership.

We are extending the gratitude of the Officers and Men of Company B, for the opportunity to be members of the U. S. Armor Association.

CAPTAIN ISADORE E. STEIN  
Company B, 813th Tank Battalion  
79th Infantry Division (USAR)  
5200 Wissahickon Avenue  
Philadelphia 44, Pennsylvania

## The GOER Concept

Dear Sir:

This year, for the first time, a brief

survey of the problems of atomic tactics has been inserted into our course in the History of Military Art. One fact that has been carefully impressed upon us is the need for extreme mobility in our future army. Relative to this, however, one cannot help but feel that the need for additional logistical support has increased far more than proportionately. In remembering Lieutenant Colonel McKee's article on the GOER concept, I am unable to see any good reason why this idea should not be the solution to our logistics problem. Another article to describe more of its tactical capabilities and to emphasize its simplicity would answer many of our questions. But more important than this, it may well provide the additional spark that is necessary to stimulate Army-wide thought on such a very promising and revolutionary idea.

JOHN G. SCHROEDER  
Co. M-2, U.S.C.C.  
West Point, N. Y.

## Jane's Fighting Armor

Dear Sir:

I just completed a second and careful reading of the GOERS piece in the Nov-Dec issue and find it sensational. The idea of making use of a civilian development is not only good but should have been done more often in the past. Interested civilians can at times produce things of real value to the military. In various combinations they could well be the saviors of not only the U. S. Army but also of the armies of our allies. Since they are simple machines, the Turks for example could increase the effectiveness of their foot bound army 500% by the use of GOERS not only as supply carriers but as troop transport and even heavy gun mounts. I just hope the whole idea is not filed away and forgotten. (So do we. Ed.)

I would also like to compliment you

on your fine book. I subscribe to a number of service journals and of them all *ARMOR* is the most lively. It is technical enough to satisfy the machine bug and general enough to interest an average civilian. Of course I am somewhat prejudiced in favor of *Armor* since I spent a bit of time in tanks during World War II and have studied the developments in mobile land warfare since I was a boy, 20 years ago. But as an active magazine editor myself, I feel that I can speak with enough experience to say that you do a fine job in the area in which you work.

One other thing before I quit. For years I have sought a book like *Jane's Fighting Ships* on *Armor*. In 1942 a poor example was published but it hardly served the purpose. What is really needed is a spiral bound loose leaf book containing pictures and data on all military vehicles of all the armies of the world. Has anything along this line ever been published? If not it should be and a service to print supplements should be maintained to keep up with new additions.

JOSEPH MORSCHAUER III  
22 Top of Ridge Drive  
Scarsdale, New York

• *Take note, Book Publishers. Perhaps you are missing a bet. In 1945 a book entitled "Tanks and Armored Vehicles" by Colonel Robert J. Icks was published. Colonel Icks did an excellent job. If this material was brought up to date and published in loose leaf form it would have a lasting long time value. Ed.*

## Picture Corrections

Dear Sir:

May we thank you for including the article Fuel Injection Engines in the January-February 1958 issue. We believe that this is the first time so complete a story on the Ordnance Department Fuel Injection program has appeared in print.

We would like to call to your attention that the illustrations of the Conti-

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**Rates:** See bottom of contents page.



mental AV-1790-5A (page 22) and the AVI-1790-8 (page 26) Engines are shown upside down. We feel that this should be called to the attention of the members of your association.

EDWARD L. SPELLERBERG  
Manager, Technical Publications and  
Publicity  
Simmonds Accessories, Inc.  
Tarrytown, New York

• Yes our faces are red. The cuts right side up are shown on the right. ED.

#### A Handbook on German Forces

Dear Sir:

Could you or any of ARMOR's readers tell me where I can obtain color reproductions or plates of German uniforms of World War II? The "Handbook on German Military Forces" would serve my need, and I would be willing to buy, rent, borrow or trade some other book for this Technical Manual if any reader is interested. Like reader Graham, I am doing research and would be most grateful for any assistance.

ROBERT H. LARGE

1348 11th Street  
Douglas, Arizona

#### Any Back Issues of ARMOR?

Dear Sir,

This is to inform you that copies of ARMOR have begun to reach me, commencing with the January-February 1958 issue (5 February 1958). When I first wrote to you last year, it was my intention that payment arranged then should be for a complete set of the 1957 issues, and that further payment would be made at the beginning of 1958 to cover a current subscription. I would still like to have the 1957 copies, and will be pleased to arrange the necessary payment if they are available.

When I became interested in the development of armored fighting vehicles last year and began looking around for suitable material from which to compile notes, it soon became apparent that very few books on the subject had been published since the 1930's. It was not

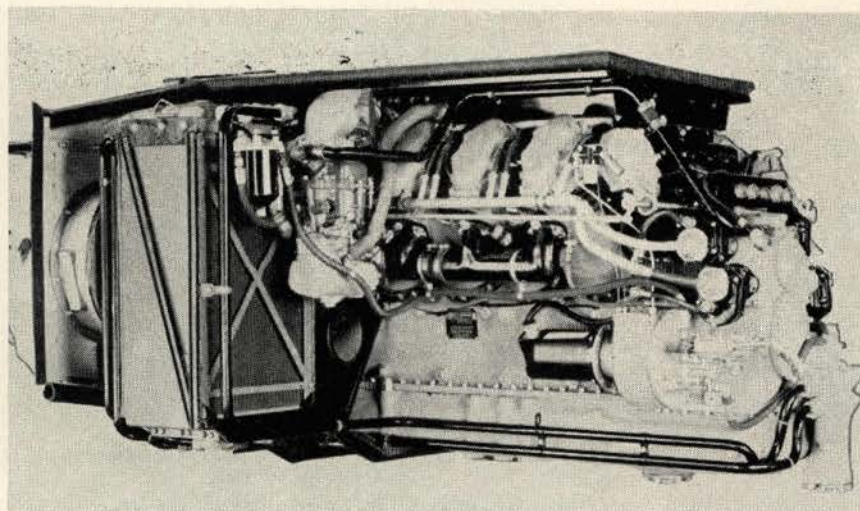
until I visited the Imperial War Museum here in London and was shown the backfiles of ARMOR and the *Armored Cavalry Journal* that I was able to make any substantial progress.

The tremendous backlog of articles with which I was faced prompted me to make immediate arrangements for a subscription. This incidentally is the reason why I should like to have the 1957 copies. Even then I am several years behind, and at the present rates of exchange I cannot afford to make up this backlog even supposing that all the journals were available. If at any time you hear of a reader who is looking for a home for back numbers I should be pleased to hear from him, also from anyone who is interested in the development of armored forces, and who would like to correspond with someone on this side of the Atlantic.

I was very pleased to make the acquaintance of ARMOR last year and am looking forward to receiving my own copies in the future. It will be quite a pleasure to read an article and be able to refer to it at leisure.

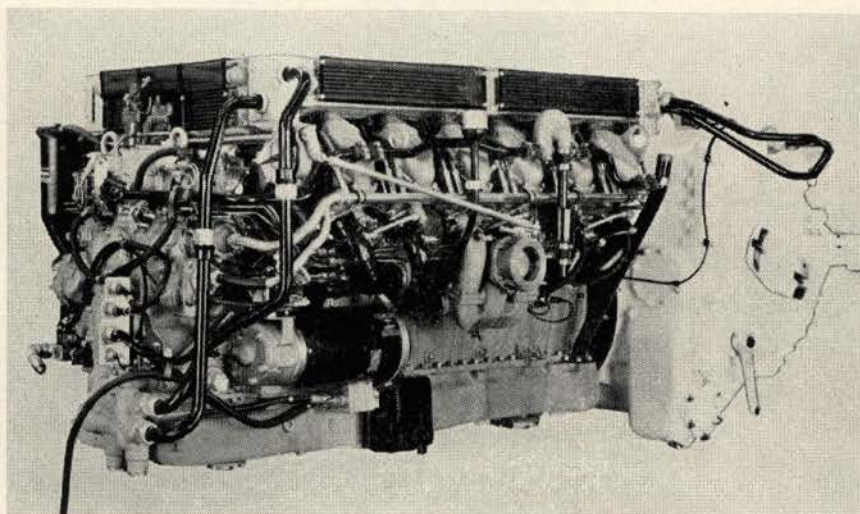
MR. G. C. WILLOUGHBY

16B Keightley Drive  
New Eltham  
London S.E.9  
England



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Continental AV-1790-5A engine.



(Simmonds Aeroaccessories Inc.)

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## ARMOR



### THE COVER

The cover was designed by Major William G. Bell, the editor of ARMOR preceding the incumbent. Spanning 70 years of military publishing, it depicts the format changes the journal has undergone down through the years from the Cavalry horse to today's modern mobile hard-hitting full-tracked armor.



*Having weathered changes from saber to revolver, horse to horsepower, and Cavalry to Armor, the United States Armor (nee Cavalry) Association and its magazine ARMOR (nee Cavalry Journal) approach three-quarters of a century of service to the mounted soldier in better shape than ever*

## SOCIETY and JOURNAL . . .

**T**HE period from 1881 up to the Spanish American War has been called the United States Army's Renaissance. In that span of years the foundations of American military professionalism were laid down. This was no precise and planned development, but a groping evolution that materialized from and overcame what has been called the Army's Dark Ages—the period from the Civil War up to 1880, when declining strength, inadequate appropriations and pay, inefficient organization, wide dispersion, a provincial existence and a hostile society, all combined to reduce the Army to such a low estate that a rising sentiment for reform and position was inevitable. It was a sign of the times when, on November 9, 1885, a group of cavalry officers at Fort Leavenworth met to form the U. S. Cavalry Association, for the "professional unity and improvement, and the advancement of the cavalry service generally."

The measure of the mounted officers' thirst for status and professional development is evident in their decision to organize an association in the face of many obstacles. Cavalrymen were scattered about the country from the Division of the Atlantic to the Division of the Pacific. In an Army numbering less than 27,000 officers and men, there were but ten regiments of cavalry, containing as potential members of the Association only 424 officers. The regiments were split into small detachments and parcelled out over a remote frontier, charged with such assorted duties as fighting Indians, controlling them on reservations, guarding and operating stage lines, safeguarding settlers, protecting railroads, restricting the depredations of desperadoes and keeping watch over labor

disputes—in sum, a police force rather than an army.

Under these circumstances an officer had little hope of finding an opportunity to acquire leadership experience through the command of sizable units in maneuvers (although cavalry officers in particular gained self-reliance in the very fractionalization of their units, which placed a full load of responsibility on officers serving in small isolated commands and far removed from their superiors). And campaigns of a size comparable to that of 1876, when Custer was overwhelmed at Little Big Horn, by 1885 were highly unlikely. For even though General Crook was actively campaigning in Arizona territory against Geronimo and his Chiricahua Apaches, and Wounded Knee was yet five years in the future, this was the twilight of Indian uprising. The officer corps had little choice but to turn to theory to promote professional qualification.

The creators of the Cavalry Association took their problems into account in organizing their society. To contend with the matter of dispersion they established not only the headquarters at Fort Leavenworth, but branches at West Point and in Indian Territory at Fort Reno. They demonstrated a fine touch for the cultivation of higher authority and an alertness to extra-military considerations by conferring honorary membership on the Commanding General of the Army, General William T. Sherman; on Lew Wallace, soldier, lawyer, governor, diplomat and author of *Ben Hur*; on Philip St. George Cooke and William S. Harney, distinguished retired general officers; and on two ex-generals of the Confederacy, Fitzhugh Lee, who became governor of Virginia as the Association was being launched, and



"Fightin' Joe" Wheeler, then a member of Congress from the State of Alabama. To these were added John Codman Ropes, distinguished military historian of the day, and Professor Jean Roemer, vice president of City College of New York and author of *Cavalry, Its History, Management and Uses in War*.

In the matter of active officership of the Association, the founders elected a Medal of Honor winner, Major Abraham K. Arnold, then of 6th Cavalry, as president, and Captain Theodore J. Wint of 4th Cavalry as secretary. The membership would turn to the general officer ranks for Arnold's successor, setting a precedent that holds to this day. But more on the presidents later.

Fort Leavenworth offered auspicious surroundings for the development of professional activity. Here in 1881 Sherman had established the School of Application for Infantry and Cavalry, a great stride forward in the building of a military educational system for the Army. It had been Sherman who sent Emory Upton to Europe

and Asia to study the workings of foreign armies, and Upton had confirmed the place of the service school in the development of a professional officer corps. With their mature professionalism, European armies were the object of careful scrutiny in America, where military professionalism was yet in the formative stages. It is not surprising, therefore, that many of the papers presented and discussed in early Cavalry Association meetings turned on the European scene.

The early months of Association activity are somewhat vague due to a paucity of records. A general lack of a sense of history on the part of successive administrations, not limited to the early years, has permitted the dissipation of much valuable archival material. The saving feature has been the society's publication, which today constitutes a priceless record.

The first issue of the *Journal of the U. S. Cavalry Association* came from the steam press of Kecheson and Reeves at Leavenworth, Kansas, in March of 1888. The

## ... of the MOUNTED ARM

By MAJOR WILLIAM GARDNER BELL

Illustrations from the author's collection

MAJOR WILLIAM GARDNER BELL, *Armor*, a 1941 inductee, received his basic training at the Cavalry Replacement Training Center, and his advanced training as horse trooper and NCO with the 4th Cavalry Regiment. Commissioned through OCS from a mechanized course at the Cavalry School in 1943, he served as horse and mechanized platoon leader and squadron staff officer in the 28th Cavalry Regiment, from Mexican border service to North Africa and inactivation of the unit. Detailed in Infantry, he entered combat in the Italian campaign, serving successively as platoon leader, company commander and battalion staff officer in the 350th Infantry Regiment. He moved up to the regimental staff for the Morgan Line occupation duties, a story set out in his book, "350th Infantry in Occupation." Assigned in 1948 as Associate Editor of the *Armored Cavalry Journal*, Major Bell moved into the chair as Editor of the mounted arm magazine effective with its name change to *ARMOR* in 1950, and his cover-to-cover restyling brought national awards in the Magazine Shows of 1951 and 1952. Concurrently Secretary of the Armor Association, he sponsored such innovations as the large annual meeting, expansion of the Executive Council, broadening of membership provisions, overseas advisory boards, Association chapters, and annual awards to outstanding ROTC students. Major Bell served a tour in the Staff Secretariat at Allied Forces Southern Europe Headquarters prior to his present assignment in the Office of the Chief of Military History, where he is engaged in work on a World War II volume. A contributor to the *Encyclopedia Americana*, his writings and photography have been widely published, in national publications, military journals, and magazines devoted to his lifelong interest—Western Americana.





# The Presidents

All Photos U. S. Army



**Major**  
**Abraham K. Arnold**  
1885-1887



**Brig. Gen.**  
**Wesley Merritt**  
1887-1908



**Brig. Gen.**  
**William H. Carter**  
1908-14, 1917-21



**Brig. Gen.**  
**James Parker**  
1915-1917



**Maj. Gen.**  
**John K. Herr**  
1939-1945



**Maj. Gen.**  
**Isaac D. White**  
1946-1947



**Maj. Gen.**  
**Ernest N. Harmon**  
1947



**Maj. Gen.**  
**Hobart R. Gay**  
1947-1949

preoccupation of the American military with European armies is evident in two articles: "Some German Ideas on Cavalry Gathered from 'Conversations on Cavalry'—Prince Kraft de Hohenlohe-Ingelfingen," and "The French Cavalry; Its Organization, Armament, Remount Service, Schools, Instruction, Drill and Tactics." A great debate of the period—whether the mounted soldier should be armed with saber or revolver, or both—runs through several articles. Other items discuss remounts, a new type field artillery piece and devices to assist the cavalryman in firing the pistol and carbine efficiently from the back of a horse.

Equally interesting with article content is a list of Association members appearing at the back of Volume I, Number 1. There is Captain Myles Moylan, who commanded A of the 7th Cavalry with the Reno battalion at Little Big Horn. Captain H. W. Lawton, who rendered conspicuous service in bringing Geronimo to heel, and who will die a lieutenant general while serving against Filipino insurgents, is a member. Soldier-author Charles King, progenitor of the Ernest Haycox school of literature, is there. There are Lieutenants W. C. Brown and J. V. S. Paddock, whose names are inscribed respectively in the history of the Sheepeater war in Idaho and the Milk River engagement in Colorado, in 1879. Rufus Fairchild Zogbaum appears—artist and author, faithful delineator of military and naval subjects. And then there is Major, Brevet Colonel, Guy V. Henry, holder of the Medal of Honor for action at Cold Harbor in '64, and severely wounded at the Battle of the Rosebud with Crook in '76: Guy V. Henry, who will retire a major general, and whose son, the distinguished Major General Guy V. Henry, Retired, is today honorary president of the society of the mounted arm.

Publication of that first list in March 1888 apparently gave the organization a shot in the arm, for the membership jumped from 182 to 310 by June and was push-

ing 400 in November on the third anniversary of the Association. Joining up were Frederick W. Benteen, Winfield S. Edgerly and E. S. Godfrey, all of the Benteen battalion at Little Big Horn; Samuel B. M. Young, Adna R. Chaffee, J. Franklin Bell and John J. Pershing, all destined to be Chiefs of Staff of the United States Army; James Parker, another Medal of Honor recipient and a future Association president (1915-1917); and Camillo C. Carr, Jacob A. Augur and Ezra B. Fuller, future editors of the *Cavalry Journal*.

In three score and ten years of publication, 26 officers have held the editorial chair of the magazine of mobile warfare, as it is sometimes called today. Fifteen have been West Pointers, and eight went on to become general officers—Carr, William H. Carter, Charles D. Rhodes, Robert C. Richardson, Jr., Karl S. Bradford, Oliver L. Haines, Charles S. Kilburn and Fenton S. Jacobs. Of these, Carter, who won the Medal of Honor in Arizona in 1881, holds the distinction of having served the Association in both editorial and executive capacities: he was editor as a captain in the period 1892-1897, and president as a general, from 1908 to 1914 and again from 1917 to 1921.

Six of the 17 presidents to date of the mounted society were Chiefs of Cavalry, encompassing the full period of existence of that office from 1920 to 1942—Major Generals Willard Holbrook, Malin Craig, Herbert Crosby, Guy Henry, Leon Kromer and John Herr. One of these, Malin Craig, was Army Chief of Staff from 1935 to 1939, bridging the tours of Generals MacArthur and Marshall. The trend in presidential rank has been upward through the years, from Major Arnold to the present incumbent, four-star General Willard G. Wyman, who heads our Continental Army Command. All of the top officers of the Association, those already mentioned and these others—I. D. White, Ernest N. Harmon, Hobart R. Gay, Willis D. Crittenger, John H. Collier





Maj. Gen.  
Willard A. Holbrook  
1921-1924



Maj. Gen.  
Malin Craig  
1925-1926



Maj. Gen.  
Herbert B. Crosby  
1927-1930



Maj. Gen.  
Guy V. Henry  
1930-1934



Maj. Gen.  
Leon B. Kromer  
1935-1938



Lt. Gen.  
W. D. Crittenger  
1950-1953



Lt. Gen.  
John H. Collier  
1954



General  
Williston B. Palmer  
1955-1957



General  
Willard G. Wyman  
1957-

and Williston B. Palmer—have made significant contributions to the professional society. But it is the second president, Brigadier General Wesley Merritt, who deserves a large share of credit for the success, indeed perpetuation, of the Cavalry Association.

A West Pointer, Class of 1860, Merritt graduated into the Civil War, rising to become a general before the age of 30. Assuming the presidency of the Association in 1887, Merritt was retained by the membership for a 20 year tenure, until his death in January 1908. His great contribution was to give prestige to the organization in the critical years of consolidation. He was largely instrumental in boosting the society over the hurdle caused by the Spanish American War, when all officers except the vice president were at the front, resulting in a single issue of the *Journal* in 1898, four difficult numbers in 1899, and a complete suspension of operations in 1900 and 1901. In an inspirational letter to the membership, Merritt in April 1902 threw his weight behind continuation of the organization and its magazine. "I have been told," he wrote, "by more than one officer whose advancement in the cavalry service has been marked, that much of the success was due to the influence of the studies induced by the Cavalry Association."

The studies to which Merritt referred, those papers presented before various groups of members and as articles in the *Journal*, ranged over a field of subjects of logical interest to the military man, and particularly the mounted soldier: tactics, techniques, training, weapons, doctrine, equipment, organization, horsemanship and horsemastership, education, personalities and history, to mention some major areas. Discussions were lively and detailed. In the *Journal* for July 1903, for example, 30 officers discoursed on the Johnson bridle bit. To stimulate such professional interest the Association in 1897 had launched an essay contest. Back of a requirement

that essays be based on an assigned subject lay a plan to publish a history of the American Cavalry. Although this never materialized, the professional activity engendered by the annual contest inspired the preparation of much good material for the magazine. In the 1903 contest, for instance, a board composed of Generals J. H. Wilson and Fitzhugh Lee and Colonel Arthur L. Wagner (the latter the noted educator at the Leavenworth school), judging material on the basis of historical accuracy, professional excellence and literary merit, awarded top honors to Captain James G. Harbord for his treatise on "The History of the Cavalry of Northern Virginia (Confederate) During the Civil War." As Harbord's advancement in the service would be marked (he was to rise to Deputy Chief of Staff of the Army), his serves as a case in point in confirmation of General Merritt's remark on the value of Association studies with relation to professional advancement.

With the close of the Spanish American War the United States Army embarked on what has been called the second phase of its Renaissance. In its sphere, the Cavalry Association moved forward. Its gathering professional strength is evidenced in many ways in this period, and not least by the October 1902 membership list, which carries the names of Generals Arthur MacArthur, Leonard Wood and Tasker Bliss. It was at this time, too, that the *Journal* got a face-lifting from an unexpected source.

Frederic Remington, whose pen and brush contributed so materially to the enduring historical record of our Western frontier, was a life member of the Cavalry Association. In 1898 Remington visited the camp of the 3d Cavalry at Tampa, Florida, where the regiment was staging for the Santiago campaign. The artist, on his way to cover the war in Cuba for *Harper's Weekly*, was a close friend of Captain Francis H. Hardie, who commanded Troop G of the 3d. During the visit Remington's



# The Editors

Twenty-six officers have held the editorship of the mounted arm's magazine over its seventy years of life. Fifteen were West Pointers, and eight became general officers. The editors have been concurrently the parent organization's single full-time active official—secretary-treasurer—and in the triple capacity inescapably have left their imprints on the professional society's history. Several were men of some intellectual attainment and produced books during their careers. Notable among these is Matthew Forney Steele, whose *American Campaigns*, outgrowth of his service as educator at the Leavenworth School of the Line, ranks as a military

*continued on opposite page*



1st Lt.  
Otto L. Hein  
1888-1890



Captain  
C. C. C. Carr  
1890-1892



Captain  
William H. Carter  
1892-1897



1st Lt.  
Thomas H. Slavens  
1897-1898



Major  
Jacob A. Augur  
1898-1899



1st Lt.  
Charles D. Rhodes  
1899



Captain  
Lewis C. Scherer  
1902-1904



Captain  
Matthew F. Steele  
1904-1905

attention was drawn to one of G's noncommissioned officers, Sergeant John Lannen. A superb rider and an imposing figure, the soldier impressed Remington as the perfect example of a cavalryman. He made several rough sketches of Lannen.

From these roughs Remington later made two finished sketches, which he presented to the Cavalry Association in 1902, as the *Cavalry Journal* was resuming publication. His excellent drawing of a frontier cavalryman appeared on the front cover of the *Journal* in January 1903. It was to hold this position for almost 40 years, until July 1942, and through the years would acquire the label "Old Bill." The second sketch, of a cavalryman riding away from the viewer at a gallop, appeared on the back cover and as a tailpiece inside the magazine for many years. But it was the front cover sketch that had feel, character, authenticity. Always a branch of great *esprit* and highly conscious of history and tradition, the Cavalry took the Remington masterpiece to its heart. It appears to this day on the masthead page of the professional magazine of the mounted arm, a trademark of mobility in war.

As the impact of the Army's renaissance and the Cavalry Association's example became increasingly felt, other branch associations and magazines began to appear on the military scene. Many officers of Infantry, Artillery and other services had joined the Cavalry Association, drawn by a community of professional interest. Inevitably a desire for greater concentration on branch affairs intruded, and the various specialists took steps to form their own organizations. The year 1892 saw the creation of the Coast Artillery Association and magazine. Infantrymen launched an organization in 1893 and a journal in 1904. Field Artillerymen put their society under way in 1910, and between 1920 and 1946 the services lined up—Engineers, Ordnance, Quartermaster, Transportation, Signal and Chemical. These organizations and their "trade journals of war" over the years have rendered a clear service to the Army and the nation.

With the 20th Century came mechanization. Its application to military purposes had broad implications, especially for the Cavalry arm. As the tank moved onto the battlefields of World War I its element of protection was in the ascendant, for it was designed to break the trench stalemate by overcoming the machine gun and barbed wire. Yet it was an augury for the future when General Pershing placed the Tank Corps under the command of a cavalryman, Brigadier General Samuel D. Rockenbach, longtime member of the Cavalry Association and a contributor to the *Journal's* pages as far back as 1894. One of his younger officers was Captain George S. Patton, Jr., who a quarter-century later in another global conflict would do so much with this machine which he helped introduce to the battlefield. Incidentally, the careful researcher in the *Cavalry Journal* may trace the career of Association member Patton through articles under his byline ranging from lieutenant to general and spanning three decades.

World War I brought another crisis in Cavalry Association affairs. The secretary-treasurer-editor, retired Lieutenant Colonel Fuller, in poor health but carrying on, was awaiting replacement. But as Fuller noted in the July 1917 issue of the *Journal*, "everybody who can



wants to go to war, and those who can't don't want the job." He suggested that it might be better to suspend operations as had been the case at the turn of the century. But he got out three more issues, and with the April 1918 number the *Cavalry Journal* went into suspense for two years, with 1919 a complete blank.

As it had on the occasion of the other interruption, the *Journal* came out of this one with a new face. Old Bill still graced the cover, but page size was expanded and layout revamped. Major Robert C. Richardson, Jr. moved into the chair in replacement of Fuller. And now the Association's base of operations was moved to Washington, D. C. The organization had need to be on the scene in the Nation's Capital, for its future, inextricably interwoven with the future of the Cavalry, was by no means definitely assured. As Major LeRoy Eltinge put it in the April 1920 revival issue, "the Cavalry of the Army emerged from the World War in poorer condition than any arm of the service." Indeed, there was much to be done.

That issue opened fittingly enough with an inspirational message to the Cavalry from General John J. Pershing, designed to carry the arm through critical times. The theme running through the number was hopeful: "the future of cavalry lies in its mobility."

It was in this period that the Army, recognizing the real contribution of the unofficial professional associations and journals to the profession of arms, authorized the assignment of active duty personnel to the editorial-secretarial posts; the task up to this time had been carried out in their spare time by a small number of highly dedicated officers. Under the new arrangement the organizations rightfully retained their freedom of operation, although in the '30s they lost the revenue of advertisers when Congress wrote into the appropriations bill a rider prohibiting publications run by active duty staffs from taking paid advertising—a far cry from those years in the '80s and '90s when the *Journal* carried a lively advertisers' section; when the ads were oozing with testimonials and even the Post Chaplain at Fort Leavenworth was delighted to give his endorsement to Woodley's *Sans Pareil*, the Great Army Remedy for the Preservation of the Hair!

At the close of World War I the thinking with respect to employment of the tank was still far from clear. There was indecision as to which of the ground arms should have cognizance over development. The Tank Corps was dissolved and tank development placed under the Chief of Infantry. The general theory of mechanization, however, was assigned to the Cavalry. Few professionals yet saw the possibilities inherent in armor—that Cavalry might logically inherit armor, and that armor possessed the classic cavalry characteristics of mobility, firepower and shock action, and therefore the capability of carrying on the cavalry role. Daniel Van Voorhis, Adna R. Chaffee, Jr., and a few more spoke out. But the horse had an attraction to the heart as well as the head of the cavalrman, and even at the time in the '30s when the 7th Cavalry Brigade (Mechanized) was formed, it was generally considered to be a professional hazard for an officer to identify himself with the new medium. Few cavalymen were prepared to trade the horse for the tank and perhaps compromise their careers. Among those

classic. William H. Carter authored several texts on cavalry subjects, recognized beyond the borders of this country. The versatility of many of the editors may be readily uncovered from the pages of the magazine through the years; there are articles, book reviews, editorials, even translations of foreign publications, all giving evidence of their accomplishments in the field of military scholarship.

In addition to their editorial qualifications, these officers necessarily had to demonstrate their talents as businessmen, for the Association, although subject to its ups and downs through the years, yet has represented a sizable business requiring efficient administrators to keep it on the road. Yes, these officers who have been charged with the stewardship of the society and journal of the mounted arm have made significant contributions to their organization, their branch, their Army. The anniversary is an appropriate moment to call the roll.



Captain  
Herbert A. White  
1905-1907



Lt. Col.  
Ezra B. Fuller, Jr.  
1907-1918



Major  
Robert C. Richardson  
1920-1921



Major  
Jerome W. Howe  
1921-1924



Captain  
George A. Moore  
1924



Lt. Col.  
W. V. Morris  
1924-1927



Major  
Karl S. Bradford  
1927-1928



Major  
K. G. Eastham  
1928





Major  
Oliver L. Haines  
1928-1931



Lt. Col.  
George M. Russell  
1931-1935



Captain  
Charles S. Miller  
1935-1937

Author's Note: It is extremely difficult to round up pictures of so itinerant a group as army officers, especially over the spread of years involved here. The record turns out to be gratifyingly complete, even while some of the photos are not contemporary to the individual's editorial stint and accompanying rank as indicated in the captions. Credit is due as follows: Hein, Slavens, Augur, Rhodes, Scherer, Steele, White and Fuller from USMA Archives; Carr, Morris, Bradford, Haines, Russell, Miller and Jacobs copied by the author from Cavalry Journal; Carter, Richardson, Kilburn, Yale, Burch and Zierdt from U. S. Army; Sumner by Hessler; Bell a self-portrait.



Major  
Charles S. Kilburn  
1937-1940



Major  
Fenton S. Jacobs  
1940-1942



Colonel  
Edwin M. Sumner  
1942-1948



Colonel  
Wesley W. Yale  
1948



Colonel  
Claude O. Burch  
1948-1950



Major  
William Gardner Bell  
1950-1953



Lt. Col.  
William H. Zierdt, Jr.  
1953-

who stepped to the new field, however, were two future presidents of the mounted society, I. D. White and Willis D. Crittenberger.

Through these years of growing pains the Cavalry Association gave some attention to mechanization through the pages of the *Journal*, but more to horses. Gradually the article had taken the place of the paper of earlier times. The Association became essentially its magazine, and there through the '30s many of the big names of World War II put in an appearance, and not all were cavalrymen: Jonathan M. Wainwright, Lucien K. Truscott, Joseph W. Stilwell, Maurice Rose, Robert W. Grow; and in 1931, Major Dwight D. Eisenhower, authoring an article on "War Policies."

As war flared once again in Europe, the crisis developing in the Army over the Cavalry role deepened. Events came to a head with a rush. In 1940 the Army bypassed the traditional ground arms by organizing an Armored Force, while at the same time in the Cavalry famous horse regiments were partially and then completely mechanized. In 1942 the offices of the Chiefs of the Combat Arms (Cavalry, Infantry, Artillery) were abolished. As a crowning blow to the Cavalry, the famous First Cavalry Division was dismounted and sent to the Southwest Pacific as a foot unit.

A hint of the struggle attendant upon these events is apparent in the words of Major General John K. Herr, last Chief of Cavalry (1938-1942), and president of the Cavalry Association from 1939 to 1945. The quotation is from his book, *The Story of the U. S. Cavalry* (Little Brown & Co., Boston, 1953), written with Edward S. Wallace and published not long before his death:

What caused this sudden and extreme action? It was probably a combination of factors. The great successes of the German panzers (which nobody denied) over the good roads in the flat country of northern Europe had their effect on the extremely motor-conscious American public and its tendency to rush *en masse* to extremes. The horse was dead! Long live the motor! Thus reasoned many people who had never tried to cut cross country, between the hard roads, in their shiny, chromium-plated, streamlined pride of the Detroit production line and knew nothing about the use of horses. That there was influence brought to bear by certain industries which would profit heavily by the production of the enormously expensive tank and other mechanized vehicles is almost certain. Then, there was the ever-eternal green-eyed monster of jealousy which had been aroused in the breasts of the other services, especially among soft and inactive officers behind desks, over the color and glamour attached to the cavalry, over the good times which officers of that branch enjoyed in their sports at all the cavalry posts, and over the certain indefinable social prestige which the man on horseback, the cavalier, the *hidalgo*, the gentleman, has always had over the man on foot. All these influences combined, and amidst the excitement at the outbreak of war, managed to eliminate what they called an archaic branch.

Whatever the reasons, the horse departed the Army, and the mounted arm was beset by internal divisions that



threatened its professional base. The Cavalry Association suffered as well, and partly by its own hand.

With the U. S. Army at its wartime peak in strength, the *Infantry Journal* soared to well over 100,000 subscriptions exclusive of the Overseas Edition. Not so the *Cavalry Journal*. Against a potential represented by 16 armored divisions full of cavalymen, a cavalry division, many armored cavalry groups and squadrons, and many separate tank and tank destroyer units, the *Cavalry Journal* reached a subscription peak of little more than 7,000. This can be attributed to a failure to break with the past and step out resolutely to embrace the new medium—armor—which had absorbed the great percentage of branch members. As German panzer forces lashed out across European battlefields, Russian horse cavalry galloped across *Cavalry Journal* pages. Armor and mechanization got some space, but a provisional platoon of horse-mounted soldiers in the Italian campaign was likely to receive equal attention with the exploits of an American armored division. And there was continuing attention to foreign horse cavalry, horse breeding and equestrian sports. The Association lost many sincere professionals from its membership rolls.

In World War II the Cavalry Association and *Cavalry Journal* met a war which did not put operations at least temporarily on ice. But in clinging to the past the Association came close to sealing its own doom. The low point was late 1947, when subscriptions dropped to around 1,800. One step of importance had recently been taken which might redeem a bad situation. In mid-1946 a small group of professionals had rallied round and put the organization in tune with realities. The name was changed to U. S. Armored Cavalry Association. The magazine became *Armored Cavalry Journal*. Content increasingly reflected the new order.

In all fairness it must be noted that all service journals suffered a share of the difficulties growing out of the postwar ebb. The league-leading *Infantry Journal*, feeling the subscription pinch, in the late '40s put forward a merger proposal which in essence suggested the liquidation of the Associations and journals of Cavalry, Field Artillery and Coast (Antiaircraft) Artillery, with all assets to be turned over to a new organization and magazine of Army-wide implication and title, based on the Infantry Association's existing plant and staff, with some minor representation of the other three organizations. By 1953 the two Artillery organizations had joined this Association of the U. S. Army in the *Combat Forces Journal* (today *Army*). The members of the Armored Cavalry Association voted down the proposition, seeing it as a sub-merger, and desiring to retain a strong voice in behalf of their troubled branch. The Association position was admirably represented by Lieutenant General Geoffrey Keyes in high-level meetings with advocates of a merger of the several combat arms magazines and societies. From initial negotiations in 1948 through *ARMOR*'s Nov.-Dec. 1952 editorial and later reaffirmation by Executive Council resolution, the mounted organization has consistently supported the concept of an Army-wide Association, while maintaining a firm stand in behalf of branch societies and journals. A sentiment for perpetuation, it may be noted parenthetically, was not unusual for an organization with a lineage such as that of the

mounted society. Many military families may be traced through the history of the mounted organization and the pages of its publication, from distinguished father to distinguished son. The Cavalry family tree is liberally sprinkled with the accomplishments of several generations of Henrys and Howzes, Holbrooks, Reads and Pattons, to note a few examples.

Mid-century will go down in the history of the society of the mounted arm and its publication as a moment of resurrection. For it was then that Congress passed the Army Organization Act of 1950. The legislation made of record an evolution which had been in process for several decades. The passage that cleared the air read: *The Armor shall be a continuation of the Cavalry*.

The steps remaining to be taken were obvious, and the Association's Executive Council moved immediately to implement them. On the heels of the legislative action the Armored Cavalry Association became the U. S. Armor Association. The magazine became simply *ARMOR*. The July-August 1950 issue came out re-designed from cover to cover, setting a style which won for the publication national certificates of award in the Magazine Shows of 1951 and 1952, sponsored by the American Institute of Graphic Arts. New features and top authorships and material greatly enhanced the magazine's reputation.

A year and a half later the society, breaking the precedent of 25-member annual meetings in one room of Washington's Army and Navy Club, moved to Fort Knox, the Home of Armor, for its annual reunion. As many officers attended the business session in Theater No. 1 as had been on duty in the ten regiments of cavalry existing in the Army when the society was launched at Fort Leavenworth 66 years before.

The subscription rolls of *ARMOR*, continuation of the *Cavalry Journal*, today almost match those of the magazine at the height of World War II, and since 1957 member and unit subscribers have been getting a Newsletter in the off months between magazines into the bargain. The Armor Association, continuation of the Cavalry Association, is today a strong and vital professional organization, devoted to the affairs of a strong and vital combat arm of the Army.

Perhaps the outcome for a society beset by many difficulties was foreordained. For after all, these were events affecting the mounted soldier, the *arme blanche*, CAV-ALRYMEN! The sense of all this has perhaps never been put more effectively than by a non-cavalryman. Writing from Tokyo a decade ago in observance of the *Cavalry Journal*'s sixtieth anniversary of service devoted to "keeping the military profession abreast of the cavalry arm in the art of war," General of the Army Douglas MacArthur said: "During these decades no other branch has experienced greater change in weapons, in technique, and in tactical requirement. Discarding the horse and the saber to keep pace with the increasing tempo and violence of modern war, the cavalryman speedily adjusted himself to armored mechanization and commensurate firepower, firmly to hold his historic role of the far-flung and rapid movement echelon. In this he demonstrated with striking clarity that the invincible *esprit* which has characterized his past yet carries him to the vanguard of every advance, an irresistible force toward victory."



*The ensuing article by our Association President and the Commanding General of CONARC is an unclassified version of a classified speech delivered to the Air War College. We choose to title it*

# HIGHLIGHTS of Army Doctrine

By GENERAL WILLARD G. WYMAN

**P**HILOLOGISTS agree that all that has been written about all of the subjects of human thought since the dawn of history would not suffice to completely explain what is meant by a single word. So do not expect a complete explanation of Army doctrine in the next 50 minutes! At best I can only "X in" the major bench marks, indicate some of the more significant contour lines, and trust that you already know by heart "the uses of a hill."

In a recent article on our national strategy and military doctrine, Dr. Raymond L. Garthoff used the following thumbnail definition to establish his initial frame of reference: "Strategy relates to the attainment of objectives and doctrine relates to the employment of means."

While too narrow for the scope of our discussion, his definition illuminates a much broader frame of reference if we apply it to the statement in your study circular which sets forth the purpose of this lecture: "To provide an understanding of U. S. Army doctrine and an appreciation of its influence on U. S. military strategy."

In the light of Dr. Garthoff's definition, a fundamental principle of Army doctrine is at once apparent here. It is the principle that the determining influence between the employment of means and the attainment of objectives in war travels on a 2-way, 3-dimensional street. The universal truth that the means determines the ends as well as vice versa is the roadbed of this 2-way street. Its three dimensions are Air, Sea and Land.

Failure to appreciate the workings of this principle has sent many a nation to the morgue and the autopsy tables of history. For example, consider the prewar objectives of Nazi Germany, the means employed by Hitler to attain them and the end results. Would the end have been different had Hitler not employed genocide and wanton force as he did at Rotterdam, Coventry, Lidice and in the Ukraine? On the other hand, consider the prewar objectives of France, the imbalance of her military means, the rigidity of her doctrine for employing them, and the consequent disaster of military defeat and occupation.

May historians of the future never have reason to attribute our nation's fate to either wantonness or rigidity! May we never stake our national existence upon a "Mega-

ton" or a "Maginot Line" anywhere—on land, at sea, in the air or in the mind!

On the azimuth of this aspiration, we arrive at the first bench mark to understanding Army doctrine. Neither absolute nor rigid, Army doctrine predicates no single solution, no set pattern for national defense. It harbors no narcissistic illusion that land forces alone can enforce our national policy in the teeth of the multi-dimensional threat posed by our obvious enemy.

Army doctrine is *Tri-service!*

Our tri-service doctrine recognizes the entire spectrum of possibilities in warfare—not only as they stem from our own military capabilities and national objectives, but as they stem from the enemy's capabilities and national objectives. Red Russia now has military means of great numerical and technological strength covering the entire gamut of known military force by land, sea and air.

This full scale of military means enables Soviet planners to exercise great flexibility in their grand strategy. It provides them with a very high potential for accommodation to our own capabilities and responses. Hence the possible characteristics of an armed conflict with the Communist Bloc are manifold.

In broad outline, here are three major possibilities that condition our *tri-service* doctrine. And I take them in order of gravity—not their order of probability.

First, there is the possibility that the enemy might try for a nuclear knockout. This possibility would seem remote. Or does it? That it would be dangerous to rule out such a miscalculation is evinced by the pages of recent history.

In this event it is obvious that our national existence would depend initially upon the performance of our strategic retaliatory forces. But what then? With air bases, ports, factories and cities on both sides of the Iron Curtain pulverized, do both sides surrender to each other? Or does victory go to the side which can continue to fight most effectively with the means remaining?

Since it is axiomatic that the first objective of airpower is the destruction of the enemy's airpower, we must not be astigmatic to the possible effect of nuclear parity upon airpower itself, at the very outset of such a war. . . .



How many planes, missiles and facilities for their production would be left on both sides after the first few days of an all-out effort? . . . While this question is as impossible to answer exactly as it is dangerous to ignore, it has one facet of which we may be sure! If there is anything left, there will be *people*! And among the peoples of the world, there will be jackals—like Mussolini when France was reeling in 1940—eager for the spoils. In this situation, our national survival would obviously depend upon the loyalty of our allies and the preparedness of our Army to fight with whatever air and naval support remained.

To fulfill the demands posed by this first possibility, broad Army doctrine would require: An Army force in being with a strong training base on which to build and rebuild.

Second, there is the possibility of a general or global war in which tacit or announced limitations in weaponry and targetry are mutually observed! Such restraint in a future war is neither unprecedented nor irrational—unless we deem mankind to have been irrational ever since the day Cain spared Abel's mother. The entire history of warfare is one continuous precedent of restraint in exercising force. Without it, mankind would have been reduced to nonentity long ago. The job of mutual extermination could have been accomplished just as surely with clubs and swords, and just as quickly—just as cheaply as it could with nuclear fission and fusion. Even the Nazis chose military defeat in preference to mutual extermination and refrained from loosing the products of their bacteriological and chemical laboratories on the world.

Assuming that any restraint is observed in a global war, it appears logical that it would be a limitation in weapons employed against the civil populace. The strategic nuclear weapons on both sides might still be used against purely military targets or not at all.

This possibility in no way mitigates the grim necessity of maintaining a clear-cut superiority in our nuclear retaliatory capability before and during such hostilities. While history indicates that moral law imposes stiff penalties upon nations that violate it in war, it rarely does so in time to save the victims. So our best insurance that mutual restraints will not be broken by the enemy is the obvious ability to make the crime instantly unprofitable. By clear-cut superiority in our nuclear retaliatory capability, I mean a delivery system that cannot be thwarted plus sufficient destructive power to administer a *coup de grace*. I do not mean, however, that we must be able to destroy our enemy a hundred times or even ten. Once will do.

But even in this second possibility of so many variables in degree, a broad Army doctrine will require: An Army force in being with a strong training base on which to build.

To win another global war waged with mutual restraints in weaponry and targetry against the Communist Bloc would require the maximum effort by land, sea and air that we and our allies could produce. Which of the three services would strike the decisive blow is impossible to predict, or even to know after the fact. For example, who could say that winning the undersea struggle would be any more or any less decisive than mastering the

enemy in the stratosphere? Without control of vital sea lanes, it would be impossible to sustain our embattled allies and forces overseas. Without control in the air, it is doubtful that we could control sea approaches—let alone land areas—critical to military operations.

But of this we can be sure: The conclusive role in such a conflict would be performed by MAN on the ground with weapons in his hand. Only when he is in a position to enforce any decision at arms upon enemy peoples where they live can any conflict be victoriously concluded. That he will be opposed in great numbers by the enemy's MAN on the ground goes without saying. But numbers alone do not win wars. Otherwise the American people long ago would have been on a diet of black bread and borsch! Nevertheless, the American soldier will need better training, better tools, and stronger air and naval support than ever before to cut his goliath down to size.

The third possibility is a localized war—a conflict limited in geography, though not necessarily in weaponry. Such a war would be the product of our response to another act of limited Communist aggression like the invasion of South Korea. The localizing factor in the conflict would be the value of the limited objective at stake and the risk to both sides of triggering a thermonuclear holocaust by expanding hostilities.

Far from being remote, the possibility of another localized war could materialize with the next tick of the clock. The Soviet strategy to activate it has been in successful operation ever since Lenin adopted the strategy of limited objectives set forth in the last will and testament of Peter the Great, Tzar of Russia. And if you haven't read that document, I suggest that you do so as part of your professional education. Whether penned by Peter or by Napoleon (as some historians claim), there can be no doubt that it is an authentic work of a clever but devious mind. You'll find it quoted by Sykes in volume II of his authoritative book *A History of Persia*, printed in 1905.

IF you thought that *Mein Kampf* was an amazing blueprint for world conquest, you should see how faithfully Peter's heirs have followed his blueprint! In addition to specifying the limited objectives to be taken in sequence, Peter advised his descendants to adopt a priestly dogma, a fanatic approach, which could serve as an ideological tool for subversion. Beginning with the adoption of Communism in 1917 and continuing step by step with the annexation of the Baltic States on the north flank, the satellization of the Balkan States on the south flank, the division of Poland, Germany and China, the pincering of India, right up to more recent events in Syria, the Kremlin's fidelity to Peter's blueprint is at least a remarkable coincidence.

Far from being outdated by the atom bomb, the Communist strategy of expansion by limited objectives has proved a highly successful accommodation to our nuclear deterrent. So successful, that the cartographers have been hard put to keep up to date with it. Since 1945 we have seen the successive fall of Central Europe, China and North Indo-China, and we have been confronted with aggressive actions against Iran, Greece, Korea, Formosa, Malaya, North Africa and other areas—all under condi-



tions less than would warrant massive retaliation or general war.

Today—and I use the word literally—Red Russia is continuing to pursue its goal of world domination by a strategy of limited objectives. The value to us of each objective is carefully calculated in advance to be well below the high level of mutual risk posed by the strategic nuclear threat. With a complete scale of military capabilities, Soviet planners can employ the means most appropriate to the *objective and our opposition* in accordance with the timeless principle of war: “Economy of force.”

HAVING selected a limited objective, they cannot be deterred by threats of force which are so disproportionate in mutual risk as to be implausible on the face of it. In fact, they can flash aces of their own and “beep beep” across our horizon—not only to remind us that the risk of annihilation is mutual, but to assist them in softening up their prospective victims psychologically.

As the level of mutual risk has risen since 1950 with increasing parity and power of the strategic nuclear threat, so have the value and scope of the limited objectives that Soviet planners may deem it safe to select. In this regard, recent events in the Near East menacing the Free World’s vital oil supply speak for themselves.

To win a localized war—and here is our doctrine—we must have ready military means as flexible, as controllable and as usable as our opponents, but more efficient. We must be able to impose a price upon the enemy for limited aggression that exceeds the cost to ourselves, but does not exceed restraints appropriate to the limited objective involved. While we must be able to defeat the enemy tactically, we must be able to leave him an avenue of strategic and political withdrawal that will make it possible for him to accept a limited defeat. In this connection, it is interesting to note that the concept of the ancient Chinese strategist Sun Tzu of building a “Golden Bridge” behind the enemy cropped up in a figure of speech used by our country’s foremost member of the profession of arms at a press conference recently. His inference that it is a good idea, under certain conditions, to leave a back door open for our enemy to retreat from a strategic position is not without significance at a time when absolute concepts in war are so readily realizable.

So I repeat, broad Army doctrine for meeting the possibility of localized war requires: A strong Army force in being with the ability to move to any part of the globe in minimum time.

Failure to tailor our defense capabilities to the obvious strategy of the enemy is every bit as critical for the Navy and Air Force today as it is for the Army. Unless the Army is provided with the strategic mobility, the modern tools and the trained men to deter or defeat limited aggression, the United States in due course may find herself isolated in a fortress America with her freedom of action to defend herself dangerously restricted.

Turning now to tactical doctrine, the most important bench mark to remember is this: Our tactical concepts of future operations presume neither the use nor the non-use of tactical atomic weapons. The very existence of tactical atomic weapons in the hands of the enemy has already conditioned the battle area of the future regard-

less of *when* or *whether* the weapons are employed. In addition, the lethality of conventional weapons has so increased since World War II that the troop formations employed in Korea, for example, might well invite disaster today, even without the presence of the atomic weapon.

However, it would be naive to assume that the aggressor will always refrain from using one tactical weapon to do the work of a hundred against troops and military targets in the field of operations. Risking tactical retaliation against units in the field poses an acceptable danger quite different from that of risking a retaliatory exchange of strategic nuclear blows which could destroy mankind.

Regardless of the tactical weapons that the enemy employs, moreover, we can never afford to meet the masses of Eurasia on a man-to-man, life-for-life basis.

While we recognize that the destruction of enemy units can often be achieved by capturing, bypassing or dispersing them, we must always have sufficient tactical firepower to reduce the enemy to manageable proportions. While we should continue to strive to attain our objectives by superior mobility and schemes of maneuver, we must never forget that the enemy’s manpower exceeds ours by eight to one. A series of Pyrrhic victories which imposed a disproportionate drain upon American manpower would be just as disastrous to our country as Napoleon’s victories ultimately were to France.

One of the most immediate problems—the reduction of fallout and radiation—has already been solved by science. Tests have shown that nuclear explosives can be “sanitized” to produce negligible fallout effects. While the announcement was coldly received by laymen of the press who thought of it only in terms of strategic bombing against cities—“How dead can we get!” some of them said—its tactical importance can scarcely be overstated. Not only does this development make atomic weapons adaptive to a much wider variety of situations on the battlefield, but it renders their tactical use more likely in view of the reduced danger to the civilian populations of the areas involved.

Another, more complex, problem of the atomic battlefield which currently confronts us is that of improving our combat surveillance capability.

The elements for extending our target acquisition and combat surveillance capability must be instantly responsive to the combat commander who has the immediate responsibility of acting upon the information obtained. In the fluidity of situation which we must anticipate in atomic battle, we cannot wait until a target has completely formed to identify, locate or even detect it. We must be able to detect hostile targets deep in the enemy-dominated portion of the battle area while they are forming. We cannot wait until a tactical situation has crystallized to act upon it. We must be able to deduce from the information furnished by our combat surveillance system the nature of events before they happen!

Our ground commanders must also have a surveillance capability to cover the area between and behind their units as well as the vastly increased distance in front of their units.

To meet these requirements, a great deal of effort has been devoted to the development of electronic and other sensory devices for indicating enemy installations and



activity. While they are readily employable from and within our own area, they are somewhat limited in range by terrain, fog, snow, haze and ground clutter. As matters now stand the only way we can extend their range to the minimum depth of perception required is by using air platforms to fly the sensory devices into and over suspect areas of enemy activity.

No less important for successful adaptation to the conditions of atomic battle is our requirement for vertical mobility. Without the capability to use the third dimension tactically, it would be impossible for us to cope with a numerically superior enemy who already has this capability to a degree that is just as advanced as the capability for strategic weapon delivery he recently unveiled. Like our enemy's land forces, we must have tactical aerial vehicles that will permit us to:

1. Move patrols and assault forces up to battle group size to seize critical terrain and exploit tactical atomic blows.
2. Move reinforcing elements in depth or laterally to meet or counter an enemy threat or to create one of our own.
3. Effect rapid shifting of weapons with crews and other combat equipment within the battle area—particularly across natural or manmade obstacles.

Please note that I am talking about tactical movement within the battle area. The United States Army has no intention whatsoever of competing with our own teammates—only with the Red Army. There is no conflict of role or doctrine here—save in the minds of those who mistake the means for the mission! It is no more and no less logical that the Army have flying gun platforms and other tactical vehicles for our purposes *above the ground* than it is for the Air Force and Navy to have jeeps and trucks for their own purposes *on the ground*.

As those of you who have visited our U. S. Army Aviation Center at Fort Rucker, Alabama, well know, we have not been idle in our efforts to provide ourselves with the eyes and vertical mobility we need to stay alive on the atomic battlefield. Craft to meet our tactical requirements are being developed as fast as the stringent limitations of our budget will permit. We are moving ahead with what we have on hand and on the way, changing our tactics and organizations to fit the conditions of atomic battle as they could materialize tomorrow.

By next summer, all our divisions will be streamlined. With their new pentagonal organization, the ratio of fighter to administrative personnel is increased and the chain of command shortened. Rockets capable of atomic fires have replaced much of the conventional artillery in the fire support group of the division. Air transportability has been given the high priority that its importance to strategic mobility deserves.

Looming in the background of our transitional scene is a very real danger. To catch an enemy while he is crossing a stream is the classic equivalent of crossing the naval "T". Alert to the possibility that the enemy might come at us in midstream, we have been working for three years now with what we call a mobile forces concept which provides our tactical units with combat readiness today, even in this transitional period.

Within the framework of its organic means, each in-

fantry division has organized and trained mobile forces of combined arms teams having a much higher firepower-manpower ratio than provided by transitional tables of organization. In the 1st Infantry Division at Fort Riley, for instance, each Battle Group is prepared to field a mobile force with more firepower than an Infantry regiment of World War II days but with fewer men than an Infantry Company!

By integrating tank, artillery, automatic weapon, rifle, communication, engineer and other support elements into tight-knit mobile teams of great tactical self-sufficiency, we are preparing our divisions in advance for the dispersion and fluidity of atomic operations. After experimenting in atomic maneuvers with a mobile force—comparable numerically to a battalion—one division commander voiced the opinion that three such mobile forces could have accomplished the mission in the given situation as effectively as his entire division employed conventionally.

To gear our mobile forces for the rapid responses demanded by atomic battle, cumbersome troop-leading procedures are being eliminated. Instead of formal field orders, simple code signals are being used to set rehearsed tactical plays into motion and to control them.

Work with mobile forces has stimulated the entire Army's response to the requirements of atomic battle and helped us to "break the crust of custom." Especially important is the effect it is producing upon the ability of young troop leaders to **THINK** in new terms and to handle combined arms decisively.

Our measures of adaptation for atomic battle with the means already available to us have not been confined to Army doctrine alone. We have been working closely with our tactical air teammates to produce a new *air-ground operations manual*, published in September, 1957, which revises and modernizes an earlier, now obsolete text.

**A**MONG its other advantages, our new joint doctrine will help us to implement the "Army Operations Center"—a new concept which ties together in one coordinated agency all the means now available to assist the Army Commander to place his firepower and keep his maneuvering elements of Infantry and Armor where he wants them. It is a modernized version of the former Fire Support Coordination Center, but with Air Defense, Army Aviation and Electronic Warfare added. This concept will be implemented both at Corps and Field Army levels under G3 supervision. Concurrently the old unwieldy Joint Operations Center is discarded and the Air Force will establish small mobile Air Support Operations Centers (ASOC's) to work with the Army.

During the coming year, we hope that we will achieve a comparable measure of agreed joint doctrine for airborne and amphibious operations. Certainly there is a need for us to bring all of our joint tactical doctrine up to date. Every day we waste in resistance to change now may be paid for with the blood of blunders in future battle.

In all our past wars, the United States has been forced to develop tactics and tools that could meet the *enemy's* standards *after* hostilities were initiated. This must never happen again. In the future we must insure that it is the enemy who has the disadvantage.



A highly important step in this direction was taken with the establishment last year of a field laboratory at Fort Ord, California, where academic theory pointing to new doctrine can be validated. The name of our field laboratory is the "United States Army Combat Development Experimentation Center"—or CDEC in verbal shorthand.<sup>1</sup>

Already we are beginning to receive valuable thoughts in many areas that I have mentioned. For example: Realistic field tests show that offensive and defensive tactics of the future tend to merge into one with but a single goal: *Fix the enemy for the kill!* Often, tactical firepower alone can accomplish the purpose of maneuver. As a corollary, fire support capabilities will often determine plans of rapid maneuver to a degree never known before.

In future battle, portrayed at Fort Ord with all of the realism that modern scientific technology can produce, it has been clearly demonstrated that cumbersome troop-leading procedures, detailed orders and improvised tactical groupments of the past can be dangerous. Experiment confirms the necessity and practicability of rehearsed tactical plays by combined arms teams such as we are employing in our Mobile Forces Program.

In addition to refining and testing operational concepts resulting from deductive analysis, CDEC experimentation is beginning to provide valid ideas for the development of methodology for testing future combat formation. At the moment, we do not know what the composition of the Army's basic fighting element will be in 1977; but CDEC's field explorations to date indicate that the need to increase our firepower-manpower ratio will continue to accelerate. More and more as time and technology advance, operations will consist of the coordinated efforts of small, powerful, self-contained units with vastly increased ground and air mobility.

In summary, here are some of the tactical characteristics of future ground operations as they now appear to us:

We see no lines of entrenchment as we have known them in previous wars. No masses of men waiting in reserve. No roads jammed with trucks moving to the front. In fact, we see no front. Only a battle area!

**W**ITHIN the battle area, to a depth of as much as a hundred miles or more, we see small mobile units deployed at intervals measured in miles instead of yards. While their numerical strength per unit may or may not be much greater than a reinforced company of World War II days, their firepower can exceed that of our old regiments and include all of the trajectories of divisional artillery. With this firepower, they dominate the unoccupied ground between them. When the units move, they are guarded against radiation and blast by a protective skin. At rest they are dug in for all-around protection and camouflaged.

Even the language of operations employed here differs from that of the past. New concepts call for new definitions of old terms—even new words to convey our thoughts. For instance, the word "defend" no longer means what it did in World War II parlance. In some situations, an order to "defend" actually calls for aggressive action to knock out an enemy unit before it can launch a coordinated attack. Under the conditions of

atomic battle, taking and holding the initiative is more important than taking and holding a hill.

In offensive operations, combat units move rapidly and operate in widely dispersed formations. When necessary, units concentrate sufficiently to accomplish the mission, then quickly disperse. Aggressive offensive action is continuous whether by fire or maneuver or both. As in the past, tactically important terrain must be fought for and controlled, but it is selected carefully and used as a means to control the battle, destroy enemy forces, create favorable opportunities for use of our own atomic weapons, for line of sight electronic devices and to deny the enemy similar advantages.

The tactical defense is fluid with units shifting their positions frequently according to an overall plan. The entire front is screened by covering forces, whose elements may resist fiercely, withdraw without resistance, counterattack violently, or even attack in apparently illogical patterns. The purpose of these deceptive operations is to confuse the enemy, induce him to commit his forces prematurely, create attractive atomic targets and provide the opportunity for offensive action to destroy him by fire and maneuver.

Long-range fires—atomic or nonatomic—can be placed instantly anywhere in the battle area necessary to influence the course of operations by guided missile batteries which are located deep in the rear. The exact distance to the rear that these supporting weapons must be located to accomplish their mission depends upon so many variables of situation and geography that it is impossible for anyone to predict today. Consequently, I consider it dangerous to fetter our development now with arbitrary limitations of ranges and rigid definitions of the future battle area which the enemy land forces may choose to ignore. It is the uncertain depth of the battle position that prompts my concern—not an ambition to stamp "U. S. Army" on the moon! I just hope that our united efforts will put us there first as well as safeguard our way of life here on this earth.

Another aspect of our concepts for future battle that has been misinterpreted by the press is that of "depopulation." Decreasing the average number of men per square mile in no way decreases the total number of men that will be needed within a vastly deeper battle area. On the contrary, the casualty-inflicting potential of modern weapons renders it much more probable that we will need more trained men for future ground combat than ever before.

Familiar as you are with the maximum destructive capacity of *strategic* nuclear weapons, and schooled as you are in the current doctrine for their employment, some of you may question their effect upon the feasibility of these tactical concepts. "Of what avail," you may ask, "is ground dispersion, flexible organization and improved mobility in the battle area of the future against the threat of thermonuclear weapons which even now could obliterate or contaminate an entire theater of operations in a matter of hours? . . . Upon what assumptions regarding the enemy's restraint in the application of nuclear firepower to the battle area are these tactical concepts based? . . . And what assurance is there that the enemy's restraint will hold under the stress of tactical reverse and impending defeat?"

<sup>1</sup>The story of CDEC appears in this issue commencing on page 18.



The basic question posed by this line of inquiry is neither new nor nuclear. Nor is it posed to the Army alone. The problem of where the line will be drawn between the *absolute* and the *discriminating* application of force in war has always been with the profession of arms. And never has the final solution been known in advance.

As Chesterton once said, "*ART consists in drawing the line somewhere!*" But even the artist cannot predetermine precisely where he will draw it. He can only provide himself with all of the means to draw it well.

So it is with the ART OF WAR

While Army doctrine recognizes that there are probable limitations to the force which people will apply—particularly at a time when unlimited force could so swiftly destroy mankind—we draw no lines in advance for the enemy to circumvent or ignore. Our tactical concepts for future land operations make only these assumptions:

1. That our enemies have no more intention of bequeathing the world to the oyster-boring sea worm than we have!

2. That our teammates in the Armed Forces will work in close unison with us and will continue to develop the tools and men to perform their roles in support of our common effort!

3. That the American people will never sell their sons, their freedom, and their national honor down the river!

So assuming, the United States Army is going ahead in its own area of responsibility planning and developing the means to play our part on the *tri-service team*, to enforce our national policy and to insure our national survival!

When I accepted the invitation to address you today, one of the points that I was asked to discuss was the *basic* conflict, if any, between U. S. Army doctrine and the doctrine of the other services. I have saved it to climax my remarks because it is the point I wish most to leave with you.

In my opinion, there is no *basic* conflict in doctrine whatsoever between the Army, the Navy and the Air Force!

Despite what I sometimes read in the pages of our service journals and the staff studies of our word-bird Indians, I refuse to believe that the doctrine of any service is chained to the obsolete concepts of the gunpowder age. I refuse to believe that the fundamental doctrine of any member of our tri-service team was dictated once and forever by an Italian staff officer named Douhet and a Prussian staff officer named Clausewitz. What could be more absurd in our nuclear age than the precept of Clausewitz that any attempt to limit the application of force in war is an "absurdity?" What could be more suicidal than to rely solely upon Douhet's shortcut to victory in an age when his shortcut is a 2-way street to total destruction?

I believe that the Army is not alone in recognizing that a dynamic change has taken place in our military environment during the last decade—not alone in realizing that we must think anew if we are to respond anew. I believe that professional thought throughout the services is moving rapidly in the same direction—toward the concept of a full scale of flexible and usable force for a

flexible national strategy! I believe that the American people are moving toward the realization that they must sacrifice much of the frosting on our standard of living in order to keep the cake!

I believe that we are moving toward all of this in our public and professional thinking but I am equally convinced that American minds and hearts and hands must move faster now than ever before. As always the race is to the swift and laggards die ignominiously!

It is true that there are some points of surface friction between the three services as we move in the same direction—particularly where our roles, missions and means overlap. But whoever heard of a good suit of armor that did not overlap at vital points? How safe would our national armor be without some overlap? Who cares if it rubs a bit now and then if it makes our country safer?

SOME of our surface friction even produces creative sparks which illuminate the path for all of the services to follow—particularly in the field of research and development. It is imperative, however, that all services receive the benefit of these creative ideas. They should never be hoarded, snuffed out or dampened by bureaucracy or false economy.

There is one kind of surface friction between the three services that we certainly *can* do without: Public bickering and parochial ballyhoo! For a member of one service to knock the legitimate needs of another service in order to promote public esteem for his own is a disservice to all. We should unite our public information efforts and show the American people why we need more dollars for their tri-dimensional defense.

There remains a final bench mark that I must "X in." It is the apex of all military doctrine—the timeless principle of Unity of Command. Sometimes I call it the "I" factor in war to distinguish it from the "Committee" concept of command. Executive committees may work very well for running an industry or business corporation, but not in battle—the big business of our profession. I have yet to see a committee that could vote a battle group up a hill or a bomber over a target. It takes one man who is not afraid to say "I" and face the consequences! One man with the professional competence to know what to do, the guts to decide to do it and the dynamic leadership to inspire other men to do it with him.

In Europe, right now, Army troops are commanded by an Air Force general; in the Pacific by an admiral. That suits our tri-service doctrine to a "T". Regardless of the mission or composition of the joint forces involved, we believe that individual capacity for tri-service command should be the decisive factor in selection. Military command requires the best man for the job and the absolute loyalty of subordinates!

Doubtless some of our key commanders for joint operations of the future are here in this room. Some day one of my grandsons in Army Green may have the privilege of serving under one of you in Air Force Blue. If so, I trust that he will be commanded by a man who is more than a scientist—more than a tactician. For our country's sake, I hope that he will be commanded by a man who knows by heart the art of war and what Stephen Vincent Benet with poetic insight called: "The uses of a hill!"



*The Army's capabilities to fight a war of the future and the role of the Combat Development Experimentation Center are discussed in*

# COMBAT SURVEILLANCE REQUIREMENTS

By **BRIGADIER GENERAL FREDERICK W. GIBB**

**T**HIS article on the US Army Combat Development Experimentation Center's role in developing combat surveillance requirements could be presented in one of two methods. I could use this article as a vehicle to extol the virtues of CDEC with a smattering of combat surveillance requirements woven in, or I could truly examine the "why" and "how" of combat surveillance requirements, and mention CDEC's role in its proper relationship to the bigger problem. To the readers of this magazine I am sure the virtues of CDEC must be apparent and so I have chosen the second approach.

This article will cover three areas. Firstly, I will examine the fundamental factors which establish combat surveillance requirements. Secondly, I shall then establish the relationship between the capability to meet these requirements, and the Army's ability to

fight the type of war envisaged in the future. Thirdly, I shall cover CDEC's role in this vitally important area.

## Concepts of Modern Warfare

The most significant factor affecting our future concepts, is the introduction of atomic weapons to the battlefield, and it is essential that the bulk of our thought and effort be directed toward the exploitation of the potentialities of these weapons, and solutions of the problems related to their use. The philosophy of the Army in facing this problem is based on the following points.

First, we must attain the best possible capability for waging atomic warfare, with the proper recognition of the requirement to be prepared to engage in a war in which there is a constant threat of the use of atomics, but in which atomic weapons may not be used.

Second, we must have forces with superior strategic and tactical mobility, prepared to conduct operations anywhere in the world and in any type of terrain, ranging from sustained operations with major forces on the Eurasian land mass, to smaller scale operations in jungles, deserts, mountains or arctic regions.

Third, a modern Army to succeed on the battlefield of tomorrow must

excel any potential adversary in the fields of firepower, mobility and communication; although I have not included it as a specific element, the ability to properly utilize our firepower and mobility is to a great extent dependent upon a high combat surveillance capability.

I should now like to cover my concepts of future land warfare. When both sides employ or have the capability of employing atomic weapons, our offensive actions will probably resemble a reconnaissance-in-force, with numerous small bodies of troops operating at extended distances on a broad front, with the main objective of determining the configuration of the enemy, without offering a remunerative atomic target to him. Once the configuration of the enemy has been determined, atomic fires from divisional weapons or from missiles located far to the rear will be used to destroy him. This means then that the mission of the Infantry to find, fix, close with and destroy the enemy, is now, to find the enemy, to fix him for the purpose of creating an atomic target, to accomplish this mission without closing, and to call for destructive fires without risking the destruction of our own forces by the atomic blast which destroys the enemy. The value of terrain in offensive

**BRIGADIER GENERAL FREDERICK W. GIBB** is a 1933 USMA graduate. During World War II he served in Europe with the 1st Infantry Division in various capacities. He commanded the 16th Infantry Regiment in five campaigns. Returning to the ZI he attended the 1st Command Course. Serving a tour at The Infantry School he next attended The National War College and was assigned to the Army General Staff. He returned to Europe as the Chief of Plans and Operations, ALFSE. Returning Stateside he served on the Army General Staff prior to his present assignment as Commanding General, CDEC, Fort Ord.



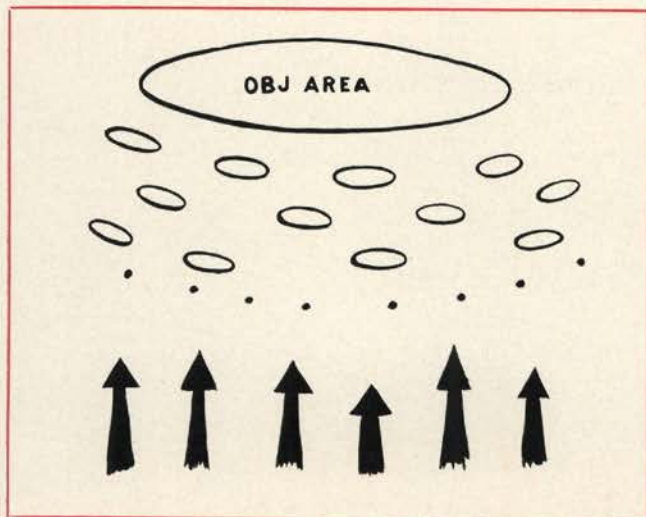


Figure 1

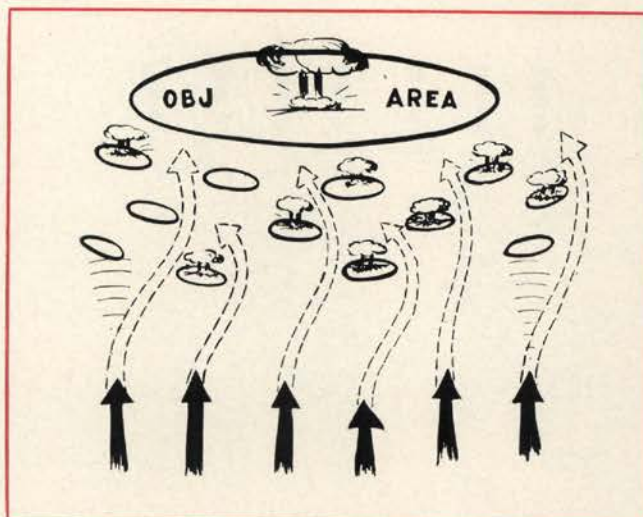


Figure 2

operations need not, as in the past, represent an objective which must be physically captured at all costs. Instead terrain may be used, along with other methods of influencing the enemy, to create traps which can become killing grounds for atomic weapons. Even within the framework of this concept, we cannot ignore the fact that full exploitation of our massive firepower will require continued utilization of our conventional weapons. Although we will seek to avoid actions in which we close with the enemy, we must be prepared to do so, but in so doing our goal must continue to be to force the enemy to react to us in such a way as to insure his destruction by means other than massed riflemen utilizing rifles and bayonets as principal weapons.

For a concept of an offensive operation involving a unit advancing on a wide front in which we can analyze the requirements for a successful application of this concept, refer to *Figures 1 and 2*. In *Figure 1* we have assumed as our objective a major enemy-held area protected by separated islands of enemy resistance disposed in depth across a wide front. We have also assumed that the method of advance of the attacking unit is characterized as a fast moving, elusive reconnaissance-in-force with many small, mobile

units moving forward in dispersed formation, seeking out the configuration of the enemy, without presenting a remunerative atomic target.

Ideally, the configuration of the enemy is determined without closing. In *Figure 2*, atomic fires from divisional weapons or missile units far to the rear are applied. Sufficient islands of resistance to insure the disruption of the defense, are destroyed, the objective area is placed under atomic attack, and our mobile forces move quickly through the area exploiting the effects of the atomic attack, destroying the remaining elements of the enemy and preventing him from organizing any further effective resistance.

Before I discuss the requirements for combat surveillance under these

conditions, I should like, briefly, to consider the concept of defensive operations on a battlefield on which troops are widely dispersed.

Defense under these conditions connotes the occupation of a deep and broad area, by forces which are capable of excluding or ejecting the enemy without offering remunerative targets which can be detected and destroyed by the enemy's atomic capability. (*Figure 3*) Such a defense carries implicitly the necessity of screening the periphery so that reconnaissance detachments of the enemy cannot punch through and determine the configuration of our forces. In other words, a counter-reconnaissance mission including counter-surveillance becomes a very important part of this concept, to hold the enemy at arm's length while

seeking to force him to concentrate in order that he may be destroyed by a lethal atomic blow. Dispersion and concealment on the part of the defense are essential and as described before, we will have occasion to use conventional weapons to deal with infiltration of small enemy forces at short ranges. And again under defensive situations, terrain must be restudied as a means to assist in creating enemy targets as well as an aid to us in limiting the effectiveness of enemy atomic weapons.

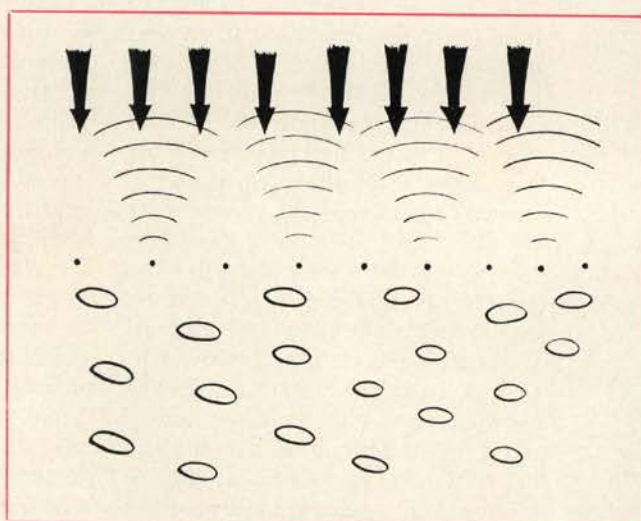


Figure 3



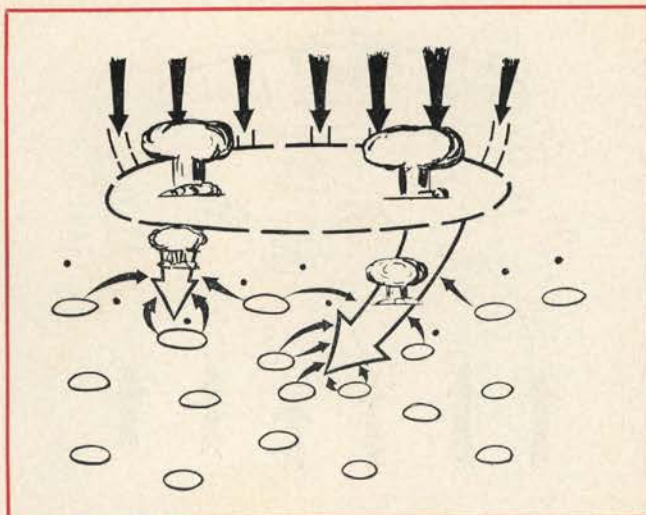


Figure 4

If we assume that the enemy will employ essentially the same basic tactic which I have described in our offensive concepts, we can anticipate a series of probing actions all along the front, with no attempt to close, but merely to determine the configuration of our major position. If we permit this to happen, the effects of the enemy atomic attack followed by exploitation will probably be successful.

If, however, we prevent the enemy from doing this and force him to concentrate before he reaches our position, we may again apply our atomic power on these concentrations (Figure 4) in such a way as to destroy the continuity of his attack in the rear while we destroy those forward elements which have penetrated our defensive position, by conventional means or by small yield atomic weapons.

I would like to discuss briefly the logistic system which we must develop for the future. No longer will we be able to establish large complex dumps close to the front lines without risking their destruction, with a concurrent adverse effect on our ability to fight.

It is considered, as indicated in Figure 5, that major dumps will be several hundred miles to the rear of the battle zone. The daily requirement for ammunition and supplies will be moved into the battle zone in

quantities required for a particular unit to accomplish a particular mission during a specified time frame, and at no time should we expect more than two to three days of supplies to be in forward dumps. This system will not permit the expenditure of millions of tons of ammunition to be fired searching for an enemy, but it must be used rather to either destroy the enemy, or to force him, without necessarily killing him, into an area in which he can be destroyed by some other larger weapon.

#### Requirements for Combat Surveillance

I shall now discuss the requirements for combat surveillance under the concepts of warfare just reviewed. We have always known that in order to destroy an enemy we must be able to locate him. If we wish to proceed from one point to another in an area in which there is, or may be an enemy, and we wish to avoid him, we must of necessity know his location in order that we may properly choose our routes. In past wars, in many instances, we located the enemy only when he shot at us. We developed his position by a slow and laborious movement of troops supported by small arms and other conventional weapons. This is not the environment at which we are looking today. We are concerned with the dispersion of forces in operations on a battlefield in an atomic age, where inability to move rapidly, where concentrations of men and matériel which were

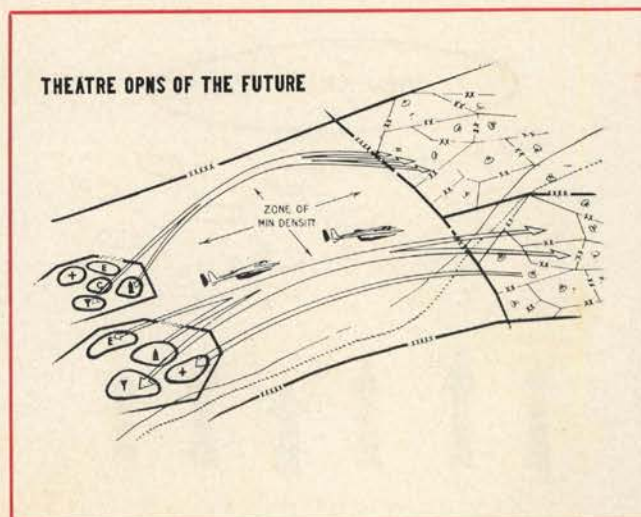


Figure 5

deemed essential to success in the past, are certain to bring defeat. Peculiar to the concepts which we have just reviewed are three fundamental factors which establish most of our combat surveillance requirements. These are—

1. The range and power of our weapons system.
2. The relatively great distances between friendly elements.
3. The speed of movement.

The commander to whom a given weapons system is furnished, must also have the capability of locating targets appropriate to that system, and of assessing the results of his fires. Thus, the range of the weapons system available to him establishes a requirement that our commander have a surveillance capability equal to the usable range of our weapons.

Soviet doctrine stresses the tactic of hugging his adversary as a defense against atomic fires. This, of course, is logical, based upon a known and appropriate refusal on our part to subject our own troops to the effects of friendly atomic fires. On the atomic battlefield wherein great distances between units will be normal, only by knowing the enemy's size, location and direction of movement can we prevent the application of "hugging" tactics. Our commanders must also have a surveillance capability to cover the area between their units and adjacent units.

To reduce the vulnerability and to



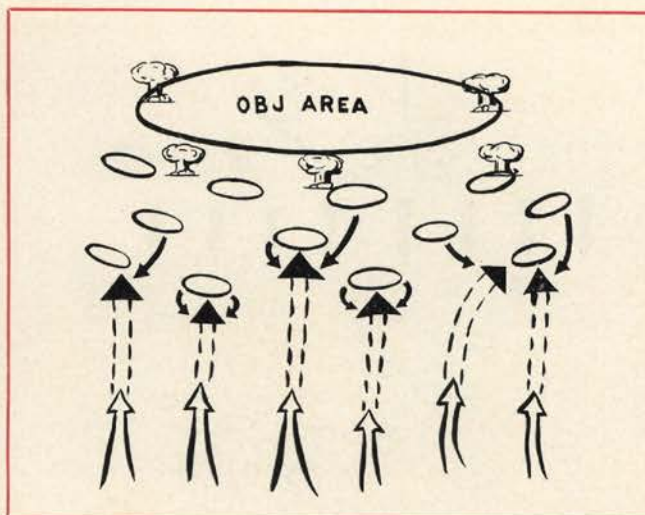


Figure 6

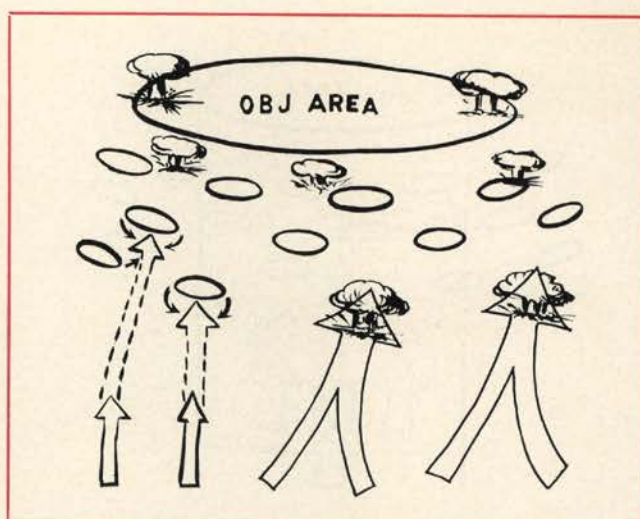


Figure 7

exploit the results of our massive firepower, our forces must be able to move on the battlefield at greatly increased speeds. At the same time, however, our forces will not be designed for the assault of non-located, strong enemy positions prior to their being subjected to devastating fires. Thus, the speed at which we must move establishes a requirement that we have a surveillance capability to a distance which, when translated at the desired speed, to time, must be greater than the closing time and the delivery time of our massive firepower.

Let us now briefly review the concepts of future operations with these fundamental factors in mind.

As indicated previously, in *Figure 2*, the offensive concept is based upon—

1. The rapid advance of many small, separated, self-sustained units over a wide front.
2. The ability, without closing and without offering a remunerative target, to locate and destroy the enemy by fire.
3. Exploitation of our atomic fires by the movement of fast mobile forces through the enemy's position to insure his destruction before he can rally from their effects.

Let us now take a look at the probable results of this type of operation without adequate combat surveillance capabilities. (*Figure 6*)

Without combat surveillance to a

range commensurate with that of the speed of our movement, and of our means of delivery of atomic firepower, such firepower would either not be employed, or would be expended with questionable results on suspected, rather than known, enemy locations. Our mobile forces would, without warning, find themselves engaged in fruitless close combat with an enemy quantitatively superior in manpower and conventional matériel. Thus, defeat with conventional weapons—if dispersion is maintained, would be probable.

If, on the other hand, our forces concentrate to defeat the enemy, they would merely create targets for enemy atomic fires. (*Figure 7*) Enemy concentrations by-passed by our widely dispersed columns, because of our lack of knowledge of their existence, could strike us in flank and rear without warning. The sad but obvious fact is that without adequate combat surveillance, this concept cannot succeed nor have we a satisfactory alternative.

If we return to the narrow frontages, slow movement, and massive formations, employed in World War II, this would merely assure our destruction by other means. (*Figure 8*)

Looking again at the concept for defensive operation, it is emphasized that the concept is based upon—

1. Widely dispersed forces occupying a broad deep area.
2. An effective counter-reconnaissance including counter-surveillance system.

3. The ability of these forces to cause the enemy to concentrate and canalize his movements thereby forming remunerative targets.

4. By movement and the application of conventional firepower in the event of local penetration.

As shown in *Figure 9*, without combat surveillance capabilities—

1. Long range random fires aimed at a suspected enemy build-up would probably be ineffective.
2. Distances between our forces would not permit adequate coverage by ground forces to deny the enemy knowledge of our configuration.
3. The logistic system cannot support continuous reconnaissance by fire as a protective measure.
4. The enemy forces could close with and engulf our dispersed forces and insure their defeat by conventional means or, if forcing our concentration, could destroy us with his atomic weapons.

We would thus place ourselves in the position into which we had hoped to force the enemy by our offensive tactics, and without adequate surveillance our defeat would probably be assured.



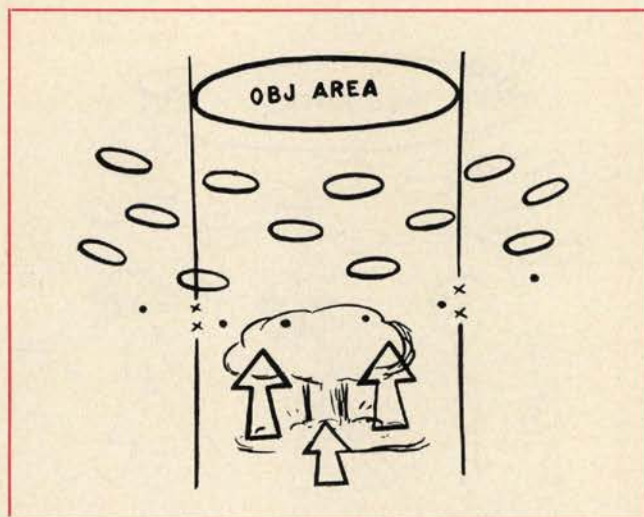


Figure 8

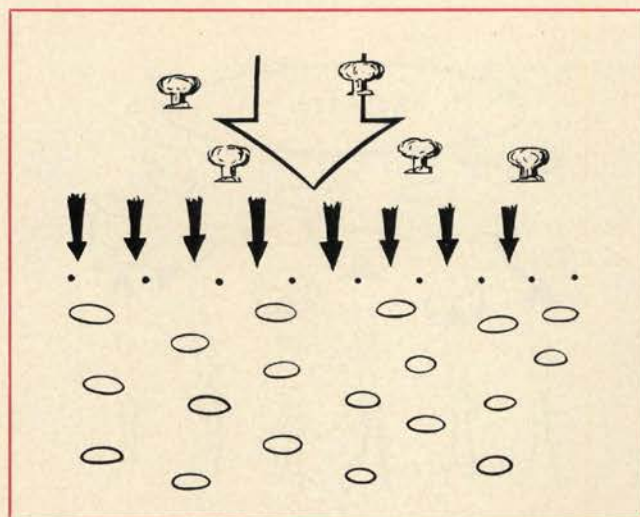


Figure 9

Before I describe CDEC's role in developing combat surveillance requirements, I would like to place it in its proper perspective in the overall Army combat development system.

Research and development agencies of the Army have already produced some truly revolutionary weapons and items of equipment, and can be expected to continue to do so. In addition to the programs for matériel development, continuous study and experimentation must be conducted to determine the combat applicability of such weapons and matériel, and to discover and report new matériel requirements based on tactical concepts. This latter responsibility rests upon the Commanding General, United States Continental Army Command, known under the short title of CONARC.

The Commanding General, CONARC, is charged with the responsibility for evaluating the effects on tactical doctrine of new scientific developments. He likewise has the responsibility of developing requirements for new weapons where necessary to meet the demands of new tactical concepts. This responsibility, and the combat development effort derived therefrom, is often mistakenly identified with the pure matériel research and development effort which results in the creation of specific weapons and items of equipment.

In order to clarify the meaning of "combat developments" as I shall use it here, it is defined as "the development of information on the combat

applicability of new concepts, organization, tactics, techniques, weapons, and equipment, and the application of that information in the synthesis of an effective fighting system."

To achieve the desired results within this framework, a combat development program must work toward a five-fold objective.

*First*, it must examine the Army's offensive and defensive effectiveness, under a variety of assumptions of enemy weapons and tactics, under varying conditions of light, weather, terrain and the like.

*Second*, it must incorporate the most modern weapons into the fighting system.

*Third*, it must look ahead and anticipate the changing battlefield conditions, and the problems brought about by scientific and technical advances, that may force combat proven weapons and procedures into obsolescence.

*Fourth*, it must prepare for startling innovations in tactics and techniques, that may completely outmode established weapons, equipment, methods of operation and doctrine.

*Fifth* and finally, to make up for a lack of experience in many new areas, it must provide intensive field experimentation, to supplement analysis, and to provide an arena in which new theories can receive the acid tests of practical application.

To discharge his overall combat development responsibilities, the Com-

manding General, CONARC, has a widespread combat development organization.

There is a principal control and coordinating group at Headquarters CONARC. In addition, there are combat development groups at most service schools, and at various other installations both in the United States and in certain overseas areas.

A review of the combat development program in 1954, by the Harworth Committee, found the existing effort not fully adequate in the practical testing of theories by field experimentation. A need therefore was established for a combat development agency devoted to scientific experimentation, divorced from external training requirements, located in an area in which experiments could be conducted, and staffed with military and scientific personnel and experimentation troops, dedicated solely to the task of producing unbiased factors upon which decisions could be based.

#### The Role of CDEC

To fill this need, the US Army Combat Development Experimentation Center (or CDEC), a field agency of Continental Army Command, was established on 1 November 1956 at Fort Ord, California, as an integral part of the overall combat development effort of the United States Army.

CDEC's mission is, "to assist the Commanding General, CONARC, in the discharge of his responsibilities, for the development of, and experi-



mentation with, concepts, organization, doctrine and procedures for the Army in the field."

The more important functions of CDEC are:

1. To prepare, conduct and evaluate, with maximum objectivity and scientific control, experiments with concepts, organizations, doctrine and procedures for future combat, as directed by the Commanding General, Continental Army Command. This function includes experiments for the integration of new matériel into organizations.

2. To design and establish experimentation methods and procedures for the accomplishment of function 1 above.

3. To apply scientific analysis to solutions of combat development problems under consideration.

A staff of 54 officers, 20 scientists and a force of roughly 3,000 men, have been assembled at Fort Ord, California, to perform these functions.

The experimentation program at CDEC is geared to a three-year cycle, with experimental objectives in both the mid-term, and long-range time frames. The goal of our mid-term program is to determine through experimentation, adequacy of the organization, weapons, equipment, tactics and techniques of employment proposed for an integrated combat group with its external combat and logistic support requirements with matériel which will be or can be made available by 1962.

The goal of our long-range program is to determine through experimentation basic information on tactics, organizations, techniques of employment and external combat and logistic support requirements for units indicated by CONARC as being considered for employment on the 1965-1970 battlefield.

Most of the major areas which will be investigated are—

1. Surveillance
2. Communication
3. Firepower
4. Mobility
5. Command and Control
6. Logistic Support

## 7. Vulnerability

I shall discuss the combat surveillance area in some detail, and I shall cover the remaining areas only in their relationship to surveillance requirements. I can assure you that the prominent location of surveillance in this listing is in no way related to the setting of this particular presentation.

In our mid-range program, experimentation will be conducted in combat surveillance at all levels within the Combat Group or its equivalent at the level of the Combat Group itself, and of certain elements of the division and higher surveillance systems. Information will be obtained on the adequacy of tactics and techniques, communication requirements, organizational structure and adequacy of the combat surveillance system, envisaged for the integrated combat group of the 1961-1963 era,

Technical assistance in accomplishing our investigations in the surveillance areas will be obtained from the Office of the Chief Signal Officer, from Project MICHIGAN which has established permanent liaison at CDEC, from the Army Electronic Proving Ground and from the Signal Corps Electronics Laboratory.

Experimentation in this time frame will place the surveillance system under consideration in the environment in which it is designed to operate.

In the remaining experimental areas, in both the mid-term and long-range programs, the combat surveillance requirements are woven throughout every area which we will investigate.

*Communication* will be examined in terms of surveillance requirements, as well as those of command and control.

*Firepower* will be examined in terms of the ability of the commander to acquire appropriate targets and assess results.

*Mobility* will be examined in terms of surveillance capabilities and requirements, as well as movement rates, for as I have previously stressed, we cannot accept speed of movement alone as the criterion for this vital aspect of future concepts.

*Command and control* will be examined in terms of surveillance capabilities and requirements, as the span and area of control is so greatly influenced by the knowledge of the

enemy. This will include collection, collation, dissemination and presentation of basic intelligence information to using agencies.

*Logistical support* requirements for ammunition will be dependent to a large measure upon the effectiveness of firepower, and the degree of mobility which we can attain as a result of surveillance capabilities.

*Vulnerability* will be examined in terms of the dispersion we can attain, and this too is largely dependent upon our surveillance and counter-surveillance capabilities.

In our program, no attempt will be made to identify particular items of equipment or specific surveillance systems but rather our goal will be to determine the objectives to be achieved, and to indicate these objectives in such a way that they may be translated into specific items of equipment or systems.

Particular items of equipment which are made available to us will be thoroughly investigated to determine their tactical applicability, level of employment, the organization and optimum methods of use.

In closing, I would like to emphasize that a revolution has taken place in weapons. This revolution must be spread to concepts of operations, to tactics, to techniques, to doctrines and to the development of matériel which will achieve the maximum utilization of the power we have in hand and thereby provide us not only the tools that are needed to insure the success of future Army operations but their application to the battlefield of the future. Our fundamental approach to the many problems must consider the past and the present usable to some extent as guides to the future, but yesterday's doctrine, weapons systems and concepts must prove themselves adequate to tomorrow's task, or be discarded.

The surveillance problem admittedly is one of our greatest. The equipment and the systems we have today and which in many instances were developed to support concepts of operations which no longer exist must be closely scrutinized in light of the new requirements because without adequate combat surveillance, major changes in our basic concepts of operation would have to be considered.





(U. S. Army)

*The end sought in planning and executing an attack is brought about by deliberate planning and violent execution.*

# THE PLANNING OF BATTLE GROUP AND BATTALION ATTACKS

By **LIEUTENANT GENERAL BRUCE C. CLARKE**

**T**HE principles and techniques outlined below are generally applicable to company, battalion, cavalry regiment, combat command and division attacks as well as to battle group attacks. You will note they fall into five fundamental groups:

1. Troop leading.
2. Use and coordination of tanks and infantry.
3. Planning and coordinating of supporting fires.
4. Conduct of the assault.
5. Command and staff duties and relationships.

Airborne and infantry division, armored cavalry regiment, and combat command commanders should make this a subject of schools, sand table exercises and tactical walks or rides for appropriate officers.

## Training

The training philosophy applicable in Seventh Army

tactical units is aimed at the attaining and maintaining of a peak level of combat readiness. This can be achieved only through careful analysis of individual and unit weaknesses, establishment of high training goals and continuing effort to reach goals set.

Training, regardless of size of unit, has but one purpose, that is, to teach effectively the techniques of combat. The *attack* is the key to success; the defense is merely a temporary expedient to conserve forces for an *attack* elsewhere or to prepare for an *attack* at a future date.

The consequences of having an attack grind to a halt are great. The effort required for it to bounce back is tremendous. Once an attack is launched, its momentum must be maintained until the objective is seized and secured. Battle losses received due to poor planning and faulty execution are inexcusable and will result in loss of respect for, and confidence in the commander. The best reputation a commander can have is that he accomplishes his missions with few losses.



*Any commander who prepares a check list from this article will have a great aid in time of pressure. It will enable him to plan with speed instead of haste.*

The end sought in planning and executing an attack is brought about by *deliberate planning and violent execution*. The opposite is fatal. *Speed* in planning is often needed, but *haste* should be avoided. Remember that in combat there is no second opportunity and seldom opportunity for rehearsals.

### **Troop Leading**

What principal factors must be considered by a commander in *deliberate planning*? They are:

1. Mission (objective).
2. Enemy situation (what must I overcome to accomplish my mission?).
3. Troops available (combat, combat support and service). (What characteristics of these units and their commanders can I use to the best advantage?).
4. Terrain and weather.

The commander, once he has received an attack mission, develops initially a tentative plan. This plan can be developed only through careful analysis of the four principal factors listed.

*In analyzing the factors the commander must consider:*

How much time do my subordinate units and I have for reconnaissance, planning and the issuance of orders?

What general scheme of maneuver do I want to employ?

What formation(s) are feasible?

What is the mobility of my command?

How much dispersion can I achieve and still accomplish my mission with speed and violence?

What supporting atomic fires are planned for or available to me? For adjacent units?

How can I employ my conventional fire support?

What logistical problems will I have? Can I support the operation logistically?

What is the status of personnel and equipment?

How can I best use my supporting elements to include armored personnel carriers and helicopters?

Are communication facilities adequate? Can I communicate with my supporting units? Do their radios net with mine?

What flank security problems do I have?

How can I best control the attack? From where? What control measures?

What must I be ready to do next when I have seized and secured the objective?

### **Planning and Coordination**

Having analyzed these factors and having developed a tentative plan based on this analysis, the commander is ready to get down to details.

*These things must then be considered:*

What formation will be used initially? Mounted, dismounted or by helicopter?

What units will be in the initial attack?

What units will be in support or reserve?

What will constitute my base of fire?

Will forward assembly area(s) or attack positions be used for my attacking troops? If so, where?

When will the components of my fire support start? When will fire shift and stop? How will I arrange for this to happen?

How can I exploit the effects of supporting atomic fires?

From what position will each of my attacking elements start their attack by fire and movement? This is the true Line of Departure (LD) and should be considered as such. There may be other coordinating lines or points in the rear.

**LIEUTENANT GENERAL BRUCE C. CLARKE**, a 1925 USMA graduate, earned a Civil Engineering degree in 1927 from Cornell University. He has long been associated with Armor and the U. S. Armor Association. During World War II, he served in Europe with the 4th and

7th Armored Divisions. During the Korean Conflict he became a Corps Commander. Subsequently he was Commanding General, U. S. Army Forces, Pacific, prior to his present assignment as the Commanding General of the U. S. Seventh Army, stationed in Europe.



How and from what distance will I start a coordinated assault? What signal, command or contingent event will I use to start it?

What reports will I expect from my subordinate units? What reports will I give to my superiors? With whom should I establish liaison?

How, when and where should I issue my attack order? What arrangements should I make in advance for this?

### Conduct of the Assault

The commander, having come to a pretty firm idea of what he wants to do and how he wants to do it, *now war-games it in his mind and asks himself the following questions:*

To the maximum extent possible, have I based my plan on knowledge gained through active ground, map and aerial reconnaissance and knowledge of the enemy situation?

Have I analyzed the enemy defense thoroughly, thereby locating and taking advantage of weaknesses in enemy dispositions or in terrain where the defender cannot use his weapon or obstacles to advantage?

Have I given adequate consideration to terrain and weather? What effects do they have on the accomplishment of my mission?

Have I planned for maximum exploitation of available atomic fires?

Have I considered troop safety in the planning of my atomic fires and scheme of maneuver? Have I considered use of armored personnel carriers?

Have I considered the effects of atomic weapons upon the terrain over which I am attacking? Blowdown? Contaminated areas? Secondary fires?

Have I provided for the full "shock effect" on the enemy? This comes from surprise, tanks in strength, attacks from several directions simultaneously, intensity of supporting fires during the assault and speed of the assault by use of armored personnel carriers and helicopters.

Does my plan provide for weighting the main effort?

Have I used attacking units as a base of fire when I have artillery, heavy weapons and mortars for this purpose? The use of tanks for this purpose is especially faulty if the tanks can be used in the attack role to close with and overrun the enemy.

Has the excessive use of attack troops as a base of fire, as reserves, or as reconnaissance and security elements, caused me to have too little strength in the attack?

Have I selected unnecessary "intermediate" objectives which distract from the attainment of the final objective? Intermediate objectives facilitate control and maintain direction. However, too many such objectives destroy flexibility and initiative and tend to slow up the attack.

Have I determined the "time and space" factors of attacking units from the LD back to the assembly area(s) to insure that everything is set to go when units arrive on the LD?

Have I set the stage for the assault of all units to be started concurrently? The commander should endeavor, as does a football coach, to start all assault elements together. No one should be "off side." No one should start late.

Have I set the LD too far back? It should be as far

forward as can be reached without resorting to a fire and movement technique to advance.

Have I used my forward air controller, support artillery commander, mortar battery commander, engineer platoon leader, communications officer, assault gun platoon leader, reconnaissance platoon leader, surgeon and my staff in planning, checking and completing the details of my plans?

Have I considered the ammunition available to my fire support units? Are my supporting fires planned so that there will be no lulls during the critical phase of the attack? Have I given consideration to the use of atomic fires? To time fire over my tanks, if tanks are available? To smoke? To having my infantry follow closely the supporting fires?

Does my plan require holding up any elements during the attack to clear barriers or obstacles, thereby exposing my units to enemy fires while in a vulnerable position?

Does my plan of attack foresee and provide for the next step in case of success, partial success or failure? (This planning should in no way influence the violence with which the attack is to be executed.)

Have I given some unit the mission of watching and securing my flanks? Have I established liaison where called for?

Have I insured that after seizure of the objective, my units have a detailed plan for consolidation and reorganization so they will not "rest on their laurels" thus exposing themselves to a surprise counterattack and losses from enemy fires?

### Command and Staff Duties

Having war-gamed the plan in his mind, and being satisfied as to his solution, the commander then proceeds to the actual issuing of his order.

*It can be assumed that some time during the foregoing process, he has in addition considered the following:*

I must not take so much time making my plans and announcing my orders that my subordinates have inadequate time before "H-Hour." In case of doubt, I will send a staff officer forward to a subordinate commander rather than calling him back, or hold my conference for issuing orders well forward.

In order to avoid misunderstandings and overlooking important things, I must issue my orders in the standard sequence.

I must make sure that every commander knows what he is to do and when.

I must fire all with the need for vigorous execution of my plans.

If the answers to all of these are satisfactory, you and your unit are off to a good start. Do not later "second guess" your decisions and change your orders. Do not harass the subordinate commanders while they are planning, issuing their orders and getting ready to carry out their assignments. You and your staff should make such checks as are needed without violating this.

Once the attack starts, you can influence the battle by the shifting of supporting fires, maneuver and the use of reserves. You should be prepared to do this.

You should now anticipate what may happen so that you will be at the critical spot at the critical time to give that "command push" necessary to keep the attack going.



On occasion we have asked for members to contribute not only articles but material provocative enough to be considered for editorial content. The following editorial arrived here in this office immediately after we closed the last issue in which we had written "Cooperation Among the Services" which appeared on page five of the January-February Issue. We feel that "Let's Walk Before We Get Shoved" is a natural follow-up. It was written by Lieutenant Colonel Franklin M. Davis, Jr. who recently completed The Armed Forces Staff College. He is presently en route to MAAG, Cambodia.

For those who will believe their ears, the knell is sounding for the military services. The bell is tolling for the National Security Act of 1947, and when the current exhumations, dissections, autopsies and funeral orations are over, it is not hard to see who's still going to be shedding the tears.

The Army, the Navy, the Air Force and the Marine Corps can toss the same crying towel back and forth. Because what the whole hassle about Sputnik, missiles and inter-service wrangles boils down to is this: if the services don't solve the problems involved, somebody—the Congress, the President, the public—will step in and solve it for them.

Indeed, the solving is already in the mill. Opinions have been expressed on all sides, varying from the considered utterances of dedicated statesmen to the axgrindings of men who have never worn the uniform or seen a battle but are qualified in their own estimation as military experts. The net result, of course, will be to force a solution in one form or another, be it the U. S. General Staff concept already gaining credence and momentum on Capitol Hill, or be it an increase in the civilian operation already devouring the present national military defense structure in large gulps.

But whatever its direction, when the current solving effort is finished, the services will be relegated to a secondary role in providing experienced military advice to the national civilian leadership. This is the tragedy, this is for whom the bell tolls.

Because nowhere in the current hue and cry now engulfing the Pentagon from all sides has anyone outside the services given credence or acknowledgement to the two vital characteristics of the military that have guided this country's destiny on the battlefields from Lexington to Korea. These characteristics are: first, military experience gained the hard way; and second, the professional integrity of the national officer corps.

In the current scramble for solutions, in the current race to get the right tail pinned on the right donkey, the U. S. General Staff advocates seek a military staff Utopia which in general acknowledges experience but disavows professional integrity and duplicates a structure which, given a chance, already exists. The other solutions, depending on the extremes they take, deny service roles and missions entirely or advocate a revised service concept, thus sacrificing military experience first and the professional integrity of the national officer corps second.

At the same time, of course, perspective must not be lost by the military. General Hazel, the hard-bitten base commander in the Steve Canyon comic strip, summed it up as well as anybody when he said, "The same people

who squawked about jet engine noise now want to know why we don't have a Sputnik up."

But this is the nature of our country, our way of doing things. When something goes haywire, there has to be a change. Change corrects things. That is, it does when it stems from sound reasoning but it doesn't when it stems from fright. Change, *per se*, butters no parsnips and orbits no Sputniks.

Our military experience would seem to tell us, in all this, that the service roles and missions are changing; indeed, have already changed.

But looking at the broad spectrum of war which our national security effort must face, the military knows better than anyone else that the United States needs and will continue to need the best military advice—experienced military advice—it can get. So it's up to the services to square away the roles and missions and to keep faith with the professional integrity which is, after all, dedicated to the security of the country.

There is an answer, too. Right in our present structure. Let's put General Medaris, General Schriever, Admiral Raborn and their respective aggregations of scientists and technicians into a unified missile development command under the Joint Chiefs of Staff in an agency that might be called AFMOP—Armed Forces Missile Operations Project. In this project, the full weight of the three-service missile efforts, now proceeding at variance, can be coordinated and aimed at one single goal—giving the United States a missile weapons system responsive to the long-range, intermediate-range, tactical-range and missile defense needs of the three services in support of the nation in modern war.

Second, let's get the service wrangle back into context, back into honest differences of opinion among military experts, back into perspective and out of a life-and-death type of struggle over roles and missions. Let's have an *ad hoc* committee consisting of the service deputies—the assistant chiefs of the Army, Navy, Air Force and the Marine Corps—sit down with their feet up and provide the Joint Chiefs of Staff with the best solution that can be developed. This is required so that public confidence is restored, the statesmen and axgrinders are satisfied, and best of all, the country's best military advice remains immediately accessible to the national leadership from the people best qualified to give it—experienced professional officers.

Because, if we don't do this, if we don't walk before we can run in this era of missiles and satellites, somebody will give us a shove and we'll be tottering until the services stumble and fall. And then, don't send to know for whom the bell tolls. It tolls for you and it tolls for me and it tolls for national security.





(U. S. Army)

# Training *EXPEDIENTS* for Reconnaissance Units

By **FIRST LIEUTENANT STUART A. BECKLEY**

**I**N peacetime, the Army becomes involved in the many tasks which are necessary even though they do nothing to increase the operational effectiveness of the active Army. At times it seems to commanders that there is no hope for training. All effort is to be consumed

**FIRST LIEUTENANT STUART A. BECKLEY**, Armor, entered the service in 1951. Commissioned in 1953 from OCS he served with the 11th Airborne Division. Moving to Germany he served with the 2d Armored Division. Returning Stateside he was assigned to his present duty with the 82d Airborne Division, Fort Bragg, North Carolina. Nearly all his service has been with reconnaissance units in various type divisions which is his basis of experience for this article.

in commitments and troop requirements. What little time is left to the commander's discretion appears over-controlled by the numerous lengthy directives emanating from higher headquarters on the many programs supported by the Army including safety, information, education, recruiting, chaplains' activities, athletics and recreation. These activities seem to commanders to have priority over training. The missions of reconnaissance, security and combat seem unimportant when compared to all else that is directed and given priority. This will cause our units to stagnate and become ineffective unless aggres-

sive command action is taken. Although we cannot completely change this bleak picture of the peacetime Army, as commanders we must fight for the time with which to train. What is more important, we must make maximum utilization of what little time we get by producing superior training. Further aggravating the problem, specifically for commanders of reconnaissance, is the lack of available terrain in variation and quantity; this being the essential ingredient required in the training of the reconnaissance unit. There is not one post or training area in the United States which provides ade-



quate running room and varied terrain to accommodate even the smallest reconnaissance unit, the reconnaissance platoon. This means the reconnaissance commander at all levels is faced with an almost insurmountable problem in training. It is up to commanders to devise methods and expedients from which maximum training is derived from the time allowed and maximum utilization is made of available terrain, facilities and equipment. This article concerns expedients, which if aggressively employed, will permit the most garrison-bound reconnaissance unit to carry on sufficient training to sustain it through the first days of combat.

No matter what missions have replaced the tactical, there will always be leaders to effect them. The key lies in the training of the leaders and potential leaders; that we can do under the most abortive circumstances. This article, then, deals with orders group or leaders training expedients, touching only lightly on the training of the individual reconnaissance soldier. It can further be broken down into two major sections, the first entitled *Mapper Exercises* and second *Jeeper Exercises*. Both expedients are relatively easy to organize and conduct, and can be worked into ATP requirements and overriding support commitments without difficulty. All that is required is a four-hour block for the average mapper exercise and from four to eight hours for jeeper exercises. Both type problems can be conducted while other scheduled training is being carried out. This means that the commander should be able, once a week, to conduct one orders group mapper exercise and one jeeper exercise without interfering with other scheduled activities. If the commander can count on just this much time with his subordinate leaders he can be assured of excellent control of his unit and accomplishment of mission when called on for field operation.

### Training Standards

It is a foregone conclusion that to train an armored reconnaissance unit is by far the most difficult of the various combat units at each given echelon. Realizing this and the insurmountable problems facing reconnaissance commanders in the conduct of peacetime training, we must adopt

training standards for the individual reconnaissance soldier, the potential reconnaissance leader and the armored reconnaissance leader. If we are fortunate enough to attain the desired standards, they should be raised.

*The Individual Reconnaissance Soldier:* It is sufficient to insure that this group, made up of all basic skill level MOSs, is well grounded in the fundamentals of infantry soldiering and the operation and maintenance of that equipment entrusted to them. If, for example, the soldier is a reconnaissance tanker, he must be able to operate and maintain the light gun tank and the equipment affiliated with it. Likewise, the individual soldier of the reconnaissance rifle squad must, along with those basic infantry skills, be well versed in rifle squad tactics and in the use and care of those weapons and TO&E equipment assigned to that squad. The individual reconnaissance soldier's training program should be built around advanced individual and squad level subjects. This places the desired stage of proficiency at squad level.

*The Potential Reconnaissance Leader:* This select group includes those specialist grades slated to assume command position. This is due to normal fluctuation of NCO strength or because of demonstrated ability. The group, training-wise, must be carried one step further than the individual reconnaissance soldier, into

combined arms training. This is to develop in the prospective leader an awareness of the wide range of subjects encompassed in reconnaissance unit operation. The training of this group can be accomplished by integrating the potential leader into the unit's leaders or orders group training program.

*The Armored Reconnaissance Leader:* This group is composed of the subordinate leaders of a command making up the orders group. (Those who lead the separate elements of the major unit, be it platoon, company or battalion.) This article is concerned mostly with the training of the orders group, and goes into detail on practical training expedients that can be used to effectively train these leaders.

### Mapper Exercise

The tactical mapper exercise is designed to meet the need for reconnaissance orders group (leaders) training when operating conditions prohibit sufficient field training time. These "signal calling sessions" enable garrison-bound commanders at all levels to teach, familiarize and sharpen their subordinate commanders and staff in the interpretation and use of unit field SOPs, SOI items and map play. Integrated in these exercises are the numerous techniques incorporated in field operation including: radio-telephone procedure; spot, shell, route reconnaissance and after action report-



(U. S. Army)  
This classroom layout shows all the equipment required for Mapper Exercise.



ing; terrain appreciation and evaluation; interpretation and use of radio-issued operations orders; and battle drills as applied to mission, terrain and tactical situation. All the aforementioned can be applied practically through the use of the tactical mapper exercise. The exercise can be conducted in the average size classroom using only equipment available to company or battery level units. The classroom layout can be organized with little difficulty and, once a system for organizing is effected, the layout can be set up over and over again with little effort. The conduct of the exercise can be perfected to the extent of using a standard scenario format at each exercise, merely changing coordinates and other variables to meet the requirements of each different problem. The end result is a highly effective orders group training aid which can be utilized with a minimum of preclass preparation. It should be noted that this exercise calls for a complete field SOP and the incorporation of standard battle drills in unit field operation. They are the foundations for all tactical maneuvers of the reconnaissance unit. Without standard map play codes, battle drills and reporting procedures, no reconnaissance unit can function effectively.

As described in this article, the exercise is designed to function best with a class of 15 students, noncommissioned or commissioned officers. Of course variations to expand its potential may be employed. This depends entirely upon the initiative and ingenuity of each commander or instructor. For the sake of simplicity, I will discuss the training expedient as I have perfected and troop tested it, leaving further development to each user. The following materials and equipment are required in the conduct of the exercise:

**Map Coverage:** Map coverage of the selected area should encompass an area 50 miles square, and can be secured or extracted from the unit training load. Either four copies of the same scale of the given area or one each of the given area in different scales with an instructor copy should be amassed. Once an area is selected and map coverage amassed, store it in a separate container referenced for easy inventory and selection, preventing the use of these maps for anything other than the training

expedient. I have amassed area coverage of a section of West Germany which permits the conduct of problems involving any possible type of terrain. I am able to select the terrain to match the skill level of the class and the type problem I plan to run. In the United States, unlike Germany, it is difficult to amass a map coverage of an area encompassing all terrain types, since in no one 50-mile-square section can all terrain types be found. Further it is desirable to select an area close enough to the unit's station to permit running follow-up jeepers and field problems.

**Film Coverage:** A motion picture film library should be established: approximately 30 minutes footage of each terrain type (plains, low hills, plateaus, semi-mountains, mountains) should be available as backup for the maps. It serves to establish a ground to map relationship; at present few leaders are able to read terrain from a map describing the ground in detail. The film coverage will help to develop the understanding of map-ground relationship as well as establish for each specific problem a picture of the ground used. The film footage need not be of the same ground covered in the map coverage. It should be catalogued by terrain type and would apply anywhere that specific terrain type is found. If it is impractical for the unit to provide its own film footage, as I have, standard training films available at any film library can be utilized. In every company or battery unit there is at least one officer or noncommissioned officer who takes home movies. It is possible to make use of his equipment in both taking and showing movies in conjunction with the tactical mapper exercises. (NOTE: another use of home motion picture equipment is the photographing of units participating in field training exercises. The commander arms himself with film and camera to shoot all errors in camouflage discipline, use of defilade, battle drills and formations. On return to garrison the commander uses those films in conjunction with his critique of the exercise in much the same manner as a football coach reviews past games pointing out to his squad errors in blocking and line play.)

**Tape Recorder:** The tape recorder (not presently available for issue to troop units) will become available

through the same agencies as are motion picture projectors. At present PIOs at division and higher level units have this equipment. If not available, a simple arrangement can be set up as a substitute. A quarter-ton truck mounting a standard radio with the speaker placed in the classroom and the operator, an assistant instructor, outside with canned messages will serve the same purpose. The purpose of the tape recorder or radio arrangement is to instill radio-telephone procedure; use of radio in the issuance of full mission type operations orders; spot, shell, route reconnaissance and after action reporting; and the use of unit field and brevity codes which should be covered in the unit field SOP but receive too little actual practice. This tape recorder or radio arrangement also injects enemy situations and enemy contact reports.

**Conduct of the Exercise:** Now that we have listed the required equipment we shall set up a tactical mapper exercise and move through an actual problem to show the conduct of the exercise. Initially the instructor must select an area in which to run the problem. In doing this he must take into consideration the class skill level, missions to be covered, and practicability of follow-up jeepers and field problems. After selecting the terrain the instructor pulls those maps required and appropriate film coverage. The assistant instructor sets up the three student map layouts and the instructor map layout, secures requisitioned equipment such as motion picture projectors and tape recorder, and prepares the classroom. The instructor then drafts a training SOI including call signs, brevity code, and map play items. (This should be covered in the unit field SOP.) A copy of this training SOI should be available at each student map layout to be superimposed on the maps by the students on arrival at the classroom. A series of problems are then planned by the instructor to cover the required time. Instead of preparing a lesson plan, the instructor draws up a scenario listing the situations and requirements of each problem. The first student requirement is to properly interpret the training SOI and apply the map play items to each student map layout. The second requirement is to build a word picture of the terrain from class participation



covered on the map layouts on which the problems are to be run. After the instructor is satisfied that the class is aware of the type, capabilities and limitations of the terrain, he follows up the discussion with 15 minutes film footage of like terrain to firmly establish a ground-map relationship. Once this all-important ground-map relationship has been established, the instructor initiates the problem by issuing a general situation which lists what normally is covered in paragraph 1a of the five-paragraph field order. After the class has been briefed on the general situation and the terrain, the instructor issues his first operations order which might be in the form of a five paragraph field order or mission type radio order issued by tape recorder simulating the radio transmission. I tend to stress radio issued orders as they are the hardest to standardize and understand. The next student requirement is to place the received order upon the map layout. Once this has been satisfactorily accomplished, the problem moves at a speed dictated by the instructor. Discussion evolves around tactical employment and the use of battle drills as applied to the specific terrain on which the problem is being run. Specific missions of subordi-

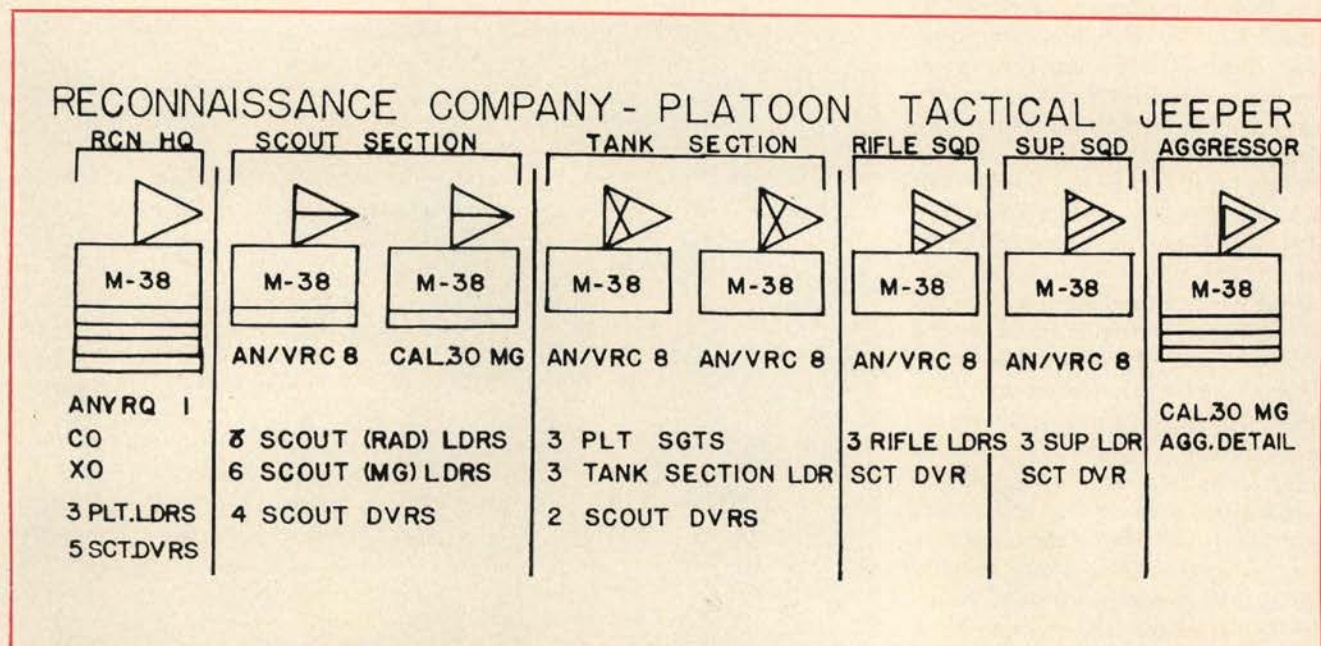
nate elements are emphasized. Basic combat skills are stressed throughout, including basic fire and maneuver, use of cover and concealment, hasty attack and defense battle drills, and reporting procedures. Enemy situations can be injected through the tape recorder or radio arrangement and spot reports which force the orders group to make decisions as to the hasty deployment of the unit. At the completion of each mission, new orders are issued presenting new situations.

### Jeeper Exercises

The second orders group training expedient falls under the general heading of jeeper exercises. The term jeeper covers a multitude of problem types, those which involve the use of an organization's wheeled vehicles in place of the heavier tracked vehicles in the conduct of leaders' training. We cannot count on extensive use of full-tracked armored vehicles in our training for two basic reasons. First, many posts and training areas have rigid restrictions on cross-country deployment to save ground maintenance funds. Secondly, the logistic support of an armored unit is expensive and the peacetime budget will not support unlimited maneuvers involving armored vehicles. The various types

of jeeper exercises permit the conduct of unlimited numbers of orders group or leaders' field problems allowing free cross-country maneuver without civil damage or appreciably draining class III supply sources. In the reconnaissance unit we have sufficient quarter-ton trucks mounting radios to make the jeeper exercise a simple and efficient expedient. There are several varieties of jeeper exercises which serve the needs of the reconnaissance orders group; the only limitation is in the ingenuity of each commander.

*The Tactical Jeep:* This is the most difficult of the jeeper exercises to organize and conduct. It is also the most effective training expedient. It requires leaders riding in flag-marked quarter-ton trucks to execute combat missions and formations as if they were, in effect, operating with their TO&E vehicles. The problem is set up with either verbally issued five-paragraph field orders or radio issued operations orders to leaders riding in quarter-ton trucks bearing various colored flags which denote the vehicle type (Example: Red flag on a quarter-ton truck identifies it as an M41 tank). Missions are *driven* through; route reconnaissance, spot, shell and after action reports submitted; battle drills executed; basic fire and maneu-



(Lt. Beckley)

Organization for Platoon Tactical Jeepers; ROCID Armored Cavalry Battalion: This chart shows schematically the use of the ROCID Reconnaissance Company's organic vehicles in the conduct of a Company operated Platoon Tactical Jeep. Any platoon of this type company may conduct its own Tactical Jeep by borrowing vehicles from Company Headquarters or the other two line platoons providing a 1/4-ton truck for each of its full tracked elements. NOTE: The rectangle marked M38 simulates the 1/4-ton truck; the triangle represents the flag denoting simulated squad or vehicle.



ver discipline adhered to; all these techniques are practiced on the ground. In effect, the only requirements not effectively covered in the exercise are squad level troop leading procedure and armored vehicle crew teamwork. The unit's organization for the tactical jeep exercise depends upon the commander's initiative. An example is shown on the preceding page of a reconnaissance platoon of the reconnaissance company organized for the platoon tactical jeep. A reconnaissance company tactical jeep exercise may be conducted by merely adopting the organization for the platoon tactical jeep of the separate reconnaissance platoon in each of the three line platoons in the reconnaissance company.

In the reorganization of the Army into more mobile striking forces, several new organizations have been effected in reconnaissance units. In the Infantry Division (ROCID) an Armored Cavalry Battalion, TO&E 17-85T dated 20 December 56, has been organized. The schematic diagram shown on the preceding page indicates one method of using the line company's organic vehicles to operate a Jeep exercise. The Armored Division has also changed its reconnaissance unit (ROCAD) TO&E 17-45T ROCAD, and has a different form of Armored Cavalry Battalion. The Armored Division Armored Cavalry Battalion line company, instead of having three combined arms teams or reconnaissance platoons, has a Scout Platoon, two Tank Platoons, an Armored Infantry Platoon and a Mortar Section. In the tactical employment of this scrambled organization the various elements are issued out, forming balanced or unbalanced combined arms teams as the enemy situation, mission and terrain require. They still have more than adequate quarter-ton trucks to effect the jeep exercise. However, in planning a jeep exercise the commander must make up his platoon or company order of battle for each problem. It will not be the same each time as is the case in the Infantry Division Reconnaissance unit. Under the new structure, the separate Tank and Armored Infantry Battalions have lost their Light Tanks and Infantry leaving only what in effect is a Scout Platoon; their problem of training is consequently reduced. The only or-

ganization that we have not covered is the Airborne Division (ROTAD) Reconnaissance Company which has recoilless rifles instead of tanks and is entirely jeep mounted which precludes the problems of full tracked mobility.

*Cross-country Map Exercise:* The first of these easily organized and conducted jeeps is nicknamed the *foxhunt*. It is actually a high speed mounted map reading exercise. The idea was taken from European road races conducted by automobile clubs. This problem is designed to develop the map reading capabilities of our subordinate leaders, enabling them to *think at a gallop*. Student leaders, mounted in quarter-ton trucks and armed with maps, are required to negotiate a 10 to 20 mile circular course laid out in such a manner as to deprive them of a recognizable road network. Checkpoints are placed at intervals along the course at positions difficult to locate and reach. Each jeep-mounted leader is timed around the course and between checkpoints. Radio-telephone procedure; route, bridge, ford and bypass reconnaissance; mine and demolitions training can be integrated through requirements placed on the leaders at the start of the course by the officer in

charge and subsequently throughout the remainder of the course by checkpoint attendants. It is possible, at each checkpoint, to operate a station involving techniques of reconnaissance requiring the leader to solve the station problem before moving on to the next checkpoint.

An innovation to the *foxhunt*, called the *blackout jeep*, makes use of modified maps in the conduct of the exercise. The unit modifies the maps by inking out all town names and route designations. This forces the leader to read his map by ground forms or terrain features and not, as so many do, by town names and route numbers. In all other aspects the exercise is identical to the *foxhunt*. Through this innovation, the leader develops an appreciation of terrain and a thorough understanding of map-ground relationship. It is best to select and modify one set of maps, using the same modified maps over and over again, saving maps.

Another variation of this type jeep is called the *mounted cross-country compass exercise* and is initiated to develop proficiency in the use of the compass. The problem is set up and conducted in the same manner as the other cross-country map exercises, substituting compass directions or azi-



(U. S. Army)

The *Blackout Jeep* Exercise makes use of modified maps in the conduct of the exercise. The maps are modified by inking out all towns and route designations. This forces the leader to read his map by ground forms or terrain features and not by the names of towns and route numbers.





(Lt. Beckley)

**The Terrain Ride Exercise:** This Jeep Exercise requires the commander to lay out problems on available terrain and "talk" his leaders through these problems step by step, bringing out through class participation, the techniques, battle drills and the actions of the various subordinate units.

muths for map instructions. It also may be set up in the form of a course laid out over a single azimuth which would train the leader in long range movement to an objective in an unmapped area. The latter is presented in the form of a tactical mission and conducted without maps. The idea of being forced to function without maps is a thought that brings horror to commanders, especially reconnaissance unit commanders. Realizing that a great portion of the earth's surface is unmapped, however, the possibility becomes one that we cannot overlook. In the African Campaigns of World War II, according to accounts of General Rommel, major units were forced to function in combat situations minus maps. Our reconnaissance leaders must never be totally dependent upon maps. They should be prepared to execute long range combat missions navigating by compass.

It is possible to incorporate the mounted cross-country compass exercise with the tactical jeep exercise by issuing only compass directions (No maps). The various tactical elements must successfully accomplish the combat mission maneuvering strictly by compass direction. This maneuver is extremely difficult to

perform and should not be attempted until the unit orders group has become a well organized efficient operating machine.

**Terrain Ride:** The terrain ride is an exercise by commanders who desire to personally review tactical employment and basic combat techniques with their subordinate leaders. This insures adherence to the unit SOP and standardization of thinking within the unit orders group. A relatively slow-moving exercise, characterized by class participation, it moves at a speed governed by the discretion of the commander. A tactical problem is written covering the missions desired. A ground reconnaissance is made to firm the problem in the commander's mind. During the ground reconnaissance the commander selects a series of vantage points from which to conduct the various phases of the problem. This allows for student observation of the problem area from commanding terrain. The exercise commences with the commander's initial order and subsequent movement to the first vantage point. From this vantage point the commander queries his subordinates as to ground locations of problem boundaries, phase lines and control points given verbally in the initial order. This is followed by

movement from vantage point to vantage point, a stop being made at each to cover in detail evaluation of terrain, choice of battle drill formations and employment of subordinate squads and sections. The exercise is terminated with a critique and review of the entire problem.

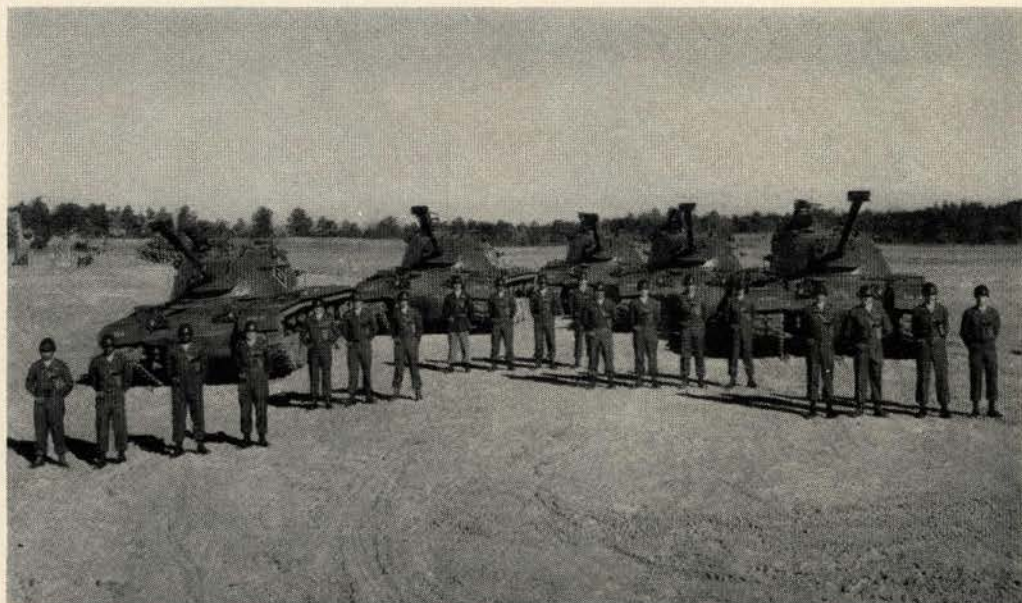
### Summary

In conclusion several points should be highlighted. First, the only limitation to the number of variations that may be applied in the conduct of jeeps or mappers is in the ingenuity of each commander. Secondly, the equipment requirements of any of these training expedients fall within any reconnaissance unit TO&E. Thirdly, and most important, any of these gimmicks may be conducted concurrently in addition to required training or training support commitments. No matter what the unit may be involved in, from conducting basic training to providing troop requirements for reserve summer training, these training expedients may be conducted simultaneously. This means that even the most garrison-bound, least combat ready reconnaissance unit may still strive effectively towards efficient orders group operation. The basis for this orders group training lies in the maximum utilization of quarter-ton trucks as an in-lieu-of item for the heavier full tracked vehicles the use of which will be restricted by both the peacetime economy and probability of claims damage. By using only quarter-ton trucks the possibility of obtaining off-post maneuver areas increases. This allows for terrain selection in conjunction with field training. The equipment requirements of mapper exercises are equally simple to meet. Once the layout has been set up and equipment requirements met, the class may be repeated as often as needed with little pre-class preparation. The end result is simply teamwork training. We can still have the capability of efficient orders group operation. The success or failure of the reconnaissance unit in the performance of its missions depends upon a smooth working, thoroughly oriented orders group that can move, shoot and communicate at a gallop. This we can accomplish if we do nothing more than utilize gimmicks such as the jeeps and mappers outlined and a little ingenuity.



Platoon Leader  
2d Lt. Gary L. Clark

Platoon Sergeant  
M Sgt John A. Carlson



1st Platoon, Company B, 2d Tank Battalion, 33d Armor

(U. S. Army)

## Report of the 1957

# ARMOR LEADERSHIP AWARD

By CAPTAIN JOSEPH A. PATTI

*This award is presented to the outstanding  
tank platoon of the division holding the competition*

**F**ORT Polk, Louisiana, was the scene of the 1957 Armor leadership award competition. Honored as the "Draper" division was the 1st Armored Division, commanded by Major General Edward G. Farrand. During the period 19-27 November, five selected platoons, handicapped by adverse weather conditions, vied for this highly coveted trophy in tests of individual and unit proficiency and endurance.

The Armor Leadership Award is presented to the outstanding tank

platoon of the division holding the competition. The Commanding General, Continental Army Command, designates a different armored division each year to hold the award competition. The winning platoon receives the distinguished rotating trophy, valued at \$3,750, with suitable individual trophies for the members of the platoon.

### Plans

Upon notification of being selected to conduct the Armor leadership competition for 1957, the Commanding General, 1st Armored Division, appointed a board of officers to determine the policies and procedures for the conduct of the competition. The board outlined in detail the selection criteria, the events to be judged and the manner in which they would be scored. The scope of the competition

covered all aspects of training from physical fitness to simulated combat.

### Resume of the Competition

Three days prior to the test the platoon leaders and the platoon sergeants were oriented on the conduct of the test and introduced to their test company commanders and umpires. The method of control and means used to introduce situations were explained.

Each platoon received an orientation at 1000 hours the day before being committed to the test. This orientation furnished the participants some background on the Armor Leadership Award and ironed out last minute details.

The decision to test each platoon within a two-day period and complete the tests for all platoons within six

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**CAPTAIN JOSEPH A. PATTI**, Armor, enlisted in 1939. Serving in the Pacific during World War II, he received a battlefield commission. After a Stateside tour he was sent to Austria where he worked with Military Intelligence. After a tour with the 11th ACR at Camp Carson he went to Korea in 1953. Returning home in 1955, he was assigned to his present position, Assistant G3, 1st Armored Division; Fort Polk, Louisiana.



days required close coordination and timing. The committees responsible for each event had to be thoroughly versed and all foreseeable breakdowns were anticipated to insure uninterrupted flow of the competition. As examples, daily reconnaissance was made of all bridge crossings; an engineer company was on standby alert to repair all roads damaged in the Tactical Phase, Individual Tank Course and Tank Infantry Combat Course; also, on-site engineer support was required at the Individual Tank Course to insure operation of the aerial and moving targets.

To set the stage each day for the tactical phase and add realism, an Aggressor Team consisting of a light tank platoon (M41) and one scout section plus one scout squad was used to oppose the tested platoon. A demolitions team of one officer and 16 EM daily emplaced 300 lbs. of demolition, 100 gun flash simulators, smoke pots and the atomic blast simulator to portray friendly and enemy fires. The final setting was the forward observer team and six fire marking teams with flare guns and artillery simulators, flash and sound.

With the stage set the platoon was confronted with the following situations during the advance and flank guard missions:

1. Breeching a minefield with the aid of Infantry.
2. Reduction of a road block.
3. Seizure of a bridge in a defile which air reconnaissance reports intact. (The bridge is subsequently blown during the platoon's dash to secure it; and the platoon is required to execute a withdrawal.)
4. Passage through overhead artillery fire.
5. Actions during an air attack, platoon leader's tank is disabled, requiring him to change tanks.
6. Preparation for an atomic blast. (Atomic simulators were used.)
7. Reduction of enemy delaying position, requiring an attack be made from the march column.
8. Establishment of a blocking position.

#### Weather

The scheduled date for initiation

of the competitions, 18 November, was ushered in by heavy rains which necessitated delaying the competition. Competition, however, commenced 19 November and continued through 21 November when heavy rains accompanied by ground fog again necessitated suspension until the period 22-24 November. Competition was resumed 25 November and was completed on 27 November. All platoons were hindered during the tactical phase of the competition by poor trafficability resulting from the heavy rain.

#### Scoring

To select the outstanding tank platoon from the five top tank platoons of the Division, the scoring and control of each platoon had to remain constant and the human element removed wherever possible. To achieve this standardization of scoring, control and round the clock operation, it was emphasized that the same personnel must be used daily to score and control the same event for each platoon. To further insure this, two test control groups were organized for the conduct of the Tactical Phase. Each group consisted of a test control team of one officer and one NCO and an umpire team of one officer and five NCO's. The test control officer insured uninterrupted conduct of the phase and acted in the capacity of company commander for issuance of orders to the platoon leader and furnishing necessary guidance. The umpire team introduced situations into the problem and scored each platoon on its actions and responses. To maintain this consistency in the scoring of all events, one group accompanied each platoon 1400-0200 hours daily and the other group 0200-1400 hours daily. A combination scenario and check sheet was utilized by the umpires. The scenario gave detailed information of the tactical situation so that each platoon received the same guidance throughout the problem. The check sheet portion was objective in form in that it left little room for opinionated responses by the scorers; a platoon either responded to a given situation or did not respond and was graded accordingly.

Scorers and inspectors for the other events were rehearsed several times to insure uniform grading throughout the competition and to eliminate the

familiar readjustments usually made after the first platoon has been tested.

#### Support

Normal company logistical support was provided by two company test command post groups. These test command post groups were alternated daily so that one group accompanied each platoon throughout the tactical phase. They each consisted of an infantry squad which was available to the platoon leader when requested, a signal monitor team for recording all messages from the platoons, a recovery section for clearing the impact area prior to firing live ammunition, maintenance personnel, both track and radio, from the company maintenance section of the test platoon, and a tank-type gas truck.

Commendable is the fact that of the 25 tanks which started in the competition, all 25 tanks finished and participated in the post-operational inspection. This is not to imply there were not breakdowns or tanks stuck; one individual tank was stuck four times. The credit goes largely to the company maintenance sections and the recovery teams whose missions were to keep the tested platoon rolling.

#### Conclusions

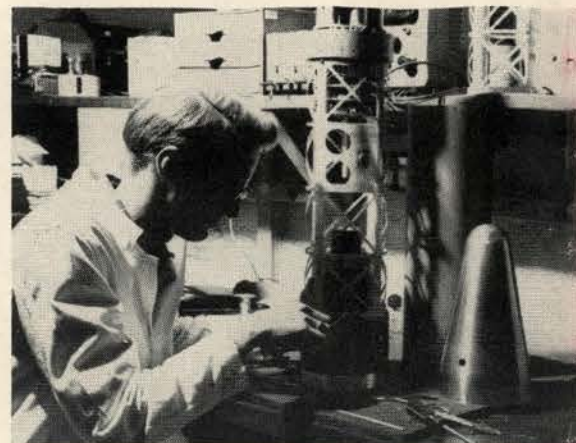
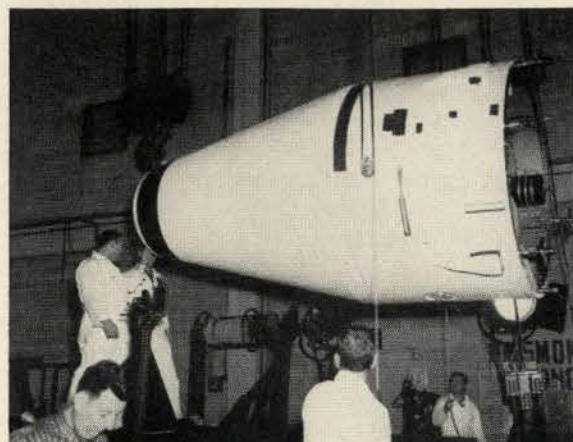
The designation of a unit as a "Draper" division generates an enthusiasm and a keen competitive spirit in training during the period leading up to the selection of the competing platoons which has the added effect of increasing the effectiveness and the combat readiness of all the tank platoons within the division. The competition points up the importance of the role of the small unit and its commander. It further supports the thesis that the effective fighting strength of an armored division is directly proportionate to the state of readiness of its platoons.

In order to arrive at a fair and impartial method of selecting the outstanding platoon, it is necessary to standardize the control, umpiring and scoring, and to keep the rules for exceptions to absolute zero.

The 1st Armored Division has benefited from the lessons learned from the 1957 competition. It is also proud of its winners. Good luck and best wishes are extended to the division selected to hold the 1958 Armor Leadership Award competition.



Nose section of JUPITER-C contains some of the most precise and delicate instrumentation ever devised.



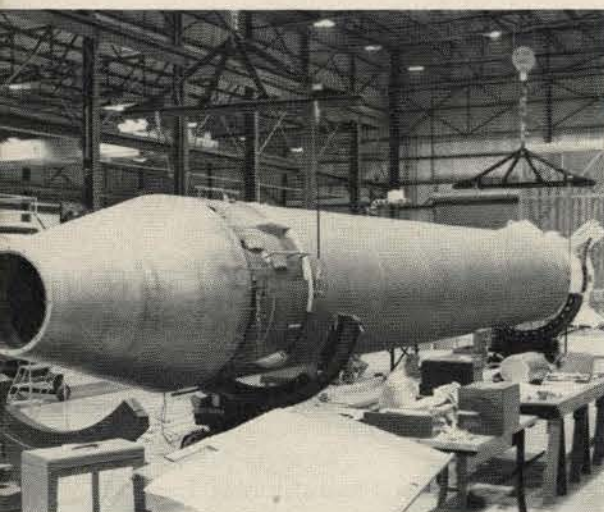
Interior instruments of the satellite launched by the U. S. Army are placed in a fiberglass "lattice sleeve."

## A SATELLITE IS BORN

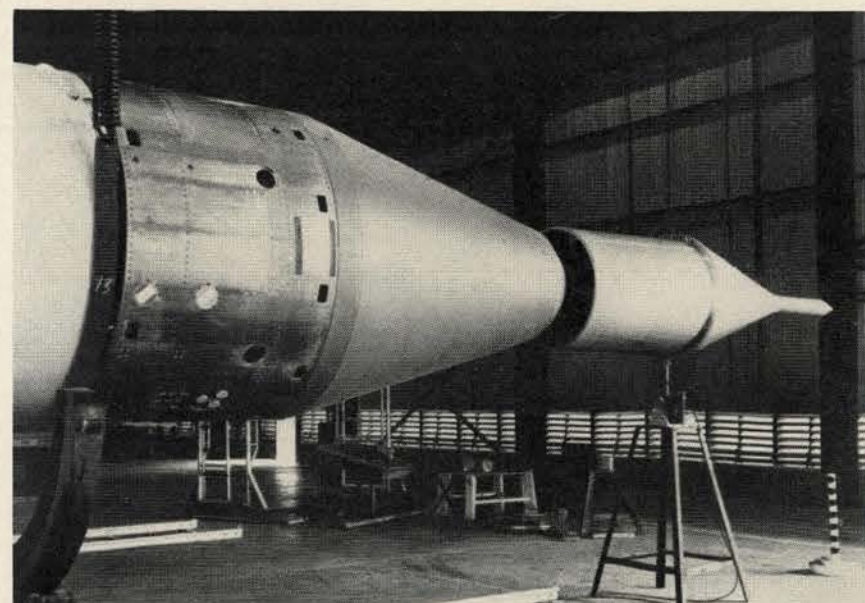
All Photographs U. S. Army



The main stage booster being prepared for checkout.

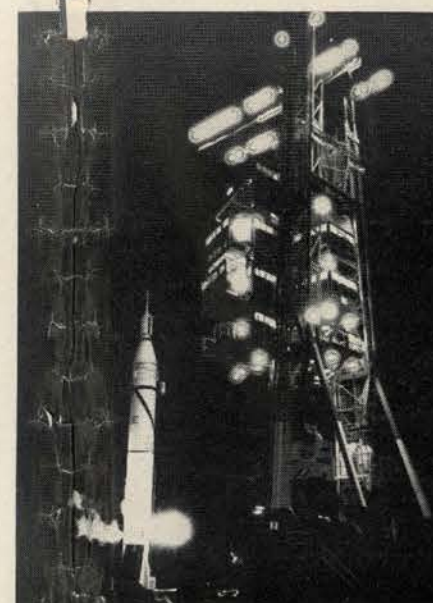


Main stage booster and nose section now are mated.



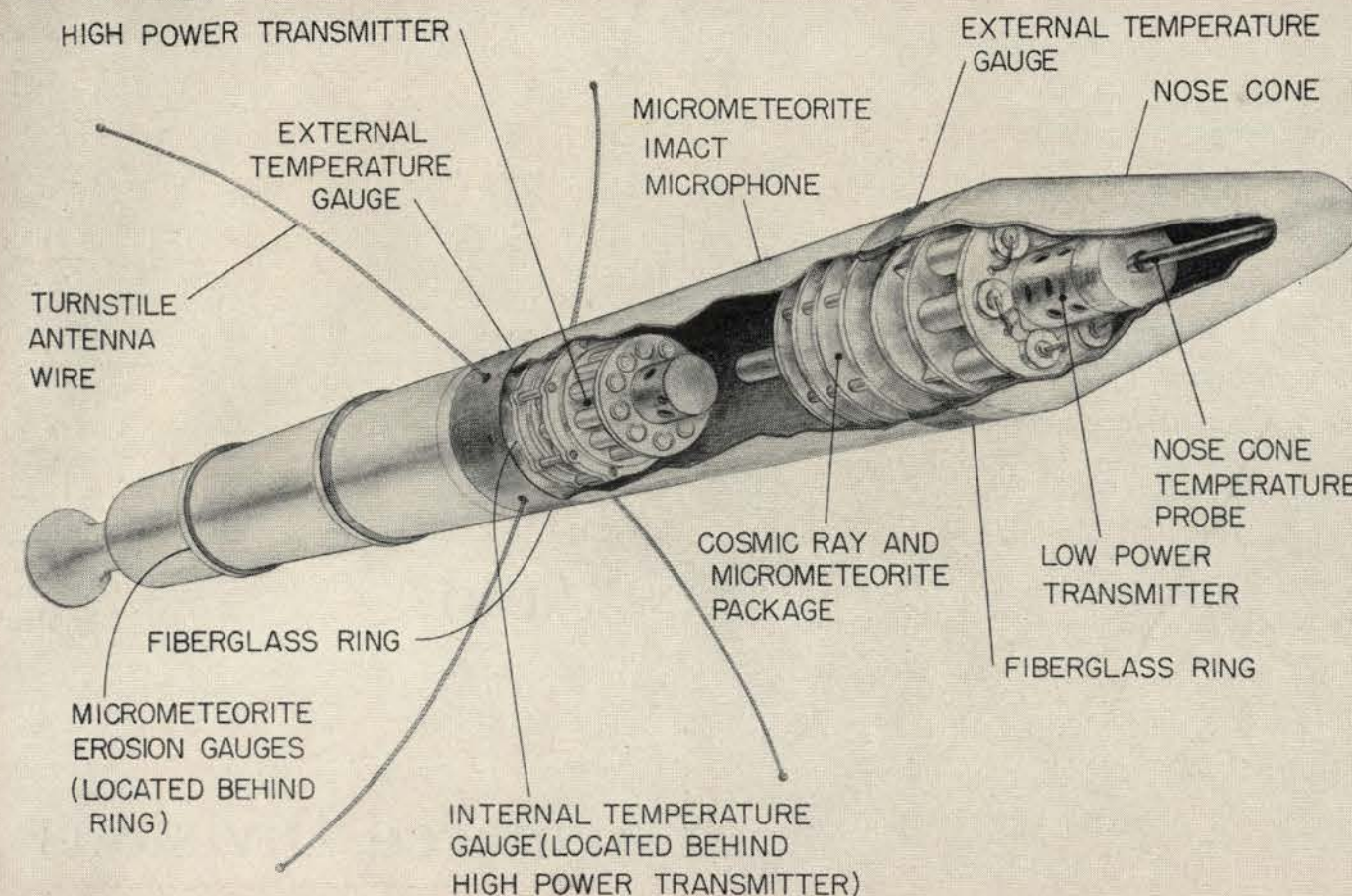
High speed assembly of satellite vehicle joined to nose of main stage rocket.

ARMOR—March-April, 1958



The JUPITER-C now ready for launching.

ARMOR—March-April, 1958



Artist's conception relating to interior instrumentation of U. S. Army earth satellite. The scientific earth satellite put into orbit by the U. S. Army is 80 inches long and weighs 30.80 pounds. The instrument-carrying section (forward) and the final-stage rocket (rear) orbit as a single unit. Fanning out from the mid section is the antenna, made up of whip-like rods with weighted balls on the ends of the rods. The rotational spin of the satellite forces the antenna out from the satellite. Both the high-power transmitter (radiating 60 miliwatts of radio frequency power) and the low-power transmitter (radiating between 10 and 20 miliwatts of power) transmit information continuously on eight channels to ground stations.



The Army's JUPITER-C carrying the free world's first satellite blasts off on its history making flight.



*Part I of this series covered the British and Russian Armored Divisions. Part II traces the early growth and development of the German Panzer and the American Armored Divisions.*

# The STRUCTURE and FUNCTIONS of Armored Divisions

By RICHARD M. OGORKIEWICZ

**P**ART One of this series of articles described the development of the armored divisions in the British and Soviet Armies. The former had pioneered the organization and mobile employment of armor but, largely through the persistence of hidebound limited role theories, on several occasions has failed to give its armored divisions full scope and to make full use of their capabilities. A striking instance of this is the official British attitude toward armor during the past two years, also the recent reductions and restrictions imposed upon British armored units.

The Soviet Army, on the other hand, having failed to make proper use of its armor in the early stages of World War II, has learned its

lesson and has consistently placed great emphasis on its armored forces. Since World War II armored forces have been considerably expanded in relation to the rest of the Soviet Army and have become a most important element of the Soviet military and political strength.

In many ways, what the Russians have done during and since World War II is an extension of the principles and the importance of armor established by the German *Panzerwaffe*. It is appropriate, therefore, to examine next the development of the German armored divisions.

## German

The development of the German armored, or Panzer, divisions began in October 1935, when the first three divisions were activated. This event was, however, preceded by smaller scale experiments and an improvised Panzer division used in the summer maneuvers of that year.

The organization of the original

Panzer divisions was built around a tank brigade of two tank regiments, each with two battalions, with a nominal total of 16 tank companies, or 561 tanks per division. This represented a very powerful tank component and reflected in part the influence of the contemporary British theories with their emphasis on tank brigades within the framework of armored forces, often to the exclusion of everything else.

However, this last extreme of "all-tank" ideas was never accepted by the German *Panzerwaffe*, due largely to the wisdom of its leader, General Guderian. In contrast to the contemporary British theories and the British and Soviet practice, the Panzer divisions were from the start a combined arms team and they became versatile fighting formations—the mobile spearhead of the German Army and not merely a limited-role arm of exploitation and pursuit.

Thus, the original Panzer divisions each had a motorized infantry bri-

RICHARD M. OGORKIEWICZ, author of this series, presently a consulting engineer and lecturer at the Imperial College of Science, London University, graduated from that institution in 1946. Prior to his present employment he held positions with Ford Motor Corp. and Humber Ltd.



gade, consisting of a two-battalion truck-borne infantry regiment and a motorcycle rifle battalion, to complement its tank brigade. It also had an artillery regiment with 24 105mm howitzers, an antitank battalion with towed 37mm guns, a reconnaissance battalion of motorcyclists and armored cars, an engineer company—rapidly expanded into a battalion—and the usual divisional service units.

The original 1935 organization of the Panzer divisions was widely assumed, outside Germany, to have remained unaltered until after the 1940 French campaign. In fact, however, several major changes took place even before the outbreak of World War II.

One of the first major changes was an increase in the infantry strength. Peacetime maneuvers showed that three rifle battalions per division were not enough and, therefore, it was decided to add a fourth. Then, on mobilization, each tank battalion was reorganized on the basis of one medium and two light tank companies, the fourth company of each battalion becoming a depot and replacement unit. As a result, each Panzer division had an actual strength of between 270 and 320 tanks and the proportion of tanks to infantry became 12 tank companies to 12 rifle companies instead of the original ratio of 16 to 9.

The modified organization held good for the six Panzer divisions which were raised by the outbreak of World War II, in September 1939, and for the six out of the ten Panzer divisions used in the 1940 French campaign. The other four Panzer di-

visions used there differed in their organization and, what is more, also in their origin from the original six raised under the aegis of the Inspectorate of Motorized Troops. They were the outcome of an independent development initiated by the German cavalry and started in 1937 with the creation of the 1st Light Brigade—a mobile formation intended for the classic cavalry role of strategic reconnaissance and security. A year later the brigade was expanded into a light division and three more such divisions were simultaneously created.

In essence the light division was a motorized infantry formation with four rifle battalions and one, or two, light tank battalions; artillery and other units of the division were similar to those of the Panzer division. The chief characteristic of the light division was its strategic mobility, there being organic tank transporters for all of its tanks, for instance, and in keeping with its defensive screening role its rifle companies possessed twice the normal allocation of machine guns.

In 1938 the light divisions passed from the control of the cavalry and together with the Panzer divisions came under the newly formed Inspectorate of Mobile Troops under Guderian. But they retained their identity until after the 1939 Polish campaign. At this time they were renamed Panzer divisions and they reorganized to some extent. In the main, the reorganization was confined to increasing the tank strength to a regiment with three, or, in the case

of one division, two tank battalions.

Altogether, on the eve of the 1940 French campaign, there were 35 tank battalions in the ten Panzer divisions with a total of 2,574 tanks. This was no more than the total French front line tank strength but the bold and concentrated employment of the Panzer divisions, grouped in Panzer corps, proved decisive.

After the French campaign, which firmly established armored divisions as the decisive element in ground warfare, a further reorganization and expansion of the Panzer forces took place. The number of Panzer divisions was doubled, but at the expense of the number of tank units per division. At the same time the strength of the organic infantry was increased still further, partly to make up for the reduction in the number of tank units and partly to satisfy the usual demands for more infantry.

The reorganized 1941 Panzer division thus had only one tank regiment, with three tank battalions in the case of six divisions and only two tank battalions in the case of the other 14 divisions. On the other hand, the organic motorized infantry brigades now had two two-battalion rifle regiments and one motorcycle rifle battalion; other changes included the addition of a third, medium artillery battalion with 150mm howitzers and 105mm guns, and of an antiaircraft battalion.

The reorganization of 1940-41 reduced seriously the strength and proportion of tanks in the Panzer divisions. Each division now had only

(U. S. Army)



German armored troops in Poland, 1939



German  
Tiger tank  
mounting 128mm gun



(U. S. Army)

200 or 150 tanks and only 9 or 6 tank companies to 15 rifle companies, that is, there was a complete reversal of the original ratio. This was strongly criticized by the leading Panzer commanders who deplored the reduction in the tank strength of the individual divisions and considered it inadequate in relation to the infantry strength. However, in view of the low rate of German tank production at the time, there was little that could be done about it. The Germans had only 46 tank battalions in their 20 Panzer divisions on the eve of the 1941 Russian campaign. Nevertheless, with 17 Panzer divisions concentrated in four Panzer groups, or armies, they came close to defeating the Soviet Army.

The Russian campaign of 1941 took a heavy toll of the Panzer divisions and affected seriously their strength which began to be governed by losses and the availability of replacements as much as by their tables of organization.

Thus, in preparation for the summer offensive of 1942, Panzer divisions in the Southern Sector of the Eastern Front, where the main German effort was concentrated, were re-equipped with three tank battalions each. But those in the Central and Northern Sectors received practically no replacements and as a rule had only one, sometimes two, weak tank battalions. In consequence, although the total number of Panzer divisions was increased further, to 25, their effective strength varied considerably.

During 1942 several other changes also took place. The organic infantry was reduced, for instance, with the disappearance of the motorcycle rifle battalion amalgamated with the reconnaissance battalion. The infantry brigade headquarters also disappeared,

like the superfluous tank brigade headquarters had done two years earlier, and the two rifle regiments were placed directly under divisional control, like the tank regiment. At about the same time a small nominal increase took place in the strength of the tank battalions, the number of tank companies per battalion being increased from three to the original pre-war figure of four. However, this increase in the number of tank companies was neither immediately carried out nor generally maintained.

In 1943, following the heavy losses of yet another winter campaign and the return of Guderian to the scene as Inspector of Armored Troops, another reorganization was contemplated. The losses in the Stalingrad operations of the period were staggering, in February 1943 amounting to 1,596 tanks or more than any other month of the war. Tank production was, however, rising above the totally unrealistic level of the early war years and in 1943 was almost double that of 1941.

Partly on the strength of the rising production figures and partly due to Guderian's firm conviction of the need to strengthen the tank core of the individual Panzer divisions, the main change which was contemplated was an expansion of the tank regiment of each division to four battalions. One of these was to be temporarily equipped with the turretless assault guns which on the Russian plains were almost as good as turreted vehicles. Another was to be equipped with Tiger heavy gun tanks to increase still further the striking power of the divisions.

In addition to tanks, a much more generous allocation of armored personnel carriers was also contemplated

as was the use of self-propelled guns by the divisional artillery, the first few self-propelled 105 and 150mm howitzers having appeared toward the end of 1942.

However, in spite of the rising production, few of the proposed changes were put into effect. As a rule, from 1943 on, Panzer divisions had no more than two medium tank battalions and only one of the four rifle battalions equipped with armored carriers. Similarly, only one of the three artillery battalions was self-propelled. In the summer of 1944 this was recognized as the official establishment and it may be taken as the "average" composition of the Army Panzer divisions during the latter part of World War II.

There were, of course, exceptions to the rule. In 1943 some divisions still had three tank battalions, including a Tiger heavy tank battalion, and in 1944 the "elite" *Grossdeutschland* Division even had four, also including a Tiger battalion. On the other hand, on the eve of the Allied landings in Normandy in 1944, the *Panzer Lehr* Division had all four of its rifle battalions and its combat engineer battalion mounted in armored personnel carriers and the whole of its artillery self-propelled. But even this favored division had only two tank battalions, one of Panthers and one of Pz.-Kpfw.IVs, with a total of some 190 tanks. Other divisions were similarly equipped with one Panther and one Pz.Kpfw.IV battalions but their total tank strength was seldom more than 170 tanks.

Another exception to the rule was the Panzer divisions formed by the conversion of Panzer Grenadier divisions, as was the case with the *Waffen-SS* Panzer divisions. At their



peak, in 1944, there were eight of these SS Panzer divisions against 25 Army Panzer divisions.

Panzer Grenadier divisions themselves started life as motorized infantry divisions and, just as the light divisions represented the contribution of the cavalry to the motorization and mechanization of the German Army, they represented the contribution of the infantry.

The original pre-World War II motorized infantry division was a conventional three-infantry-regiment, or nine-rifle-battalion, formation which had simply exchanged its horse traction—retained by regular German and Soviet infantry divisions throughout World War II—for motor transport. After the 1939 Polish campaign the motorized division was adjudged too heavy for its mobile follow-up role and one of the three infantry regiments was replaced by a motorcycle rifle battalion. In 1942 the motorcycle battalions disappeared but in that year the divisions on the Southern Sector of the Eastern Front received for the first time an organic tank battalion apiece.

In the following year this was extended to all divisions of this type, although some received an assault gun battalion in place of the tank battalion. In June 1943 they were also officially re-named Panzer Gren-

adier divisions, the Panzer Grenadier designation having been applied already to the infantry units organic to Panzer divisions. At about the same time all the Panzer Grenadier regiments passed from the control of the infantry to the Inspectorate of Armored Troops but this did not prevent Guderian, the then Inspector, from deploring the diversion of tanks from the Panzer divisions proper to the Panzer Grenadier divisions!

A further diversion occurred later in the same year on the creation of the first SS Panzer divisions. Up till then the *Waffen-SS*, which had originated with the Storm Troops of the National Socialist Party, had contented themselves with motorized infantry formations. But in 1943 the first SS Panzer divisions were created by the transformation of some of the existing SS Panzer Grenadier divisions. In principle their organization was the same as that of the Army Panzer divisions but they retained three-battalion Panzer Grenadier regiments.

The existence of these divisions with six rifle battalions each and the fact the Army Panzer divisions often had only one tank battalion and were thus no better off than Panzer Grenadier divisions, resulted in demands for three-battalion infantry regiments for the Panzer divisions also. Gener-

ally, however, the four Panzer Grenadier battalions per division were considered adequate and the Panzer commanders who looked beyond the more immediate needs and problems emphasized the importance of increasing the tank strength of the Panzer divisions rather than their infantry. Their principal aim throughout World War II was to expand the Panzer regiment of each division to four tank battalions.

During the latter part of World War II the tank strength of the Panzer divisions was plainly inadequate. Not only were there no more than two tank battalions to four rifle battalions but the actual tank strength in the field was even lower.

The inadequate tank strength was a severe handicap to effective tactical employment of the Panzer divisions which was further hampered by shortages of armored personnel carriers and self-propelled guns. As a result, because the major portion of their infantry was carried in unprotected wheeled vehicles, the formation of closely knit tank-infantry teams was difficult, even when sufficient tanks were available. The Panzer divisions could not, therefore, develop fully their system of mixed battle groups, or *kampfgruppen*, which they pioneered and which gave them such a tremendous initial advantage

Armored half-track troop carriers unloading Panzer Grenadiers



(Associated Press)



over their quite surprised opponents.

Nevertheless, in spite of all the difficulties, the Panzer divisions retained right up to the end of World War II their pre-eminent position as versatile fighting formations which combined maximum striking power with mobility. Just as they formed the spearhead of the German offensives in the early part of World War II, so, when the tide turned, they formed the core of the German defense and distinguished themselves in mobile defense as well as numerous counter offensives.

In the light of this it was natural that the new German Army should attach great importance to its new Panzer divisions. A total of six has been planned, each based on three tank and three armored infantry, or Panzer Grenadier, battalions. The sound, equal proportions of tanks and armored infantry and the emphasis placed on the development of armored cross-country personnel carriers show that the earlier hard-earned experience has not been forgotten. At the same time, the organization of the new Panzer divisions based on self-contained battalions and incorporating three combat command tactical headquarters shows that the Germans have brought the structure of their armored divisions in line with currently accepted ideas.

### American

Just as the new German Panzer divisions show signs of American influence, so the early organization of American armored divisions was influenced by that of the Panzers which were then leading. However, the initial impetus came from Britain for it was as a direct result of the British experiments with the Mechanized Force of 1927 that the first American Mechanized Force was assembled, in 1928, at Fort Meade, Maryland.

This first, mixed, brigade-size force lasted barely three months. But a second, smaller Mechanized Force set up two years later, in 1930, at Fort Eustis, Virginia, did much better and on disbandment in 1932 a part of it became the nucleus of the mechanized cavalry unit organized at Fort Knox, Kentucky, and soon afterwards absorbed into the 1st Cavalry Regiment, Mechanized.

From this there gradually grew the 7th Cavalry Brigade (Mech), which

was called into being in 1932 but which did not become effective until the late thirties. By 1939, however, the brigade was complete: it consisted of two mechanized cavalry regiments, which were, in effect, light tank battalions, with a total of 112 light tanks (or "combat cars," as they were then called) and a small motorized artillery regiment with towed 75mm howitzers.

The role originally envisaged for the brigade was a mechanized form of the traditional and limited cavalry role of exploitation, raids on enemy flanks and rear and so on. This narrow outlook, common to most of the early armored forces, did not, fortunately, remain in force for long, particularly under the impact of the successes scored by the German Panzer divisions. The decisive role played by the latter in France in 1940 showed convincingly the value of armor as the spearhead of modern armies and the French campaign was barely over when the American Armored Force was created. It was visualized by its founders as the decisive arm in ground warfare and its principal elements were to be armored divisions—versatile fighting formations made up of all arms, like the Panzer divisions.

Some steps toward the organization of armored divisions had already been taken before the creation of the Armored Force. During the 1940 spring maneuvers in Louisiana the expanded 7th Cavalry Brigade had attached to it a motorized infantry regiment and although several shortcomings were found in this first combination of tanks with motorized infantry it formed an acceptable basis for an armored division. And it became one when the

first two American armored divisions were activated, in July 1940, the 7th Cavalry Brigade becoming the 1st Armored Brigade of the 1st Armored Division.

As originally organized, the armored divisions consisted of a reconnaissance battalion, an armored brigade, a two-battalion infantry regiment, an artillery battalion with 105mm howitzers, an engineer battalion and service units. The armored brigade itself, which was the main element of the division, consisted of two light tank regiments, each with three M3 light tank battalions, one medium regiment with two battalions of M3 medium tanks and one artillery regiment with two battalions of 105mm self-propelled howitzers. Altogether the division had 108 medium tanks and 273 light tanks.

Basically, the organization of the original American armored division with its armored brigade and a supporting infantry regiment was similar to that established earlier by the German Panzer divisions. The influence of the latter was natural but the American armored divisions also showed several original features, as well as the influence of the earlier mechanized cavalry brigade organization, and thereafter evolved along increasingly independent and original lines.

The original divisional organization was tried during the 1941 maneuvers and—not unexpectedly for a first attempt—a number of defects were noted. The chief defect was a lack of balance between the number of tank units and other arms: there were no less than 25 tank companies and only



Cavalry  
Combat Car

(U. S. Army)



The M3  
Light tank



(U. S. Army)

7 rifle companies, showing clearly the underestimate of the importance of the infantry component so common to the early armored forces. There was also overlapping of responsibility between the divisional and armored brigade headquarters—again found elsewhere, in the early Panzer division. In consequence, the organization of the American armored division was remodelled to give it better balance, greater flexibility and greater striking power.

The reorganized division consisted of a reconnaissance battalion, two armored regiments, each with one light and two medium tank battalions, one armored infantry regiment with three battalions, three self-propelled 105mm howitzer battalions and, as before, one engineer battalion and service units. In general, the organization was tidier and the effectiveness of the division greater. The total number of tanks was reduced slightly, from 381 to 375, but the number of medium tanks was actually doubled and the division gained in most other respects also.

The most significant and novel feature of the new 1942-type divisional organization was the introduction of the two combat command tactical headquarters capable of assuming command of any combination of the division's units. This and the system of organizing combined-arms' tactical teams bestowed upon American armored divisions a remarkable degree of flexibility and effectiveness. Added to this was the fact that these armored divisions were the first to have the whole of their artillery self-propelled and the first to have the whole

of their infantry mounted in armored half-track carriers, all of which combined to give American armored divisions a considerable lead over the armored divisions of other armies which were neither so equipped nor so organized.

The introduction of the combat command system has been credited to General Chaffee, the father of the Armored Force. In all fairness, however, something similar began to be practiced a little earlier by the German Panzer divisions in the form of their mixed battle-groups, or *kampfgruppen*. Its origins could be traced back even further, to the older system of splitting German divisions into march-combat groups and the German emphasis on the tactical self-sufficiency of small units. But although the Germans may have anticipated some of the features of the combat command system they never carried it to its logical conclusion and did not base their divisional organization on it until well after World War II.

Admirable as it was, the 1942 combat command system was capable of improvement, as was the organization of the contemporary armored divisions. Changes in both came in 1943, as part of a general reorganization of the Army Ground Forces.

The atmosphere in which the reorganization took place could hardly be described as favorable to the armored divisions. The Armored Force had by then lost a good deal of ground and the decisive role originally envisaged for it was played down. At the same time control passed into the hands of men with less vision and less understanding of the value of armored di-

visions. Their narrow outlook was epitomized by the then commander of the Army Ground Forces who stated that armored divisions were "of value only in pursuit and exploitation."

In the circumstances, it is hardly surprising that the overall effect of the 1943 reorganization was to restrict the scope of the armored divisions and to shift, once more, the major portion of the tank strength of the American Army to infantry support. Armored divisions themselves were tied more closely to infantry by a new corps organization of two infantry and one armored divisions.

Apart from the lack of understanding of the full potentialities of armored divisions as versatile fighting formations there were also other factors. There was, for instance, a desire to economize at the expense of the armored divisions, which were admittedly more expensive than infantry divisions, and one of the periodic, almost world-wide waves of exaggerating the importance of antitank weapons. There were also the changes in the organization of the German Panzer divisions which reduced the proportion of tanks to infantry in them and which were wrongly interpreted—in Britain as well as in the United States—as a major combat lesson and not, as they were in fact, the result of inadequate tank production!

Lastly there were the shortcomings of the existing divisional organization which was still considered somewhat unwieldy and having too many headquarters. The situation was not as bad as in the early Panzer divisions where there were as many as five brigade and regimental headquarters to control seven tank and infantry battalions, but the three regimental headquarters of the 1942 American armored divisions were considered largely superfluous.

The outcome of all this was a new organization issued in September 1943, which eliminated the regimental headquarters and which also brought in other changes and reductions. The armored division now had a third but smaller combat command and three battalions each of medium tanks, armored infantry and 105mm SP howitzers, in addition to the reconnaissance and engineer battalions and service units.



(U. S. Army)



M48  
Medium tank

The main reduction was in the number of tank battalions, from six in the 1942 organization to only three in that of 1943. However, two of the three eliminated battalions were light tank battalions, whose equipment was of doubtful combat value; so effectively the loss amounted to one medium tank battalion. Most of the other reductions affected the "fat" so that, in the end, the armored divisions came through the ordeal looking leaner but not much less powerful.

In general, the new 1943 organization was only a further development of the system introduced in 1942. By eliminating the regimental echelon, by making battalions self-contained basic units and by giving even more emphasis to the combat command system the organization was made even more elastic and adaptable. So much so that the 1943-type organization has since been described as a federation of thirteen battalions!

It was with this organization that 14 out of the 16 American armored divisions fought in Europe in 1944 and 1945. The two exceptions were the 2d and 3d Armored Divisions which retained a modified form of the 1942 organization and consequently were called "heavy divisions."

Having proved itself in battle, the divisional organization based on combat commands and separate self-contained battalions was retained after the war. The basic 1943-type organization was, however, modified, the principal post-World War II changes being the addition of a fourth tank battalion and of a fourth armored in-

fantry battalion, and of a battalion each of medium and antiaircraft artillery; in addition the three combat command headquarters were placed on an equal footing.

The overall effect of the post-World War II organization, introduced in 1947 and retained, with modification, to date, was a return to something like the 1942 level in effectives. The total number of tanks, for instance, rose again, from 248 of the 1943-45 division to 361. This, combined with changes in equipment, increased considerably the striking power of the armored divisions.

Unfortunately, the post-World War II changes also brought with them increased complexity and further additions to the already formidable logistical problems. These facts and the universal trend toward smaller, more compact divisions make it

necessary to consider the problem of reducing the overall size of the armored divisions.

Within the present system of combat commands and self-contained battalions something can be done by reducing the number of tank and infantry battalions from four to three, replacing the light howitzers by a smaller number of larger caliber units, and proportional reductions in the size of other units. Beyond that any reduction in the overall size of the division, while retaining the existing type structure, would inevitably involve reductions in the size of the individual battalions.

An alternative to the latter course would be to abandon the system of combat commands and self-contained but homogeneous battalions for one of mixed, or integrated, battalions directly under divisional control. Something of a precedent for this already exists in the armored cavalry regiments with their mixed battalions. The adoption of an organization based on mixed battalions in armored divisions would mean some loss of flexibility at divisional level, but on the other hand, it would increase the effectiveness of its constituent units. Moreover, it would be in keeping with the demand for far greater tactical and administrative self-sufficiency on the part of the battalions in the dispersed mobile operations envisaged for the future. This, more than anything else, would argue in favor of integrated tank-infantry armored battalions, or small integrated regiments, which would, in addition, make possible a greater number of smaller but more mobile armored divisions.

(U. S. Army)



M59  
Armored  
Personnel Carrier



*Submitted herewith to the membership  
is the annual report covering the general affairs  
of the Association for the calendar year 1957*

# *The* **ANNUAL REPORT** *of the* **Secretary-Treasurer-Editor**

## *The Association*

The year 1957 continued to be favorable to Armor within the military field. In consonance with this theme the Association had an excellent year. January saw the new companion piece to *ARMOR* in its initial publication effort—*THE UNITED STATES ARMOR ASSOCIATION NEWS-LETTER*.

The 68th Annual Meeting was held at Fort Knox during the period 4-5 April. Despite inclement weather, which covered the entire Eastern half of the United States, attendance by off-post personnel was not far below our previous high of the preceding year. General Willard G. Wyman, Commanding General, CONARC, gave the principal address. He also was elected to succeed General Williston B. Palmer as our Association President. During the business sessions one amendment to the constitution was passed. The size of the Executive Council was increased from 18 to 24 members. In lieu of this change, the new council included this increase when the slate of nominees was presented. It is also worthy of note that the Armored Division Commanders of the two divisions stationed in Europe were included as council members. Although unable to attend council meetings, it was felt that this was a necessary move owing to the preponderance of Armor personnel in the Seventh Army.

Two resolutions were proposed and adopted during this session. A resolution proposing the wearing of the Garrison hat on the left side of the head as a means of identifi-

cation and to promote *esprit* and morale among Armor personnel was passed and forwarded to the Chief of Staff of the Army. Secondly, in view of the two years of outstanding leadership and able guidance rendered the Association by the outgoing President, General Williston B. Palmer was given a standing ovation for his services and a job well done.

Awards to ROTC graduates, newly commissioned West Point graduates choosing Armor as their basic branch, and OCS students being commissioned in the mobile arm were continued. Interest in ROTC awards increased greatly due to the awarding of books and honorary one-year memberships not only to institutions instructing in Armor but to schools with General Military Subjects. For the first time the Association presented a suitable award to the outstanding graduate from the Armor Officers' Advanced Class. In December we saw the Draper trophy being awarded to a platoon leader from the 1st Armored Division. (See story on page 34.)

One council meeting was held during the year. On the 4th of December the council met at Washington, D. C. A program committee was appointed to prepare for our forthcoming 69th Annual Meeting. Major General John L. Ryan, Jr., Commanding General, U. S. Army Armor Center, was appointed Chairman. Other committee members are: Major General Hamilton H. Howze, Commanding General, 82d Airborne Division, Fort Bragg, North Carolina; Major General L. L. Doan, Chief, Armor Sec-



tion, CONARC, Fort Monroe, Virginia; and Colonel Samuel McC. Goodwin, DCS/OPS, D/A, Washington D. C. A nominating committee was appointed; headed by Lieutenant General Willis D. Crittenberger, Retired; the other members are: Major General Donald W. McGowan, NGB, Washington, D. C., National Guard representative; Major General William M. Stokes, Jr., Army Reserve unit representative; and Lieutenant General George W. Read, Jr., Commanding General, Second Army, Fort Meade, Maryland; and Brigadier General Frank H. Britton, R&D, D/A, Washington, D. C., active duty representatives. The auditing committee was appointed and instructed to examine the books for the calendar year 1957. They also were asked to review the yearly report of the Secretary-Treasurer-Editor prior to publication. (This was accomplished on 28 January 1958.) Chairmanned by Brigadier General Willard A. Holbrook, Retired, the other members are: Brigadier General Creighton W. Abrams, OCSA, D/A; Brigadier General George R. Mather, DCS/PER, D/A; and Colonel Frederick W. Boye, OASA, D/A.

Total receipts for the year were greater than at any time since World War II. More than \$38,500 was taken in during the year. Although expenditures exceeded that amount it is well to point out that there are sufficient funds set aside for a contingent liability. Hence the magazine contained more pages this year. In addition there were expenses for the newsletter. Also at the year's end there were more equipment and supplies on hand—used for day-to-day office procedures—than in the past.

### The Magazine

Three issues during the year contained 80 pages; one 72 and two 64 pages. This is the largest number of pages printed during the incumbent's tenure in office. Four issues contained special features. The January-February issue put the spotlight on Armor activities in Germany; the May-June issue concentrated on the Annual Meeting; the September-October issue featured Armor in the National Guard and the last issue of the year featured the GOER Concept.

At our last council meeting held in 1956, the council gave the editor permission to explore the possibilities of promoting a joint meeting of all Armored Division Associations for 1960. This was done editorially through the Reconnoitering pages of the magazine. However, the response to date has been too meager to consider pursuing this idea any further at this time.

### The Newsletter

Monthly contact was established in January when the initial issue of the Newsletter was published. Circulated to all members and U. S. Armed Forces unit subscribers between issues of *ARMOR*, it is intended to disseminate short news items from The U. S. Army Armor School, Armored units to include reserve components, and other news releases of interest in the mobile field. The Newsletter is included with the membership costs of \$4.75 for one year or \$8.00 for two years. We also welcome the submission of material from Armored Division Associa-

## FINANCIAL REPORT

For the Year Ending 31 December 1956

### CASH RECEIPTS & EXPENDITURES

| Department  | Receipts           | Expenditures       |
|---|--------------------|--------------------|
| ARMOR Magazine                                      | \$30,523.05        | \$19,278.40        |
| Book Department                                     | 3,776.43           | 2,533.83           |
| Income from Investments                             | 468.20             |                    |
| District of Columbia Sales Tax                      | 2.89               | 2.99               |
| D. C. Personal Property Tax                         |                    | 41.38              |
| Postage   | 3.00               | 2,165.98           |
| Office Supplies                                     | 7.44               | 284.44             |
| Stationery & Printing                               |                    | 2,291.23           |
| Telephone & Telegraph                               | 2.25               | 399.27             |
| Machinery & Equipment                               | 40.35              | 114.10             |
| Maintenance & Repair of Equip.                      |                    | 10.50              |
| Rent  |                    | 2,420.00           |
| Janitor Service                                     |                    | 75.00              |
| Travel Allowance                                    |                    | 1,080.00           |
| Travel Expense                                      |                    | 8.55               |
| Express Charges                                     |                    | 21.77              |
| Executive Council & Editorial Exp.                  |                    | 212.18             |
| Fire Insurance                                      | 16.45              | 5.45               |
| Contributions                                       | 137.50             | 100.20             |
| Royalty on Book                                     | 75.49              |                    |
| Drayage   |                    | 97.85              |
| U. S. Savings Bonds Purchased                       |                    | 3,000.00           |
| Miscellaneous                                       |                    | 84.31              |
| <b>SUB-TOTALS</b>                                   | <b>\$35,053.05</b> | <b>\$34,227.43</b> |
| Cash Balance (1 Jan. 1956)                          | 3,097.45           |                    |
| Cash Balance (31 Dec. 1956)                         |                    | 3,923.07           |
| <b>GRAND TOTAL—CASH RECEIPTS &amp; EXPENDITURES</b> | <b>\$38,150.50</b> | <b>\$38,150.50</b> |
| <b>NET WORTH—December 31, 1956</b>                  |                    | <b>\$22,198.49</b> |

For the Year Ending 31 December 1957

### CASH RECEIPTS & EXPENDITURES

| Department  | Receipts           | Expenditures       |
|---|--------------------|--------------------|
| ARMOR Magazine                                      | \$34,517.80        | \$25,928.42        |
| NEWSLETTER  |                    | 2,241.96           |
| Book Department                                     | 3,554.98           | 2,419.94           |
| Income from Investments                             | 457.20             |                    |
| District of Columbia Sales Tax                      | 2.06               | 2.33               |
| D. C. Personal Property Tax                         |                    | 41.86              |
| Postage   |                    | 1,848.52           |
| Office Supplies                                     | 1.75               | 287.84             |
| Stationery & Printing                               |                    | 1,171.83           |
| Telephone & Telegraph                               | .20                | 403.35             |
| Machinery & Equipment                               |                    | 428.94             |
| Maintenance & Repair of Equip.                      |                    | 79.00              |
| Rent  |                    | 2,640.00           |
| Travel Allowance                                    |                    | 1,080.00           |
| Travel Expense                                      |                    | 22.70              |
| Express Charges                                     | 8.95               | 55.48              |
| Executive Council & Editorial Exp.                  |                    | 196.33             |
| Fire Insurance                                      |                    | 27.28              |
| Awards & Contributions                              |                    | 230.00             |
| Royalty on Book                                     | 18.91              |                    |
| Miscellaneous                                       |                    | 8.27               |
| <b>SUB-TOTALS</b>                                   | <b>\$38,561.85</b> | <b>\$39,114.05</b> |
| Cash Balance (1 Jan. 1957)                          | 3,923.07           |                    |
| Inactive Outstanding Checks                         |                    |                    |
| Cancelled   | 22.41              |                    |
| Cash Balance (31 Dec. 1957)                         |                    | 3,393.28           |
| <b>GRAND TOTAL—CASH RECEIPTS &amp; EXPENDITURES</b> | <b>\$42,507.33</b> | <b>\$42,507.33</b> |
| <b>NET WORTH—December 31, 1957</b>                  |                    | <b>\$22,256.49</b> |



## THE 69TH ANNUAL MEETING OF THE UNITED STATES ARMOR ASSOCIATION

The 69th Annual Meeting of the Association will be held at The U. S. Army Armor Center, Fort Knox, Kentucky, during the period 1-2 May 1958. The Program and Nominating committees, as appointed by the Association President and reported elsewhere in these pages, are already busy preparing for the biggest and best meeting held to date. Please reserve these dates and try to be with us. Members will receive official notices by first class mail in early March.

tions and others who feel they have a newsworthy item which should be considered for possible publication. The cost of the six Newsletters for the year is slightly below the cost of one 64 page issue of *ARMOR* without a color cover. At our Executive Council meeting held in December, your Secretary made inquiries of the members present as to the actual worth of the Newsletter and whether it should be continued. It was unanimously agreed to continue the Newsletter. At the present time we can publish 64 page issues of *ARMOR* and the Newsletter. It is believed that the present format and color combination of the Newsletter is in keeping with the style of the magazine.

### *The Book Department*

Book department receipts were slightly less than the preceding year. By comparing receipts and expenditures it would appear that our profits were great. However, it would be well to emphasize the fact that a book on equitation was completely sold out. This department had hundreds of copies on hand which had been purchased many years ago. Now that this item is sold out, book profits will not be as great in the future. We will continue to award books as prizes as long as we can financially afford it. We continue to give ten percent discount on all books ordered over \$5.00. We also pay the postage when your check accompanies the order. Book brochures continue to be our best advertising media. Books are advertised on a gratis basis in the magazine and are selected upon their worth to the military and our members. These selections are made by your office staff. Among the best sellers for the year were: *Panzer Battles*, by von Mellen-thin; *Drive*, by Codman; and *Patton and His Pistols*, by Perry and Parke; *American Military History*, Korea 1951-53 and *Korea 1950* were the three best sellers among the books published by the Office of the Chief of Military History.

*ARMOR* binders continue to be a good seller. Our stock on hand is ample and we will continue to re-order as the demands require.

The Association will utilize every possible effort to obtain any book ordered by members and unit subscribers.

### *Summary*

This consolidated report covering the business activities

of the Association from the home office during the calendar year 1957 leads us to believe that we are continuing on a sound financial basis. The facts are: Receipts have been greater this past year than at any time since World War II. We have been able to return more to our membership and unit subscribers through an increase in the number of pages in *ARMOR* and the publication of the Newsletter during the interim months of the magazine. We are continuing to issue membership cards and we are still awarding prizes.

Owing to Gyroscope many members and units are on the move. We would like to take this opportunity to remind one and all that magazines and newsletters are not forwarded as is first class mail. We need any address change as soon as possible. The cost of changing an address plate is minor compared to the loss of magazines because of wrong addresses. Keep us informed of your whereabouts and we will keep you informed with the latest in the field of mobile warfare.

The material continues to maintain a high degree of excellence, thanks to you who take time to write it up and submit it. This is a tribute to those who voluntarily send in material with the realization that they are assisting their fellow members. There is no compensation. From responses received to date, it can be said it is of the highest quality.

The permanency in value in the material can be attested to by requests for back issues covering a span back to the beginning of *ARMOR* in the summer of 1950 when the branch name was officially changed to Armor. Also the number of binders purchased during the year is indicative of the long-time value to our readers.

At the risk of too much repetition, it would be well to reiterate: this is your Association! The values to be obtained are directly in proportion to the efforts expended by the membership. This applies especially to the submission of material. The efforts exerted by each and every member to encourage additional people to join and obtain unit subscribers will result in a better magazine. The year 1958 can be as good as 1957 provided the same degree of support is obtained. This applies to Association activities concerning the Annual Meeting, the magazine or the newsletter.

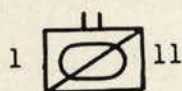
Recommendations and constructive criticism are always welcome.



# MILITARY SYMBOLS

**T**HE recent adoption of the Combat Arms Regimental System by the Army presents a problem in the portrayal by military symbols of units on maps and overlays. The problem is how to show the parent organization of the designated unit.

Military symbols for units whose title and designation have not been changed will remain as specified in FM 21-30, with Change 1. For example, the symbol for the 1st Squadron (Battalion), 11th Armored Cavalry, will continue to be as follows:



Military symbols for units of ROCAD, ROCID and ROTAD organizations will be formed in accordance with the principles of symbol construction in FM 21-30, with the following modifications. In writing the numerical designation of the parent organization of units affected by the Combat Arms Regimental System, both the battalion or battle group and the regimental numerical designations

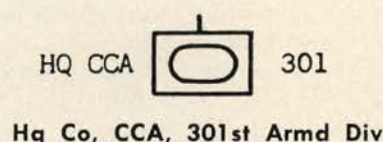
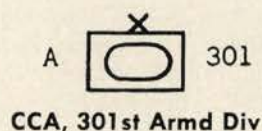
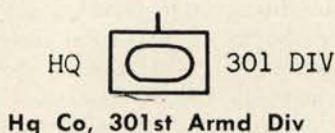
will be included, separated by a slash—for example, 1/31 for the 1st Medium Tank Battalion (Patton), 31st Armor; 1/41 for the 1st Battle Group, 41st Infantry.

The Armor School prescribes this method based on the following interpretation of paragraph 13f of FM 21-30 which states in essence that numbers designating *separate units* are placed on the right of the symbol. Battalions and battle groups organized under ROCAD, ROCID, and ROTAD, while specifically identified by means of a regimental designation under the Combat Arms Regimental System, are still separate units with separate TO&E's that are not organic to a parent regimental organization as is the case with the old infantry regimental or the current armored cavalry regimental organizations. Further, since the regiment under the Combat Arms Regimental System is not a tactical unit with controlled organization and equipment, it does not completely fit the definition of a parent unit given in paragraph 13j; and since the battalion and battle group do not have specific numerical designations which are not duplicated

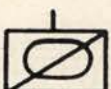
by any other unit of the same type, they do not completely fit the definition; both designations are necessary therefore, if the requirement of placing the parent unit designation on the right is to be met. Thus in order to specifically identify the numerical designation of battalions and battle groups in ROCAD, ROCID, and ROTAD, it is necessary to show the battalion numerical designation immediately adjacent to the Combat Arms Regimental designation on the *right* of the symbol. This method immediately tells the reader that this numerical designation indicates a *separate* battalion or battle group with its regimental derivation under the Combat Arms Regimental System. Too, this method ensures simplicity by the continuous use of the same unit designations whether it be to designate unit boundaries and symbols on maps and overlays or to list unit designations in appropriate field orders.

The branch symbol will in all cases correspond to the designation of the parent organization placed to the right of the symbol.

The following symbols illustrate these techniques.






A  1/31


Trp A, 1st Recon Sq, 31st Cav

1 TK A  1/31


1st Tk Plat, Trp A, 1st Recon Sq, 31st Cav

1 TK (TM) A  1/31


1st Tk Plat Team, Trp A, 1st Recon Sq, 31st Cav

RIFLE (TM) A  1/31

Rifle Plat Team, Trp A, 1st Recon Sq, 31st Cav

 1/101

1st Armd Rifle Bn, 101st Inf

TF  1/101

Task Force 1/101 (battalion task force formed around 1st Armd Rifle Bn, 101st Inf)

A  1/101


Co A, 1st Armd Rifle Bn, 101st Inf

HQ  1/101

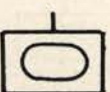
Hq Co, 1st Armd Rifle Bn, 101st Inf

SCT  1/101


Sct Plat, Hq Co, 1st Armd Rifle Bn, 101st Inf

 1/1

1st Med Tk Bn (Patton), 1st Armor

HQ  1/11

Hq Co, 1st Med Tk Bn (Patton), 11th Armor

 1/11  
↑ 4.2

Mort Plat, Hq Co, 1st Med Tk Bn (Patton), 11th Armor

A  1/11

Co A, 1st Med Tk Bn (Patton), 11th Armor

B (TM)  1/11


Team B (company team formed around Co B, 1st Med Tk Bn (Patton), 11th Armor)

 301


301st Armd Div Arty

HQ  301 DIV

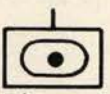
Hq Btry, 301st Armd Div Arty

 1/61  
|| 105

1st How Bn (105mm) (SP), 61st Arty

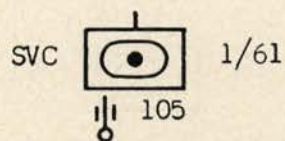
HQ  1/61  
|| 105

Hq Btry, 1st How Bn (105mm) (SP), 61st Arty

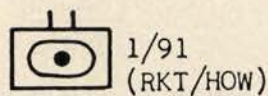
A  1/61  
|| 105

Btry A, 1st How Bn (105mm) (SP), 61st Arty

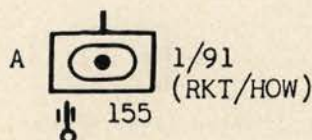




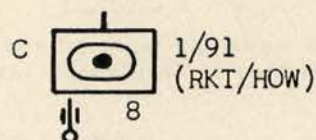
Svc Btry, 1st How Bn (105mm) (SP), 61st Arty



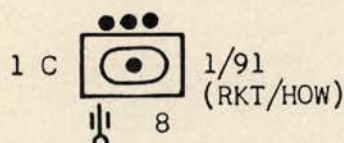
1st FA Bn (Rkt/How), 91st Arty



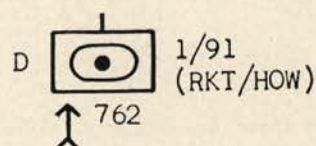
Btry A (155mm How) (SP), 1st FA Bn (Rkt/How),  
91st Arty



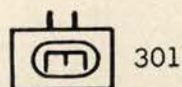
Btry C (8-in How) (SP), 1st FA Bn (Rkt/How),  
91st Arty



1st Plat, Btry C (8-in How) (SP), 1st FA Bn  
(Rkt/How), 91st Arty



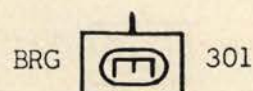
Btry D (Honest John) (SP), 1st FA Bn (Rkt/How),  
91st Arty



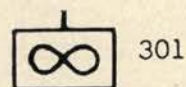
301st Engr Bn (Armd Div)



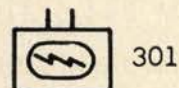
Co A, 301st Engr Bn (Armd Div)



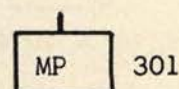
Brg Co, 301st Engr Bn (Armd Div)



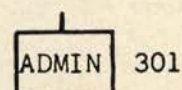
301st Avn Co (Armd Div)



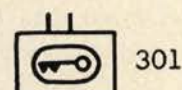
301st Sig Bn (Armd Div)



301st MP Co (Armd Div)



301st Admin Co (Armd Div)



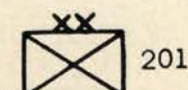
301st QM Bn (Armd Div)



301st Ord Bn (Armd Div)



301st Med Bn (Armd Div)



201st Infantry Division





 1/21  
1st Bat Gp, 21st Inf


A  1/21  
Co A, 1st Bat Gp, 21st Inf

RECON  1/21  
Recon Plat, Hq Co, 1st Bat Gp, 21st Inf

1 A  1/21  
1st Plat, Co A, 1st Bat Gp, 21st Inf

2 1 A  1/21  
2d Squad, 1st Plat, Co A, 1st Bat Gp, 21st Inf

2 B  1/21  
81  
2d 81mm Mortar Squad, Wpn Plat, Co B, 1st Bat Gp, 21st Inf

2 C  1/21  
106  
2d Antitank Squad, Wpn Plat, Co C, 1st Bat Gp, 21st Inf

Boundary designations will be indicated as specified in FM 21-30, with the modification as previously discussed. Examples of boundary designations are given below. From left to right they show 201st Infantry Division and 301st Armored Division; 1st Med Tk Bn (Patton), 11th Armor (1/11), and 1st Armd Rifle Bn, 101st Inf (1/101); and Co A, 1st Armd Rifle Bn, 101st Inf, and Co B, 1st Armd Rifle Bn, 101st Inf.

201  301

1/11 = 1/101

A — B

In the preparation of operation or administrative orders, or at any other time when brevity is necessary and confusion or misunderstanding will not result, unit designations may be shortened as follows:

1st Armd Rifle Bn, 101st Inf—  
1/101 Inf.

1st Med Tk Bn (Patton), 1st Ar-  
mor—1/1 Armor.

1st Recon Sq, 31st Cav—1/31 Cav.



*This is the first medium tank recovery vehicle ever designed from the ground up expressly for the purpose intended*

# The T88 Assault Recovery Vehicle, Medium

By EUGENE A. SIDERS



All Photographs  
Bowen-McLaughlin-York, Inc.

**D**ESIGNED to operate primarily with the M48A2 Tank, this recovery vehicle utilizes many parts common with the tank. The basic engine, track and suspension components, some controls, periscopes, seats, electrical components and many other miscellaneous items

are common between the tank and the recovery vehicle.

With the use of common components, however, similarity ends. The T88 is the first medium tank recovery vehicle ever designed from the ground up expressly for the purpose intended.

Based upon experience gained from working with the M74 and preceding recovery vehicles, the Continental Army Command developed a set of requirements and characteristics to cover the exact type of recovery vehicle needed. These requirements included all of the best features of previous models and necessitated the development of many additional features.

*The hull and crew compartment,*

in cross sectional aspect, is shaped to utilize to the maximum the area available within the limiting transportation clearances.

The general configuration provides maximum armor protection, maximum tractive effort in unfavorable terrain and is symmetrical about the vertical centerline to provide a balanced dimension to center of gravity.

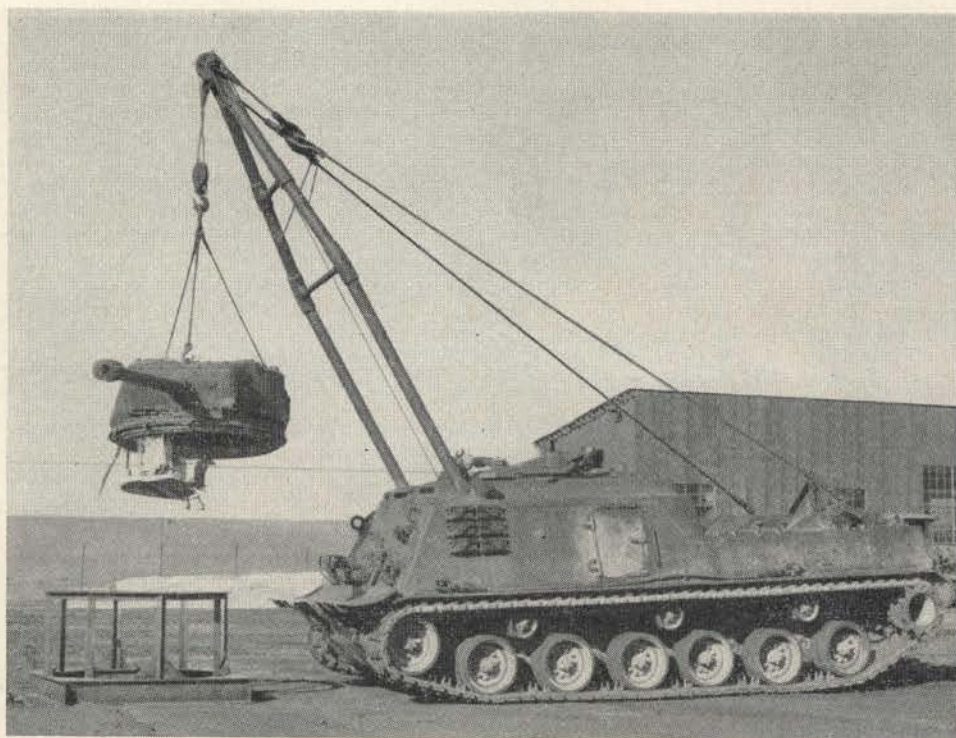
In longitudinal section the hull is shaped to provide maximum approach and departure ability. It is also designed to afford an armor balance in line with major component arrangement to effect the best possible center of gravity and balance for hoisting, winching, dozing and towing operations.

*The hull is expressly shaped to*

EUGENE A. SIDERS has been associated with industry for more than 30 years, more than half of which has been spent exclusively on Ordnance work. For the last ten years, with Bowen-McLaughlin-York, Inc., the author has been responsible for engineering control through the remanufacture of approximately 7,000 army tanks. He has, during this time, been in charge of engineering staffs charged with designing major modifications of tanks and components. Probably the best known of these works is the M74 Recovery Vehicle, based upon the M4A3 tank chassis.



The boom is a modified "A" Frame, and is powered by dual hydraulic cylinders. It has been tested in handling loads of more than 50,000 lbs. It also has a greater lifting height of more than 22 feet



afford maximum forward vision and approach aspects for driving, dozing, hoisting and winching operations.

The crew compartment, with a volume of more than 300 cubic feet, provides ample space for stowage for comfortable crew and passenger seating, and for convenient arrangement of equipment and controls.\*

Two winches are incorporated in the vehicle to handle all recovery operations.

Located in lower hull, the winches are separated from the crew com-

partment by removable floor plates.

The main winch (90,000 lbs. capacity) and the hoist winch (50,000 lbs. capacity) are of well proven design. Equipped with automatic brakes, these winches are driven by reversible hydraulic motors, thereby affording single lever control for all normal winching operations.

The boom is a modified "A" Frame, and is powered by dual hydraulic cylinders. It is tubular in structure and has been tested in handling loads of more than 50,000 lbs. The boom

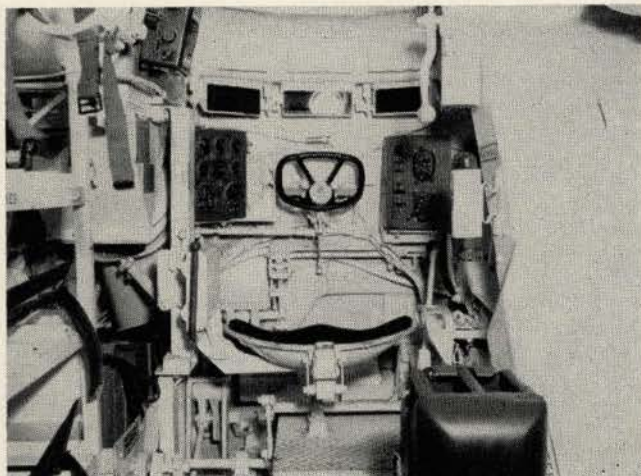
is mounted on the front top portion of the vehicle and affords a lifting height of more than 22 feet.

The boom is normally pre-rigged while stowed and is thereby ready for instant use. It may be elevated to full forward hoisting position with a single control lever. This position gives a clear reach of 96 inches while vehicle is stabilized and 78 inches when the vehicle is mobile. From this position, and with the same control lever, the load may be moved through a live-boom arc of 48 inches

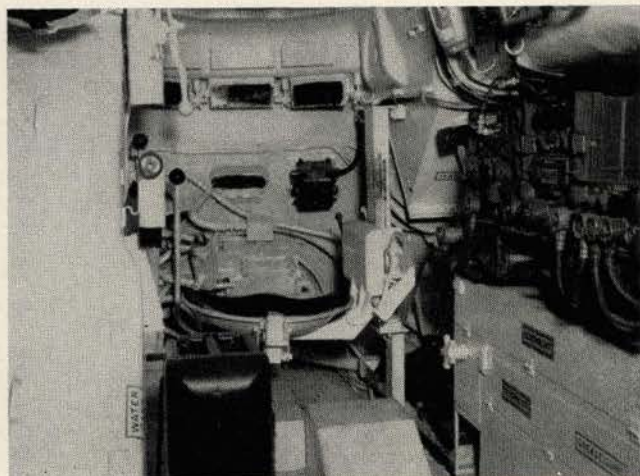


The T88 Assault Recovery Vehicle, Medium, is shown towing an M48. It is using the main winch which has a capacity of around 90,000 lbs.





Crew Compartment—Left Front



Crew Compartment—Right Front

which approximates  $14\frac{1}{2}$  degrees.

*Live-boom movement* is obtained through additional dual hydraulic cylinders which power the stayline crankarms. This design permits shifting and spotting of maximum hoisted loads.

As a positive safety means, to prevent accidental overshifting of load toward top dead center of boom arc, an automatic valve is connected to each crankarm cylinder, which limits the live-boom movement to  $14\frac{1}{2}$  degrees of arc. At this point, it is necessary for the operator to use an additional control valve to continue the boom movement rearward into stowed position.

The *spade-dozer* is stowed in full elevated position, in front of the vehicle while traveling. It is powered by dual hydraulic cylinders, connected to the spade pivot by crankarms, and is controlled with a single lever located at the driver-operator station.

Primarily, the spade-dozer, when lowered completely, stabilizes the vehicle when heavy loads are winched or hoisted.

Bulldozing with the spade-dozer is efficient and compares satisfactorily with special purpose equipment designed for this function.

Provided with ample motive and holding power the spade-dozer may be used for a variety of functions such as stabilizing, dozing, leveling, clearing and lifting.

Automatically secured upon stowing, the spade-dozer, in this position, may be used effectively to augment

the vehicle's ability to negotiate vertical obstacles.

All controls are conveniently grouped about the driver-operator. This requires only one man to remain within the vehicle during recovery operations and allows more freedom for the rest of the crew to perform their respective duties.

These controls are simple, positive, and of single lever design. Fully equipped with safety devices, all hydraulic controls are automatically returned to neutral, in which position all hydraulic power units are off, and brakes are automatically applied.

The *power take-off* unit is of self-contained design, driven by the main engine through a short universal drive shaft. The main hydraulic pump is mounted directly to the out-put end of the power take-off.

The unit may be engaged or disengaged while the engine idles. The power take-off is equipped with a governor to limit the main engine speed to 1800 rpm when the main hydraulic pump is operating.

From a self-contained reservoir, lubrication is automatically force-fed and cooled thereby providing for heavy duty operation.

The *hydraulic system* is of series-parallel design, based on Ordnance proven elements and components.

The main pump and winch motors have been equipped with integral self-contained control valves, thereby effectively reducing the normal requirement for lines and connections.

Cylinders for winch brake opera-

tion are powered directly from the winch motor circuits. This improvement provides fully automatic brake operation and eliminates the requirement for a separate hydraulic pump, the appendant lines and manual control valves.

The main winch operation is augmented with an automatic hydraulic level-wind unit thereby providing for efficient winch operation and maximum cable life.

The *auxiliary hydraulic system* is powered with a small pump directly connected to the auxiliary generator engine. Safety devices protect the engine from overload.

In case of emergency, when the main engine, power take-off, or other components are inoperative, this auxiliary system may be engaged by operating a lever-type selector valve, which, in turn, directs a limited oil supply into the main hydraulic system thereby allowing operation of the boom and spade.

A second valve is provided which will operate an additional small hydraulic motor and fuel pump. This pump will handle 25 gallons of fuel per minute and can be used for refueling and defueling operations.

This auxiliary hydraulic system also furnishes power for a newly designed hydraulic impact wrench. This power wrench, developed by the contractor especially for this application, is equipped with sufficient length hose to reach all parts of the vehicle as well as to be able to service companion vehicles.



*The platoon leader who stresses simplicity in planning and practices close, continuous communication stressing minimum usage of the radio will find his platoon operating on good basic principles*

# Simplicity of Plan and Dependable Communication

By **FIRST LIEUTENANT WILLIAM C. HAPONSKI**

**I**NHERENT needs in tank platoon tactical training are simplicity of plan and dependable, continuous communication.

We have heard that the plan must be simple, yet many times we have seen this precept violated. The tank commander or tank section leader certainly has enough to occupy his mind during the conduct of a tactical problem without needlessly confusing him with complex operations orders. The plan should be reduced to fundamentals to insure that in the quickly changing situations of a tactical exercise, the tank commander or section leader can effectively employ his tank or section according to the platoon plan as he simultaneously controls the actions of his crew. Aggressor harassment is less likely to shake him from his part in executing the plan if the plan is simple.

## Simplicity of Planning

What is meant by simplicity of planning? This phrase resolves directly from one of the nine principles of war, the principle of simplicity. The ultimate in simplicity of platoon planning would be this: each individual tank commander or section leader will be capable of fully understanding his role in the platoon plan;

he and his equipment will be capable of the performance required, all risks will be calculated and eliminated.

Although we may never be able to attain the ultimate by the complete fulfillment of all three qualifications in planning any given operation, we can reduce our planning to fundamentals so as to be reasonably assured the individuals concerned are capable of comprehension and could, according to their own capabilities and those of their equipment, execute the plan with a minimum of risk.

We know that different individuals possess varying capabilities to comprehend. This is taken into consideration in striving for the simple plan. The tank commander must first be able to fully understand the plan before he can execute it. If there is any phase too complex for him to grasp, the whole platoon may fail in its mission.

The capabilities of our men and their equipment are many times not adequately considered in our planning. A man is generally capable of a certain level of performance. Sometimes, he can outdo himself and perform a difficult task extremely well. At other times, he may fail miserably in an easy one. Generally though, we can expect a certain degree of accomplish-

ment from a given individual in a given situation.

Barring mechanical failure, equipment performs according to certain standards. Unlike the individual, the equipment cannot be counted on to outdo itself in any given instance. A tank will climb a certain slope and no more. It will go just so far on a full tank of gasoline and no farther. In striving for simplicity in planning, the individual's capabilities and the capabilities of his equipment must be considered.

It is said, never to gamble is never to win. To incur needless risks is, however, foolish. If the platoon leader adequately considers the level of his men's comprehension, their individual capabilities and the capabilities of their equipment, he has automatically gone a long way toward risk minimization.

Recently, in the early stages of basic unit training, a platoon of trainees failed to execute an effective attack upon a platoon size objective.

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**FIRST LIEUTENANT WILLIAM C. HAPONSKI**, Armor, graduated from USMA in 1956. After attending the Basic and Airborne courses he was assigned to the 4th Armored Division as a Tank Platoon Leader. Gyroscoping with the Division he is now the Scout Platoon Leader, Headquarters Company, 1st Medium Tank Battalion, 35th Armor, 4th Armored Division, now in Germany.



This failure was due to a lack of simplicity in plan. One important simplification might have led to better results in the attack.

A lieutenant, as platoon leader, and a sergeant first class were the only experienced tank commanders. The other three tank commanders and all other crew members in the platoon were trainees.

The plan of attack was not complex. It called initially for a movement in column from the assembly area. The terrain prohibited further deployment in the attack position and the platoon was to continue on through to the assault position in column. Here the platoon was to split up, one section to be a base of fire and the other, plus the platoon headquarters tank, to be the maneuver element. This general outline for the operation conforms to standard doctrine. Attacks executed in this manner have succeeded time and again.

The platoon leader led out of the assembly area followed by the maneuver section and then the base of fire section. The platoon passed through the attack position in column and approached the assault position. So far, the movement had been completely covered and concealed from the aggressor position. The platoon leader reached a predetermined draw and halted with his maneuver section. The platoon sergeant continued on with the base of fire section. He was to proceed to another draw, some 500-600 yards farther on. At this place, he was to move into defilade firing positions and, eight minutes after separation from the maneuver section, he was to lay down a base of fire as the maneuvering element assaulted.

Unfortunately, the platoon sergeant missed his assault position in this draw and lost several minutes in searching for it. Meanwhile, the maneuver element had been detected while moving into position on line for the assault. As soon as he realized he was discovered, the platoon leader launched his maneuver element in the assault in an attempt to make the best of the situation and retain some of the surprise already gained. However, one of the basic elements in the plan was missing. There was no base of fire to support the maneuvering force. Approximately 40% of the platoon's available firepower was lost in the final assault with the base of fire missing. Had this been combat, that maneuvering force might have found things tough going.

One simplification, a change in march order for the two sections, seems to offer more hope for success. This proposed plan still provides for essentially the same action in the final assault, calling for a base of fire element and a maneuver element.

Again, the platoon leader leads his tanks in column out of the assembly area. This time, however, he is followed by the base of fire section and then his maneuver section. The platoon sergeant rides the number two tank in column and the other section leader is in the fourth tank. Since the terrain permits, the positions for the base of fire force and the maneuvering force will simply be switched.

As the platoon leader reaches the first draw, he motions the platoon sergeant in the tank behind him to position his base of fire section. In this arrangement, the platoon leader will have had direct visual contact with the platoon sergeant since they left the assembly area. There is much less chance for the base of fire section to go astray since it will have been physically placed by the platoon leader.

Tanks four and five now catch up to the platoon leader and the maneuver element continues to move toward its position. Again, the platoon leader has direct visual contact with the section leader in the tank behind and can easily motion him into position for the assault.

When the maneuver element nears its assault position, a signal will place the base of fire into operation. The maneuver element may take up its assault formation and launch the assault without stopping. This solution does not depend upon the arbitrary, and somewhat unreliable, time lapse of a certain number of minutes.

While we should not dwell too much on tactical advantages in discussing simplicity of plan, there are certain advantages we cannot overlook. In this example, the base of fire section is emplaced first. It can, therefore, quickly pin down the enemy and draw fire away from the maneuvering element should this element be prematurely discovered in

moving to its new assault position.

Review for a moment the greater simplicity and resultant better control in this second suggested plan. The platoon leader has direct visual contact with the platoon sergeant in the tank behind. He can physically emplace his base of fire section and expect covering fire, if needed, for the remainder of the maneuver element's movement to the assault position. The maneuver section may close on the platoon leader and now can be physically controlled by the platoon leader. This maneuver element may now move into position and immediately launch its assault, supported by the covering fires of the base of fire section. Simplicity of planning will greatly improve our tank platoon tactical training.

### Dependable Communication

When communication is mentioned in armored units, the first thing that comes to mind is, of course, the radio. Without the radio, the armored division would be ineffective. On all levels above the tank platoon, radio communication is a necessity. Within the tank platoon, however, radio communication is not so much a necessity as an asset. Initial enemy contact reports, vehicle out of action reports, casualty reports and others are sometimes necessary. Nevertheless, there are several advantages to be gained by training the tank platoon in a minimum use of the radio.

First, the number of transmissions within the company is limited to a reasonable number. When you consider that within the tank company there are 23 T/O&E radios plus a few more from any attached units, the desirability of limiting the number of transmissions is obvious. The company commander can get very perturbed if he is trying to call an important message to his platoon leaders and he hears something like this within one of the platoons: "Redboy 16 Charlie, this is Redboy 16 Bravo, Uhhhhhh—move over a little to your left,—your left. That's it, now swing slightly toward me—" etc, etc, etc.

Next, a radio failure is not so serious a matter if the tank commanders and section leaders have been trained to look to their commander for visual signals.

There has never been a mechanical device produced by man which



has proven 100% operational at all times. The tank radio is no exception. It is a wonderful piece of equipment but it gets some hard usage and many times fails to operate at a critical moment.

An operational failure can result in serious adverse consequences if the platoon have become accustomed to receiving all their instructions *via* the headsets they wear. Too many instructions received by this means tend to break down the tank commander's attention to his section or platoon leader for visual signals. If this happens and a radio failure occurs, the platoon leader may find himself standing in his turret frantically waving his arms in an attempt to get attention and discover that not one tank commander notices him. The tank commander knows from past experience that if the section or platoon leader wants him to do something, the instructions will come over the air. Hence, he looks neither to the left nor right and fails to notice the exasperated platoon leader. The platoon may fail in its mission due to this lack of attentiveness for visual signals.

The use of initiative by the tank commander or section leader suffers if he has been trained to use the radio extensively for platoon communication. The tank commander never has to select a good firing position for himself when his section leader always jockeys him into it *via* the air waves. The section leader never has to pick good routes to a position when his headset exclusively controls his movements. These tankers in this case are missing some valuable training in the use of initiative.

Examine once again the main advantages to be gained from training the platoon with a minimum use of the radio within the platoon.

1. Radio traffic within the company will be simplified.
2. A radio failure at a critical time is a less serious problem.
3. Tank commanders and section leaders receive training in the use of initiative.

There are many visual means of communication. In the tank platoon, the most frequently used visual signals are arm and hand signals. The standard signals and all other good arm and hand signals portray by

means of an image the action to be executed. A discussion of the basic arm and hand signals is unnecessary here. Some of the difficulties in application and possible solutions to them merit consideration, however.

Arm and hand signals are a means of control; therefore, the platoon leader must select his position in a given formation with this control factor in mind. The formation and placement of both the platoon and section leaders within the formation depend largely upon the mission and plan of action. Only general rules can be stated since the action taken will vary with different situations.

In a column formation, if the platoon leader has given a section a mission which requires independent action by that section for a period of time, this section leader will generally be initially positioned adjacent to the platoon leader in the column. This placement allows the platoon leader to more easily visually contact this section leader. This contact is maintained up to the point where the section is released on its mission. This visual contact assures the platoon leader that this section has at least been properly started on its mission.

If the platoon leader is in the lead tank or the third tank in column, one of his section leaders should generally be in the second tank and the other in the fourth. Aside from tactical advantages to be gained, this positioning puts the platoon leader in best visual contact with his section leaders.

When the platoon is operating independently as a maneuver element and is in a line formation, the platoon leader should usually position himself in the center of the formation with the section leaders on either side and adjacent to him. If operating within a company line formation, the platoon leader will adjust his position in his platoon formation to allow best visual contact with the company commander. Many times this means he will be on the flank of his platoon.

To effectively use arm and hand signals within these formations, two important considerations must be impressed upon the tank commanders and section leaders. They must watch their next higher commander for his signals and they must pass the signals

on to the adjacent tank in formation.

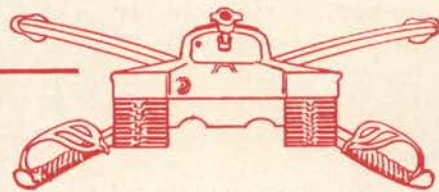
Regardless of the difficulties involved in operation of their own vehicle, tank commanders must be alert for signals. Mechanical difficulties tend to greatly distract the tank commanders, and visual contact suffers. By one means or another, the tank commanders must be trained to be mentally alert.

The tank commanders must automatically pass on signals. Dust or other conditions of poor visibility are sometimes so bad that adjacent tanks have difficulty in seeing each other. If one man does not pass on a signal, much of the effectiveness of the formation has been lost. Visualize a formation in which the first three tanks in column have gone into line formation and the fourth and fifth are still in column due to a failure of the third tank commander in column to pass on the signal. This "line" formation leaves something to be desired in maximum firepower to the front.

The standard arm and hand signals are many times insufficient to control effectively. Within the platoon, signals should be worked out to convey various meanings. For example, confusion arises when a platoon leader tries to convey meaning to a specific tank when all tanks are nearly on line. The tank commander wonders, "Is he signaling to me or to the next tank in line?" A simple signal to clear up this point of confusion might be for the platoon leader to point low for the closest tank or high for the farthest to get the tank commander's attention and then give the signal to the intended recipient. Many other methods will work for this and similar situations. The important thing is, additional signals, understood by all, are many times necessary to the operation of a tank platoon which is being trained by using extensive arm and hand signals.

The platoon leader who stresses simplicity in planning and practices close, continuous communication stressing minimum usage of the radio will find his platoon operating on good basic principles. The platoon will be geared toward simple thinking and simple action. The resultant simplicity and better control will greatly improve the tank platoon's effectiveness as a hard-hitting, fast-moving combat unit.





## news from THE US ARMY ARMOR SCHOOL

### Change to FM 17-79

Change 1 to FM 17-79, Tank, 90mm Gun M48 which was recently published, is of special interest to all units equipped with M48 tanks, since it includes information on the commander's cupola, M1. The nomenclature, fire-control equipment, characteristics, mounting of the caliber .50 machine gun and other points peculiar to the cupola are covered in detail in this change.

Chapter 5, FM 17-79 is also superseded by this change. The new chapter contains the prescribed Tank Gunnery Qualification Courses and Gunnery Qualification Standards.

Date of publication of this change is 18 July 1957 and, therefore, should be in AG Publication channels at the present time. All units equipped with the M48 tanks should secure this change.

### Tank Gunnery

#### Confidence

During the past year the pages of *ARMOR* have been devoted more and more to the subject of Tank Gunnery. Some of the articles were:

- Gunnery is Not a Stepchild
- Tank Gunnery Training in the Seventh Army
- Tank Crew Proficiency Courses
- Recommended Changes for Tank Gunnery Qualification Tables
- Safety in Tank Gunnery Training
- Miniature Tank Target Firing Range
- 24 Hour Firepower
- Preparing for the Payoff at Bel-sen Hohne
- Tank Gunnery: Economy plus Quality

These and many more prove that interest in Gunnery Training is on the upswing and that gunnery is becoming a star attraction. Gunnery

—good gunnery—is a combination of confidence, equipment and training. If one element is missing, the hope for superior gunnery may not only fade, it may vanish! Why is confidence a chosen element? FM 21-6, *Techniques of Military Instruction*, states "The instructor will find that, if he is sold on his subject and conveys this feeling to the class, he will keep his students interested and eager to learn." If the unit commander and his subordinate leaders are sold (confident) on their subject and equipment, training will be much more effective. A good salesman must show confidence in his product regardless of any faults that he personally feels are present in the product. It is apparent that some Armor Leaders (young and old) do not show such confidence in our present equipment, and actually omit the use of certain items of equipment during the course of training. An example of this omission is the stereoscopic range finder found on our present day medium tank. If proper range finder training is not conducted in a unit equipped

with medium tanks, a costly fire control system is being neglected, and a unit's ability to obtain fast first round hits is being suppressed. We must also show confidence in the stamp of approval which CONARC Boards have placed on equipment in the hands of troops and in the courses of training (ATP's) set forth by Department of the Army.

*Equipment.* "Boresighting procedure for the M48A2 Tank."

For the M48A2 Tank some minor changes must be made to current boresight and emergency zero procedures outlined in paragraphs 32 and 33 of FM 17-79, Tank 90mm Gun M48.

1. Remove all superelevation *before* aligning the axis of the bore on boresight point (because of superelevation action).

2. Use range reference marks (in red) on the M13A1 Range Finder and M20A3 Periscope to obtain a 1500 yard boresight setting when a 1500 yard target is not available. Lock the boresight knobs after rotating the boresight knobs as necessary to move

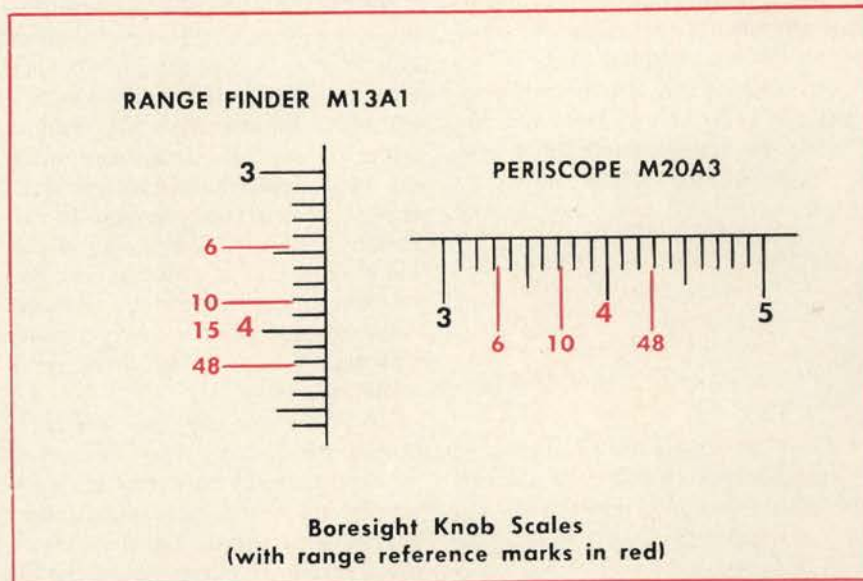


Figure 1



the aiming cross (periscope and range finder) exactly on the boresight point.

If selected boresight range was:

|      |                              |
|------|------------------------------|
| 600  | Red 6<br>(both az and elev)  |
| 1000 | Red 10<br>(both az and elev) |
| 4800 | Red 48<br>(both az and elev) |

3. Emergency zero is accomplished the same as outlined in FM 17-79; however, the following procedure should be added. After boresighting and emergency zero have been established on the range finder gun-laying reticle and periscope; using the turret controls, lay the aiming cross on an aiming point (index 1500 on range scale when using red range reference marks); turn on the auxiliary gun-laying reticle and with unlocked boresight knobs, superimpose the auxiliary gun-laying reticle on the gun-laying reticle.

Equipment. "Metric System."

AR 700-75 dated 14 May 1957 establishes the policy that all U. S. Army weapons and related equipment will be converted to the use of the meter for measurement of linear distances by 1 January 1966. "All existing survey and fire direction equipment for U. S. Army Weapons,—will be converted with the least practicable delay.—" "All U. S. Army weapons and related equipment, to include sighting and fire control equipment, firing tables, charts, range finders, radars, training aids, and other auxiliary equipment now in development and developed in the future, will be designed to employ the meter as the unit of linear measurement."

It is anticipated that during the period of conversion (present to 1966) tank sighting and fire control equipment, and training literature may have a combination of yards and meters for linear measurement. As an example the meter is employed as the unit of linear measurement in FM 6-135, *Adjustment of Artillery Fire by the Combat Soldier*, dated July 1957; however, artillery fire control equipment, firing tables, etc., are at present in yards.

A ready conversion factor may be

useful during the period of conversion. To convert yards to meters, multiply "yards" by .9 (or .914402). Example: 1500 yd x .9 = 1350 meters. To convert meters to yards, multiply "meters" by 1.1 (or 1.09311). Example: 1500 meters x 1.1 = 1650 yds. Training. "Tank Gunnery Training Literature."

The July-August 1956 issue of *ARMOR* had a news item from the Armor School (page 51) listing "references for tank gunnery training" which a commander and his staff should use in planning and preparing such training. To this list each Armor unit should now add Change 1 FM 17-79, dated 18 July 1957 and Change 1 to FM 17-80, dated 9 September 1957. Change 1 to FM 17-79 includes information on the commander's cupola M1, a computer check and the new tank gunnery qualification course.

The complete tank gunnery qualification course covers the gunner's preliminary examination, subcaliber firing exercises and service firing exercises. The tables are now fired in two courses:

1. Limited—tables I thru V (subcaliber firing exercises).
2. Standard—tables V thru VIII (service firing exercises).

Each tank crewman must pass each test of the gunner's preliminary examination before firing either the limited or standard course, and gunners must attain a score of 300 or higher on the limited course before they can fire the standard course.

The following indicates the title and a summary of purpose for each of the Tables I through VIII:

*Table I—First-Round-Hit and Burst-on-Target Exercise, 200 feet.*

The purpose of this exercise is to test the gunner's ability to zero the caliber .30 machine gun, using the primary sight; to teach correct sight picture and accuracy of lay; and to test the gunner's ability to use the primary method of adjustment (burst-on-target) prior to firing service ammunition.

*Table II—Manipulation Exercise, 1000-inch.*

The purpose of this exercise is to test the gunner's ability to manipulate the gun controls rapidly and to engage stationary targets, firing single-shot.

*Table III—Moving Target Exercise, 200 feet.*

The purpose of this exercise is to test the gunner's ability to lead, track and adjust fire on moving targets prior to firing service ammunition.

*Table IV—Auxiliary Fire-Control Exercise.*

The purpose of this exercise is to test the ability of the gunner in the proper use of the tanks auxiliary fire-control instruments.

*Table V—Zeroing Exercise, Service Firing.*

The purpose of this exercise is to test the gunner's ability to zero the primary and secondary direct-fire sights using shot ammunition on a 6x6 foot range target at a range as near 1500 yards as possible.

*Table VI—Service Firing Exercise, Stationary Targets at Variable Ranges (HE and SHOT Adjustment).*

The purpose of this exercise is to test the gunner's ability to obtain a first-round hit firing service ammunition at stationary targets.

*Table VII—Moving Target Exercise.*

The purpose of this exercise is to test the ability of the gunner to hit a moving target.

*Table VIII—Range Card Firing Exercise.*

The purpose of this exercise is to test the ability of the gunner to determine prearranged firing data for selected targets and to engage area type targets successfully with HE ammunition under conditions of restricted visibility.

### Radiotelephone Procedure

Commanders must insure that training in proper radiotelephone procedure emphasizes the detrimental results caused by:

1. Transmitting unnecessarily.
2. Transmitting too rapidly.
3. Failing to use prowords to expedite traffic thus causing confusion and delay.
4. Failing to end a transmission with the correct proword.
5. Failing to transmit clearly.
6. Failing to reply promptly.

Such procedure violations can be just as damaging as discussing classified information over the air. The enemy takes advantage of every mistake we make—so don't give him a chance—Use correct radiotelephone procedure at all times!



# NEWS NOTES

## A Lightweight Mine Detector

A mine detector weighing only one fourth as much as the current standard model has been developed by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, the Department of the Army announced recently.

The seven-pound detector, designed to locate mines with metal components, is equipped with transistors instead of electron tubes. It has four times the battery life of the standard model. In addition to reducing overall weight, sensitivity has been increased and stability improved. Maintenance, always a problem in the field, has been simplified to such a degree that operators can perform major repairs.

Major weight reductions have been accomplished in the electronic assembly worn on the operator's standard military cartridge belt. This 7" x 5" x 1" unit consists of four hermetically sealed plug-in subassemblies each containing several transistors with their associated circuitry. Repairs involve merely replacing one or more of these compact, plug-in units with a spare.

The search head is mounted on a collapsible handle through which wiring connects it with the electronic and head set assembly. A control box attached to the handle contains a combined power-sensitivity switch and an indicating meter.

In operation, metal upsets the search head balance, the electronic assembly amplifying this unbalance signal for headset and meter indication.

Built by Texas Instruments, Inc., Dallas, Texas, under negotiated contract with the Laboratories, the detector has passed all engineering tests and is now ready for field testing.

## More APCs

The Army has just awarded the Food Machinery and Chemical Corporation of San Jose, Calif., a \$51,500,000 contract to produce additional amphibious M59 armored personnel carriers.

A fast tracked land vehicle capable of crossing water or climbing steep slopes, the M59 gives mobility and firepower to the Army's new Pentomic divisions. In addition, it offers protection against blast and small arms fire.

The M59 can double as a mobile command post, a communications center, or provide logistical support besides carrying 12 fully-equipped infantrymen. Constant improvement on the vehicle since it was designed in 1952, has given the modern infantryman the most maneuverable armored carrier in Army history.

## Combat Surveillance

Development of combat surveillance methods for the Army is provided for in a two-year contract awarded to the Cornell Aeronautical Laboratory, Buffalo, New York, the Department of the Army announced recently.

Combat surveillance is the continuous and systematic watch over a battle area under all conditions of weather by day and night, and is of direct and important aid to Army commanders.

Purpose of the contract, awarded by the Army Signal Corps, is to improve systems of surveillance of a battlefield by radar, infrared, sonic, meteorological, drone reconnaissance, photographic and televisual means. Such information is essential to Army commanders who may operate on battlefields covering thousands of square miles, and employ the devastating weapons of modern warfare.

For example, a profitable target for a guided missile might exist for only a brief period at a distance of hundreds of miles. A commander of the future must be able almost instantly to scan a large battle area, locate and identify a potential target, prepare missile guidance information, launch a missile, and then verify results of a target strike. The smallest tactical units must have a means of knowing what goes on around them and what lies beyond their line of sight.

The study of combat surveillance being undertaken by the Cornell Aeronautical Laboratory is a three-fold task:

1. to evaluate all major programs of combat surveillance within the Department of the Army,
2. to review tactics and techniques in relation to existing and future combat surveillance programs, and
3. to recommend new policies and practices to the U. S. Army Combat Surveillance Agency.

Key personnel involved in the study include 35 scientists and engineers from Cornell Aeronautical Laboratory and about 35 military personnel of the Army Combat Surveillance Agency. The Office for the study will be located in the Washington, D. C., area.

## Army Aviation at Knox

The 64th Transportation Light Helicopter Company and the 544th Transportation Detachment (Cargo Helicopter Field Maintenance) completed a 1000-mile move recently from Fort Hood, Texas to their new station here at Godman Army Air Field. They are the first two helicopter units to be based here.

Equipped with 21 H34 helicopters

and two light reconnaissance helicopters, the units will train as a part of the U. S. Army Armor School and will be attached to the Special Troops Battalion.

Though only three years old, both units have an active record of participation in disaster relief and Army field maneuvers. Activated at Fort Sill, Okla., in 1955, the units participated in Operation Cold Spot in 1956, in Operation Sledgehammer in 1957 and served in a rescue mission to Louisiana in the aftermath of Hurricane Audrey last year.

## Improving Fuel

Army scientists have discovered aviation gasoline improves when stored in pits carved out of ice in the tunnel U. S. Army Engineers have driven into the Arctic Icecap.

The fuel, which evaporates rapidly and takes on other impurities under normal climatic conditions, can be stored indefinitely in the pits under the Icecap. Scientists employed by the Snow, Ice and Permafrost Research Establishment, Wilmette, Ill., a Corps of Engineers laboratory, have found that the fuel retains all of its properties and is improved after an extended storage period.

The tunnel, cut through the Arctic Icecap by the U. S. Army Engineer Arctic Task Force, reached the 1,170 foot mark this past fall. The engineers and scientists attached to the unit have suspended work on the Icecap until next spring. The Task Force has returned to its winter headquarters at Fort Belvoir, Virginia.

## Improved Tank Gunnery

During the months of October, November and December of 1957 approximately 600 tank crewmen of the 2d Armored Cavalry Regiment, recently transferred to Germany, qualified on the difficult tank gunnery Table IV½. This firing was the first use of Table IV½ in the Zone of the Interior. Table IV½ is a difficult subcaliber precision laying exercise designed by Lieutenant General Bruce C. Clarke, Commanding General, Seventh United States Army, for the purpose of improving, within Armor units, the direct firing marksmanship of tank crewmen. Briefly, the course involves boresighting the coax on the M48, a zeroing exercise and finally—the pay-off—firing at 200 yards five rounds of .30 caliber on each of the two rifle "A" targets, alternating targets after each round. To qualify on this table a gunner must place five (5) rounds in each target within a 12 inch bull. Table IV½ is an all or nothing exercise for the minimum qualification score is 100%.



### Film on Trainfire

The Department of the Army announced recently that a new training film titled "Trainfire I" is now being distributed on an Army-wide basis to Signal Corps central and major film exchanges.

"Trainfire I" is a Research and Development film produced in conjunction with the Human Resource Research Organization to show the Army's newly adopted method of training in rifle marksmanship.

The new film points out certain deficiencies in the old method of marksmanship training and shows new procedures that include increased emphasis on 1,000 inch firing; improvised support for the weapon; firing without the sling; half-bull target; Kentucky windage; hold-off method during known distance firing; and the use of ranges from 75-300 yards when firing on the known distance range.

The 20-minute color production stresses the use of combat-type targets and realism. As training progresses, the time of target exposure is shortened. In line with this type of firing, new methods are used to teach range estimation, target detection, and combat firing techniques.

The qualification firing range is situated in an area of varied terrain which the soldier has never seen. Each firing exercise is conducted on a different type of terrain such as level, hilly, wooded, or clear.

### The Pershing Missile

The Army's new solid propellant missile has been named the PERSHING, Secretary of the Army Wilber M. Brucker announced recently.

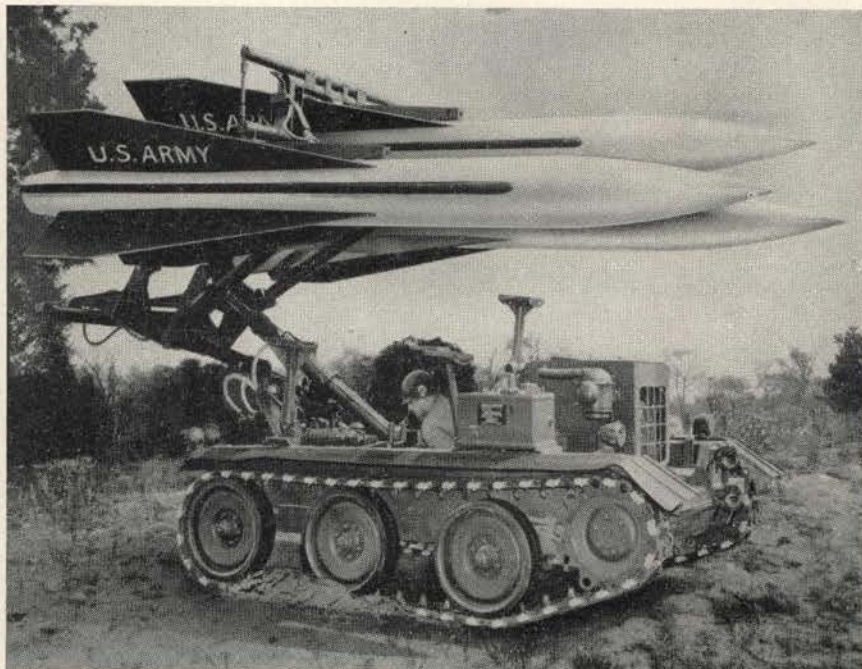
Named after General John J. Pershing, the new missile will soon be under development and will succeed the REDSTONE, as announced recently by Secretary of Defense Neil H. McElroy.

While retaining REDSTONE's mobility, field worthiness and accuracy, PERSHING will be smaller, lighter, and even more mobile. The new missile will provide the Army a more versatile and flexible weapon with which to discharge its role on the future battlefield.

### The Army Finance Journal

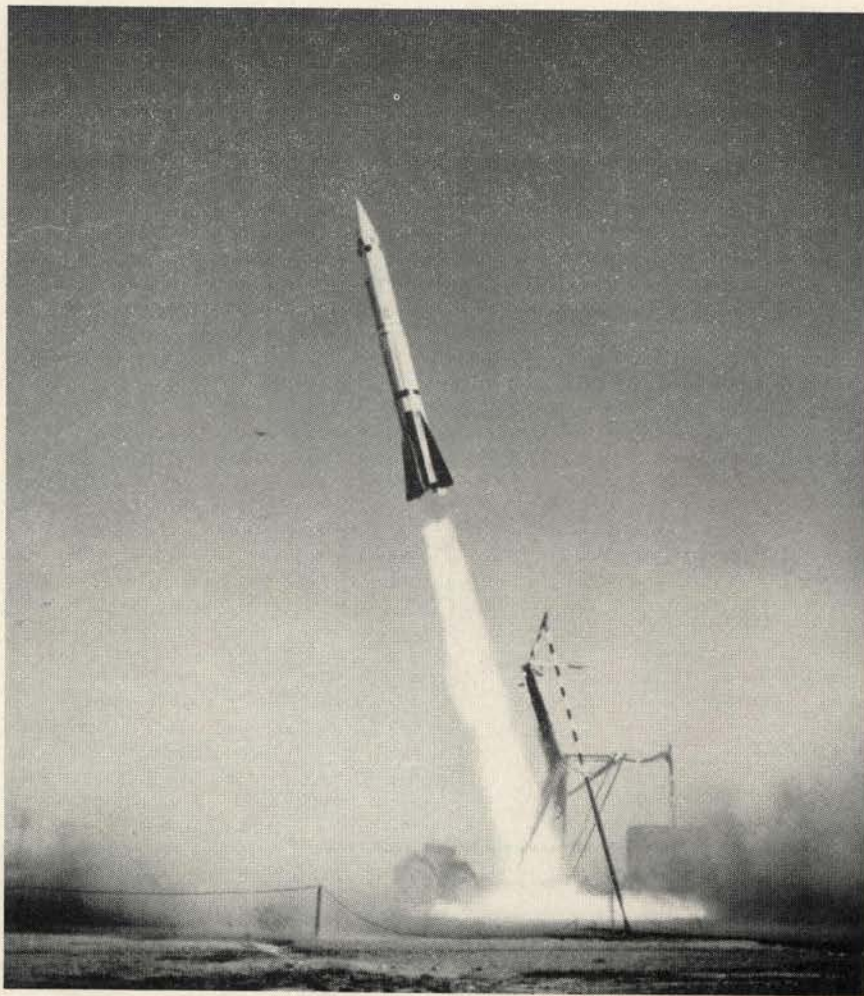
The Army Finance Association took its first tottering steps five short years ago with the publication of a newspaper for its members. During these early days this medium served them well. However, as their Association grew it became apparent that, as one professional association in a field of many, they had to improve on its content and appearance in order to continue a steady growth. This they have done. Volume 1, Number 1 of the new FINANCE JOURNAL, with a completely revised format, now steps into the service journal field. The U. S. Armor Association welcomes the FINANCE JOURNAL, and their association membership into our ranks. Captain George Shepard is the editor.

ARMOR—March-April, 1958



(U. S. Army)

This new self-propelled U. S. Army Hawk missile loader makes it possible to quickly transfer three "birds" at a time from storage area to the launcher.



(U. S. Army)

The Army's new surface-to-surface guided missile blasts off during a recent test flight at the White Sands Proving Ground, N. M. The Sergeant missile can be quickly emplaced and fired under all conditions of weather and terrain.



The 301st Armored Division has been attacking to the east with the mission of seizing an objective approximately 4 miles away. (See Sketch 1.) All three combat commands have been advancing abreast. Air reconnaissance has reported an estimated 30 Aggressor tanks two miles to the east, moving toward the south flank of the center combat command (CCB). The division commander immediately ordered the commander of CCA to move north to support CCB.

At the time the division commander issued this order to CCA, Task Force 1/1 (1st Medium Tank Battalion (Patton), 1st Armor) on the south flank of CCA, had just seized the bridge (643227) over the AUFSES River.

At 121830 August 19\_\_\_\_, the commander of CCA issued the following fragmentary order to the commander of Task Force 1/1. "CCA, minus Task Force 1/1, moves north to support CCB, which is threatened by a large Aggressor force. Your task force will secure the bridge at 643227 until further orders."

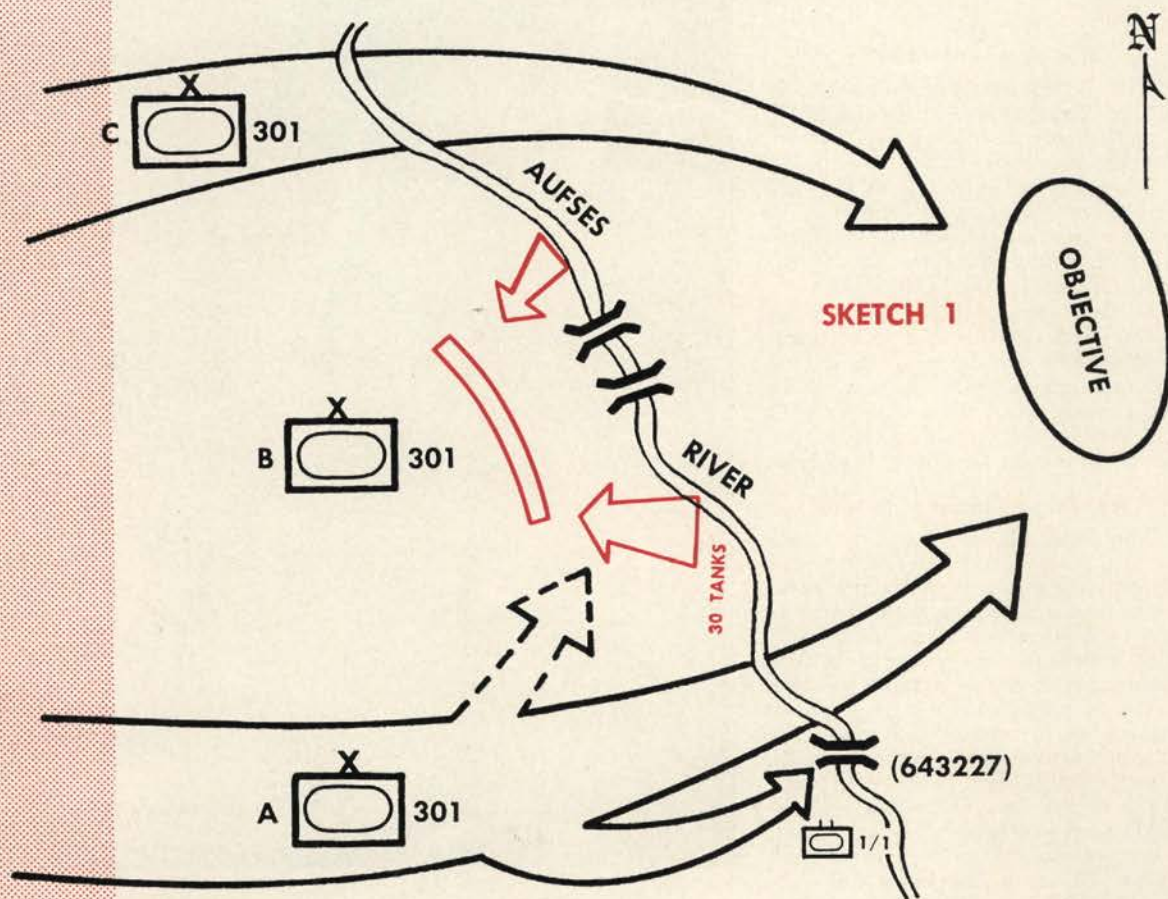


ILLUSTRATION: J H BAIN  
ARMOR—March-April, 1958



## REQUIREMENT NR 1

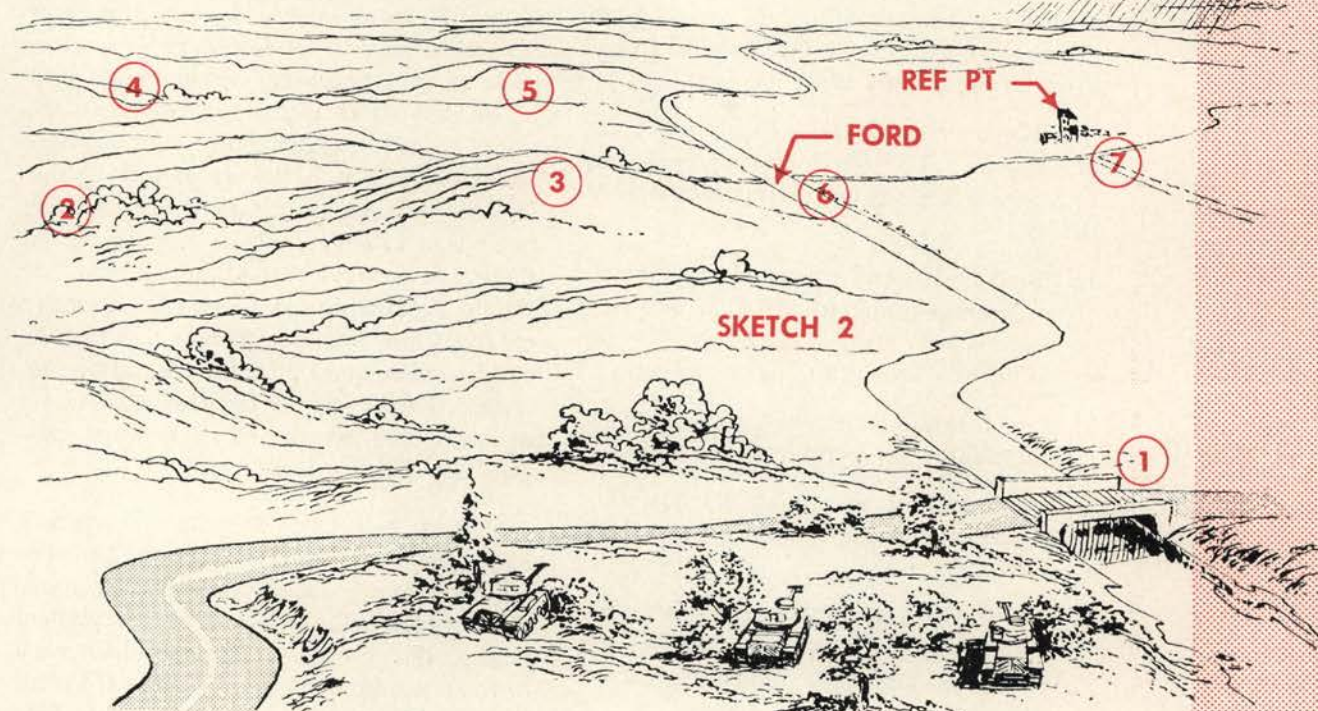
You are the commander of Team A (Company A, 1st Medium Tank Battalion (Patton), 1st Armor), with two rifle platoons attached. The bridge has been secured and night is falling. You are very much concerned with the fire coordination of your unit after dark.

As team commander, what tools and techniques would you use in planning the coordination of fires of your unit? What tools and techniques would you expect your platoon leaders to employ?

## REQUIREMENT NR 2

After positioning his tanks, the leader of the first platoon assigns numbers to probable targets to facilitate fire coordination and target designation. (See Sketch 2.) Each tank crew of the first platoon then completes a range card that covers all probable targets, including avenues of approach, defiles, obstacles, and other terrain features where targets might appear.

The platoon leader then inspects the range cards. What information should have been recorded for each target?



## REQUIREMENT NR 3

After dark a listening post reported a group of about 20 enemy soldiers attempting to improve the ford designated at Target 6 (Sketch 2).

As platoon leader, what command would you give to take the enemy target under fire?

What means of battlefield illumination could the platoon leader have arranged for?

## REQUIREMENT NR 4

You are tank commander of the second tank of the first platoon and have received the command to place fire on Target 6. No battlefield illumination is to be used. Your range card shows a quadrant elevation of -6 and a deflection of 645 left for Target 6.

What command would you give your gunner so as to take the target under fire?



# Solutions

### REQUIREMENT NR 1

The fundamentals involved in night defense by armor units are the same as for daylight defense; however, at night greater emphasis must be placed on prearranged fires and fire coordination. Positive fire control and fire discipline are necessary to prevent premature or indiscriminate firing. Predetermined data must be used.

The team commander should make use of some or all of the following tools and techniques in planning the coordination of fires:

1. Visual and sound communication to all subordinate units to assist in ensuring fire control. (Informal fire orders are issued to platoons to engage targets).
2. Plans for illumination of critical areas by searchlight and pyrotechnic devices.
3. Assignment of sectors of responsibility to each platoon, and plans for necessary supporting fires.
4. Registration on probable targets (depending upon the need for secrecy and on the availability of ammunition).
5. Preparation by all tank and weapon crews of range cards covering all probable target areas. If time permits, range cards should also be prepared so as to permit firing from alternate and supplementary positions.
6. Positioning of tanks so that they can support one another.
7. Prearranged signals.
8. Available infra-red and other electronic devices.

Unless the fire of a tank unit is controlled, the tank crews may expend ammunition carelessly and ineffectively. On the other hand, sufficient fire must be

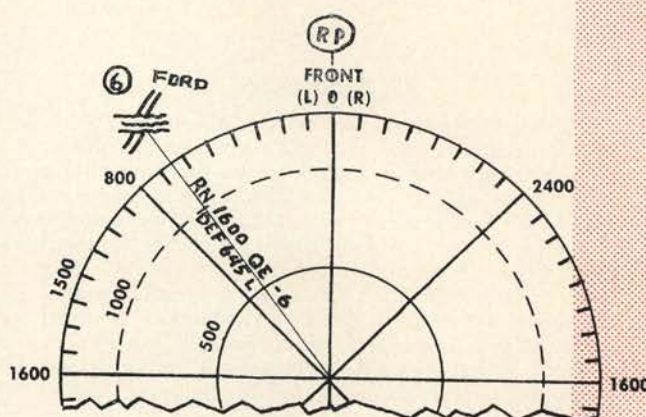
delivered to ensure destruction or neutralization of the target in the shortest possible time. The tank company commander and the platoon leaders must always control the distribution and volume of fire. If supporting units are available to protect its flanks, the tank company concentrates its fire on targets to its front. If supporting units are not available, certain tanks must be designated to watch for targets to the flanks and to the rear. Supporting artillery and mortars should be employed against distant or large area targets, leaving the tanks free to engage closer targets. When there are several important targets, fire should be distributed to engage as many of them as possible. Primary, alternate, and supplementary positions should be prepared. Tanks should be drawn in closer at night and should move to their new positions before dark.

After selecting a primary position, each tank commander selects one or more alternate positions. Supplementary positions are normally selected by the platoon leader. Range cards are prepared for each of these positions. A good range card must be complete, simple, and easily read. Two of the range cards that meet these basic requirements are the *circular* and *sketch* range cards. When observation is poor, tanks may be sited to fire down roads on which enemy tanks might approach. The fires of each platoon and all supporting weapons must be carefully planned and coordinated. As soon as the sector is organized, platoon leaders report the disposition of their platoons to the company commander. Artillery or mortar concentrations are requested to cover likely enemy avenues of approach and to cover any gaps in their front. The platoons' plans are used by the team commander in developing the team fire support plan.



## REQUIREMENT NR 2

A range card is a diagram or sketch of an area showing the tank position, prominent terrain features, and probable target, all in relation to their actual position on the ground. For each target plotted on the range card, four items of information must be shown: target identification, to include a reference point; deflection, which is the azimuth indicator reading from a reference point; quadrant elevation; and range. Example at right shows data for target 6.



## REQUIREMENT NR 3

a. The platoon leader would issue a five element initial fire command such as:

PLATOON  
2 ROUNDS HE\*  
TARGET NUMBER SIX  
TROOPS  
FIRE

b. The platoon leader might have obtained artificial illumination by one or more of the following:

- (1) Flares.
- (2) Tank searchlights (two per tank platoon under ROCAD).
- (3) Mortar fire.
- (4) Artillery fire.
- (5) Air support.
- (6) 60-inch searchlights (eighteen 60-inch searchlights per corps artillery).

\*NOTE: He would designate an amount of ammunition that he thinks would have the desired results on the target area.

## REQUIREMENT NR 4

GUNNER  
HE  
QUADRANT—6  
DEFLECTION 645 LEFT  
TROOPS  
FIRE

The gunner would index the announced elevation on the quadrant, traverse the turret until the announced deflection was indexed, level the leveling vial on the elevation quadrant announce ON THE WAY, and fire.

Detailed information on the technique of firing at night or with poor visibility is found in paragraphs 142-146, FM 17-12, *Tank Gunnery*, dated May 1957.



## 65 Years Ago

The requirements of good cavalry and the best methods of instruction are, no doubt, generally understood by our cavalry officers, but, by some, such knowledge is not possessed, or else unapplied. These appear to understand that a cavalryman is simply a combination of man, horse, arms and equipment, that can be moved rapidly; their only test of good or poor cavalry being whether the combination does or does not hold together at any given time, instead of its constituting a mounted soldier who is capable of performing efficient service, not only by having good use of himself and arms, but who also has perfect control over his horse and knows how, with the least possible fatigue, wear and tear, to obtain the greatest amount of work from him.

In the first case, although the combination might not fly to pieces, and consequently be pronounced good cavalry, a cavalryman might see in the combination an unmanageable horse and helpless rider that, for any mounted service, would not only be worthless, but actually in the way of better trained men and horses.

To train a serviceable cavalryman, the different parts of the combination must first be made ready for assembling, and then put together piece by piece with as much care as would be taken with any piece of mechanism. Good results cannot be obtained in any other way, and the combination when not so made up can at once be detected by a competent instructor.

FIRST LIEUTENANT WILLIAM H. SMITH

*Gaits and Gaiting of Horses*

## 50 Years Ago

The saber is the weapon upon which the cavalry chiefly relies for its distinguishing characteristic, for its essential quality. The chief weapon of the cavalry is the horse. The saber stands for the horse in combat, for the mounted charge, for the shock. There are officers in our cavalry who scorn the thought of being mounted infantry, but think of the mounted charge as a past glory of the cavalry that will never return to it. If their ideas prevail our so-called cavalry is not cavalry. It is no use for it to display crossed sabers, and outshine the infantry and artillery in its uniforms; it is essentially and simply mounted infantry. To be truly cavalry it must believe in the mounted charge as the essential thing. This does not mean that it must consider it as the most important thing. Modern cavalry must expect to fight more on foot than on horseback, to use its rifle perhaps a hundred times where it uses its saber once, but it must be adapted to meet that one case in a hundred, and meet it effectively. Dismounted fighting may be ever so common, ever so important; it is not essential to cavalry. Cavalry can be cavalry without it, but it cannot be cavalry without the ability to fight mounted. The essential difference between cavalry and mounted infantry is that the former can fight mounted while the latter cannot.

MAJOR JOHN BIGELOW, JR.

*The Saber and the Cavalry*

## 25 Years Ago

The surest way to guarantee continued peace for the United States is to develop in the American people a broad knowledge of the facts of our military history, and an appreciation of their true significance. Let them know how close this nation has come to the brink of disaster; in addition to exploiting our triumphs, dwell on the humiliating defeats that we have suffered. Failure to investigate thoroughly our military history, and to apply its teachings, has added to our public debt billions that might otherwise have been devoted to the maintenance of peace. Before, during and after each great national emergency, we have repeated many of the costly errors that could have been avoided had experience been our guide. If our people could but know the truth, it would constrain them to recoil from war until there is, with honor, no alternative. All the peace societies in the world could do no more. Instead of antagonism between students of American military history and those who advocate peace at any price, there should be close cooperation.

It is essential that we know the strength and weaknesses revealed by our past military experience. This experience should be studied, in its proper relation to economic, social and political factors, as an integral part of our national life.

MAJOR C. C. BENSON

*American Military History*

## 10 Years Ago

The enemy's watches must have been pretty well synchronized with our own for just at noon I counted 35 enemy tanks come rolling over a rise in the ground almost to our direct front.

The tank destroyer battalion soon found things too hot for them and they came streaming back. As the enemy fire began to land around us, I ordered the battalion mortar and assault gun platoons, which had been immediately behind the tanks, to take up a position further to the rear. The field artillery battalion that was also in our general area was ordered to displace and took off for a new position.

Our boys, with the exception of one platoon of the right company which, of necessity, was sitting out in the open, were in excellent positions to meet the attack without disclosing their positions until they fired. There was a series of small wadis running at right angles to the direction of the enemy's approach and our tanks were so favorably located and their camouflage so effective that they were difficult to detect until you were right on them.

We held our fire until sure it would be effective and then let the tanks that were in view have it in what amounted to almost a volley. It stopped the attack cold and the enemy was obviously very much surprised to find that they had run into some organized resistance.

COLONEL HENRY E. GARDINER

*We Fought at Kasserine*



# *The Book Section*

The amazing story of March 7,  
1945—the day we crossed the Rhine

## THE **BRIDGE AT REMAGEN**



On March 7, 1945, the Allied free world heard the news of a victory. That afternoon a small group of American infantrymen, engineers and armored soldiers captured the Ludendorff Bridge at Remagen and were across the Rhine. (U. S. Army)

ARMOR—March-April, 1958





## THE AUTHOR

Mr. Ken Hechler received his Ph.D. in Political Science from Columbia University in 1940. Receiving his commission from OCS at Fort Knox in 1943 he remained there to write a history of the Armored Force, which was published serially during the winter of 1943. He became a Combat Historian in Europe and remained there after the War. Returning to civilian life he is now a Lieutenant Colonel in the Active Reserve. Teaching in Princeton University he has been active in political writing and research for Presidents Roosevelt and Truman and Mr. Stevenson. He taught at Marshall College until recently. He now has a weekly Television and Radio show entitled "Comment" at WHTN, Huntington, West Virginia.

**THE BRIDGE AT REMAGEN.** By Ken Hechler. 238 pp. Ballantine Books, New York, New York, \$4.50. (Paperback Edition \$.50.)

Reviewed by  
Major General Harry W. Johnson

**K**EN Hechler has written an excitingly entertaining account of "The Bridge at Remagen," which evidences extensive, painstaking research. We know that success or failure in many military operations is dependent upon the deeds and actions of people we never hear about. In Ken Hechler's book, we hear about these "unknown" people. He has analyzed the many deeds and actions of the people involved in this particular operation, both German and American, from the Supreme Commander down to company, platoon, squad, tank and individual level, with emphasis upon actions at lower levels. He delineates the German weaknesses in command structure, intelligence, communications and logistics. In essence, he gives us a ledger account of pros and cons. Through the study of this account, we begin to understand why this incredibly lucky operation which profoundly changed the course of the war was successful.

As to why the German troops failed to destroy the bridge as ordered, and as to why they failed to contain or destroy the bridgehead, we further examine Hechler's ledger account of

pros and cons. Many contributing factors are evident, factors which the author reveals by chronological and detailed account of orders, actions and deficiencies on the part of the Germans. The two orders which had the greatest effect on developments at Remagen emanated from Hitler's Headquarters. The first was, "to hold out in place to the last man." This order was reinforced in far more stringent terms late in 1944 and made to apply specifically to troops in the West Wall fortifications. Written reports were required whenever such a position was given up, and many courts-martial followed with conspicuous posting of notices naming officers and men executed for "treason." This order scuttled any possibility of conducting a normal, effective withdrawal, delaying action and defense. Compliance with this order meant that when Combat Command B of the 9th Armored Division broke through there were no reserves to fill the gap. Further, it precluded moving troops back to cover the bridge and, lastly, it precluded having sufficient combat

troops east of the river to contain or destroy the bridgehead.

The second order, "that igniters should be attached to demolition charges only at the last moment, and that the orders to prepare a bridge for demolition as well as the orders for the demolition itself must be given in writing by the responsible tactical officer. Further, in areas of more than five miles behind the front lines, only initial preparations should be made; that is, the demolition charges were to be stored in the vicinity." This order had a great psychological effect on the defenders of Remagen. As Ken Hechler put it—it meant: Don't arm those explosives too soon, or it will be somebody's neck. With the quick breakthrough and the rapid advance of Combat Command B upon Remagen, compliance with this order necessitated last minute, frantic, hasty, ineffective demolition operations.

Other factors which contributed to the end result were the constant stream of orders changing the command responsibility for the security and demolition of the bridge. The last such order was issued to a Major Scheller by General Hitzfeld, Commander of the German LXVII Corps, who had been informed at one o'clock on the morning of March 7, 1945 that "Bridgehead Remagen is at once subordinated to LXVII Corps. Strength at Remagen—one battalion and anti-aircraft artillery." Major Scheller's mission: Go to Remagen, establish a narrow bridgehead with forces he could find at Remagen, to find out

*Feature Reviews*

*Exclusive with*

**ARMOR**



## THE REVIEWER

Major General Harry W. Johnson graduated from Bucknell in 1922 and USMA in 1926. Commissioned in the Cavalry he served in various troop positions during the period 1926-37. He was next a tactical instructor at West Point. He spent the War with the 9th Armored Division, rising to the command of Combat Command B. He was the Division Chief of Staff at the seizing of Remagen. Returning Stateside he was AGF G3. He was next the DCS for Administration at EUCOM. He returned to Fort Knox as Director of C&S department. Next he went to Europe as ADC of the 2d Armored. After an assignment with COMZ, USAREUR he was assigned to his present position as Commanding General, U. S. Army Military District, Alabama.



(U. S. Army)

immediately about all the technical features of the Ludendorff Bridge, and to prepare the bridge for demolition if necessary. Considering that Major Scheller was, at the time, 40 miles west of Remagen and that he had never been to Remagen, this tended to be a "large order." Major Scheller arrived at Remagen about 11:15 on the morning of March 7, to find the situation chaotic and with time running out. (Major Scheller was subsequently executed for his "treachery" at Remagen.)

Peremptory actions on the part of higher commanders without coordination with the "tactical commander" at Remagen contributed their bit toward chaos. These actions included remov-

ing battalions which were directed by Army Group Commander Model to be available for the Bridge Security; removing traffic control teams from the Remagen area late in the morning of 7 March; moving 20mm anti-aircraft guns from on top of the Erpeler Ley on the afternoon of 6 March. The best spot in the area from which to cover the bridge and the approaches from the West was unmanned.

German deficiencies which helped to weigh the balance were first, the lack of sufficient troops; second, the absence of a clear-cut command structure in the bridge area proper. The Wehrkreis leader had certain responsibilities, the Bridge Company (Engineers) Commander had certain re-

sponsibilities, the Bridge Security Company Commander had other responsibilities, and many responsibilities were overlapping. Commanders were ordered to cooperate. (It is difficult to conduct a military operation with command vested in a committee.) Other deficiencies were a woeful lack of intelligence at all levels, lack of communications and, finally, a deficiency in quality and amount of explosives supposed to have been available.

The bridge remained standing as a monument to a confused command structure and to the fallacy of highly centralized control.

The efforts of the German forces to contain or destroy the bridgehead



(U. S. Army)

Because of the high priority for moving combat troops and the damage to the flooring of the bridge, it was marked for one-way traffic only—going east.





(U. S. Army)

The control and effectiveness of the Germans in the vicinity of the bridge disintegrated the moment the first American troops reached the east bank. Within 24 hours after its capture 8,000 combat troops formed the expanding bridgehead.

were sporadic, piecemeal and "too little too late." Ken Hechler sums it up nicely with one sentence: "Almost the entire defense of the bridgehead could be explained in terms of small groups of infantry and tanks rushing to put out fires." The blame can be placed squarely upon Hitler's adamant order to hold the Siegfried Line to the last man and not to pull back to the defense line of the Rhine. There were no organized reserves immediately available to throw against the first American troops crossing the bridge. Timing is so important. Initially one battalion could have accomplished a mission which, three days later, was beyond the capabilities of a force of 10,000 combat troops.

The control and effectiveness of the German troops in the immediate vicinity of the bridge disintegrated the moment the first American troops reached the east bank. The first counterattack was launched about midnight of 7-8 March by a "rounded-up" group of about 100 engineers and antiaircraft men. Further efforts to utilize "service type troops" for

counterattack went for naught due to prolonged arguments by high level staff officers as to whether such troops should be so employed. In the first 24 hours after the Americans crossed the bridge, the Germans had approximately 3,000 fighting troops at nearby areas to counterattack along the entire bridgehead perimeter, but by the end of that time they were opposed by approximately 8,000 American troops.

The last major German counterattack effort was made when General Bayerlein took charge "to throw the Americans back to the west bank." After much difficulty, communication and logistic-wise, he massed approximately 10,000 combat troops to launch a counterattack at dusk March 10. This, too, went for naught because by that time the American momentum was such that this force was utilized in brush fire roles, with only local and temporary successes.

At this same time upon the same stage, the Americans were playing their respective parts to the hilt, exploiting the errors in the German cues

and keeping the opposing players off balance. Ken Hechler points out instances of initiative, flexibility and drive exhibited by the Americans from SHAEF Headquarters down to the individual soldier. General Hoge's orders to Combat Command B on the morning of March 7, designating the rate of advance as ten miles an hour, coupled with his previous instructions "to go around resistance, don't get into a fight, by-pass towns and leap-frog units" visualized the optimum in the employment of Armor. The author's narrative from this point until Combat Command B gets a toe hold east of the river, depicts with considerable detail the apprehensions and reactions at all levels. General Hoge, with orders from his Division Commander to push south with all possible speed to link up with the Fourth Armored Division of General Patton's Army, was faced with a soul-searching decision. The decision being made, you are kept constantly aware of the drive and urgency for speed on the part of the Combat Command commander. We feel this drive





An Army observer on "Flak Hill," on the east bank, looks down on "Purple Heart Valley," the bridge still standing. Ten days after its capture it collapsed, but for the Germans it was too late, the final offensive was under way. (U. S. Army)

and urgency being transmitted down through the chain of command to the individual soldier. At the lower echelons we sense keenly the fears, the bravado, yes even the hope that the "damn" thing will fall. They had no desire to be heroes, but each had jobs to do and they were done—admittedly motivated somewhat by the drive of the commander.

Decisions and actions at echelons above the Combat Command were immediate and enthusiastic in approving and supporting the actions of lower echelons. Subsequent orders and actions resulted in the rapid massing of sufficient combat troops in the bridgehead area to assure the collapse of the German defenses on the Rhine.

The natural aftermath of the German debacle at Remagen was to find the scapegoats. The author portrays a sordid picture of the moral disintegration of high ranking German officers. As we sit through the trials of the designated culprits, we realize what a farce German military justice became in the hands of a drum-head

court-martial with its attached execution squad.

Although this is an historical narrative, there is woven into the web of the story a saga of Lieutenant Karl Timmermann and of the company which he commanded, the first company to cross the Bridge. Timmermann was a seasoned veteran of Able Company, 27th Armored Infantry Battalion, having commanded the company's first platoon since Fort Riley days in 1943. He took command of Able Company on the evening of March 6, 1945, the eve of the day of departure for Combat Command B, 9th Armored Division, upon its historical adventure which was to gain fame and honor for many. The story of his life is traced from his birth in Frankfurt, Germany, through his boyhood days in West Point, Nebraska, until his death from cancer in an Army hospital in 1951. Visualizing his pathetic poverty-stricken existence during his formative years, living on the wrong side of the tracks under the shadow of taunts and shame evoked by his father's desertion

during World War I, we understand the growth of Timmermann's burning desire to live down his father's Army record and restore honor to the Timmermann name. This dedication undoubtedly did much to mold his character and to motivate his every action as a combat leader.

We live, fight and cross "the Bridge" with Timmermann and Able Company. We come to know intimately the platoon leaders, the squad leaders, supporting tank commanders, and many of the ordinary G. I.s, including the company characters such as the cooks and the mail orderly, as they unconsciously reveal their fears, loyalties, strength, peculiarities and unit *esprit*. Then, as Hechler brings the picture into focus, we see in this outfit composed of men from all walks of life a good fighting unit commanded by a good combat leader. A unit which is typical of the many thousands of similar units in the American Army in World War II, but also a unit which was fortunate in having an outstanding author select their story as one to be told.



# THE CIVIL WAR

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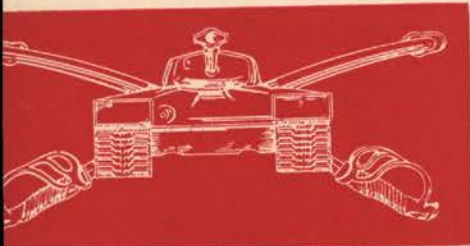




1888

*This issue of ARMOR begins the United States Armor Association's seventy-first year of publishing a professional military journal for dissemination of the arts and science of warfare to its members; covering the mounted . . . mobile and . . . self-propelled fields*

1958





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## **Napoleon's Russian Campaign**

Philippe-Paul de Ségur

*Translated by J. David Townsend*

No great military campaign has stimulated the interest and the imagination of men more than Napoleon's disastrous invasion of Russia in 1812. Among all the accounts of this great event, the Comte de Ségur's has long been one of the most reliable and dramatic.

The Comte de Ségur was born in 1780. As a young man of 19, impoverished by the Revolution, Ségur earned his living writing plays. He was a victim of the frustrations facing his class in the late days of the Revolution when, one day in 1799, he saw Napoleon emerge with a bodyguard of cavalry from the Palais des Tuileries. The glamor of this figure snapped Ségur out of his lethargy, and he decided to become a soldier.

Bonaparte made him a lieutenant, and in a few years the young man rose to be a general and *aide-de-camp* to the Emperor. It was in this capacity that he went on the Russian Campaign of 1812.

*Napoleon's Russian Campaign* begins with the departure of the Grand Army from Paris, but rapidly takes them to the Niemen and the invasion of Russian soil. It follows the campaign closely, with dramatic chapters on the great Battle of Borodino (or the Moscow River), the capture and burning of Moscow, and the tragic retreat.

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*Edited by Bruce Catton*

In his introduction to this book Bruce Catton writes: "One of the genuine classics of Civil War literature is Frank Haskell's account of the battle of Gettysburg . . . Now, at last, it is being made available to all.

"It is valuable in two ways. First of all, this Union officer was on the staff of the division commander who held the precise part of the Federal line against which was directed the most famous military assault in American history, Pickett's charge. During all of it, he was in the exact storm center; and in this account, with the heat of battle still on him he tells just what happened there, under the smoke that must always dim the sight of later generations."

Mr. Catton goes on to point out that Lieutenant Haskell had "the talent to convey the look and the sound and the feel of what he had been through . . . Any visitor to the stone wall . . . on Cemetery Ridge is bound to find himself musing . . . What was it really like up here then? As far as the question can ever be answered for one who was not there, Haskell answers it."

Here is the climactic moment of the war written down within two weeks of the events it describes. The author was later to be killed at that other terrible battle, Cold Harbor, but he left behind him a piece of true literature which hurries a reader's pulse a hundred years after the smoke of Gettysburg has subsided.

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