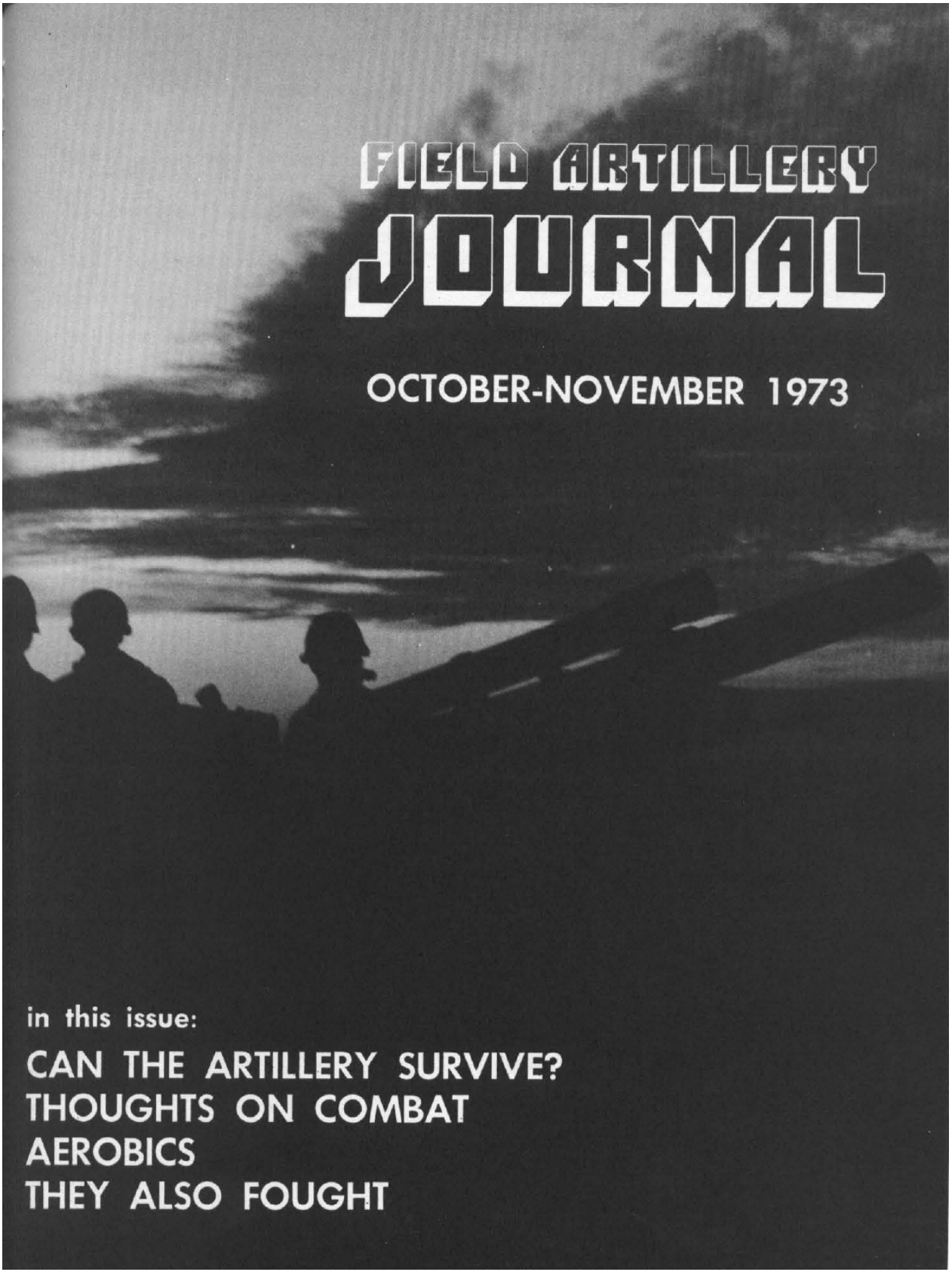


FIELD ARTILLERY JOURNAL

OCTOBER-NOVEMBER 1973

in this issue:

From the Editor:

I am happy to report that progress is being made toward the goal of becoming a bimonthly periodical. We have been authorized to print the last three issues of FY 74 commercially. This will allow an expanded use of color and permit us to use paper of a higher quality. We have also received permission to increase our staff; this increased staff will enable us to better serve field artillerymen worldwide.

DISTRIBUTION

We have received a great many mailers from the July issue requesting increases in distribution, which we are processing. Several people have asked to be placed on our mailing list by name; however, as indicated on page 46 of the July issue, we are not allowed to make free distribution to individuals. We have forwarded these requests to the Fort Sill Book Store, and those requesting individual distribution will receive subscription forms to complete if desired.

ABOUT THIS ISSUE

As you will see, this issue includes two historical articles. Major Robert Dalton has an interesting article, *They Also Fought,* dealing with black participation in World War I. A recent change adding a writing project to the Advance Correspondence Course curriculum brought about the second article. LT Philip E. Meyer of the Iowa National Guard was one of the first to submit a paper under this requirement. His excellent article *The Duke of Marlborough* is included in this issue. We might add that LT Meyer is a PhD candidate at the University of Iowa.

Also included in this issue is the first in a series of humor articles written by a retired British officer under the nom de plume, T^2. We think you will enjoy his article *Notes for Young Conferees* as well as the others we will publish in later issues.

An old subject, physical fitness, is given new treatment by CPT Robert Tetu in his article *Aerobics*.

LTC William Wood (Ret) has provided some excellent rationale for a multirail rocket system in his article *Can the Artillery Survive?*

Major Ken Ingram has written a proposal to return to aiming posts with some modifications.

Our present air defense doctrine is challenged by CPT Robert Kimball, who advocates a more active role for the field artillery.

Rounding out the major articles of this issue is an essay, entitled *Thoughts on Combat,* by LTC George Wallace that deals with the subject of leadership under battlefield conditions.

Our standard features, Firing the Corps, Right by Piece, and View from the Blockhouse, are also included. The enlisted page, Trooping the Line, will appear in the next issue and will include a proposal for revising the 13-series MOS career field.

CONTRIBUTIONS FROM THE FIELD

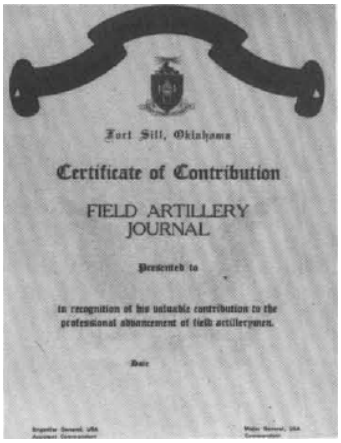
Although we have received many favorable calls from the field on the July issue, the written comments have been somewhat scarce as indicated by the Incoming page. We would like to point out that we need to hear from you to insure that the **Journal** is conforming to your desires.

CONTRIBUTING AUTHORS

Each author who submits an article that is published in the **Journal** receives a certificate of contribution (see picture), signed by the Commandant and the Assistant Commandant of the Field Artillery School, as well as a letter of transmittal signed by the Commandant. A copy of the letter may be forwarded to the Field Artillery Branch to be included in the contributing author's 201 file.

The upshot is this: By contributing an article to the **Journal,** you do yourself a favor, you support your branch periodical, and you give other field artillerymen the benefit of your experience and expertise.

Editor



Fort Sill, Oklahoma

Certificate of Contribution

FIELD ARTILLERY JOURNAL

Presented to

in recognition of his valuable contribution to the professional advancement of field artillerymen.

Date

CONTENTS

Volume 41 **Number 2**

● ARTICLES

● FEATURES

ABOUT THE COVER
We salute the 105-mm howitzer, workhorse of the field artillery since the 1930's.

INCOMING

Letters to the Editor

Dear Sirs:

Bravo! At long last we have become unshackled from the *FIELD ARTILLERYMAN*. I missed the October 1972 issue, in which you solicited ideas for the establishment of a journal, but I have enclosed copies of my correspondence and the school's reply of early 1972 for your records and posterity.

Needless to say, I was delighted to receive a copy of the July **Field Artillery Journal,** and would like to enter my subscription so I may continue to receive it.

I wish you the best in your efforts, and I hope that the new **Journal** will achieve and maintain the high standards that earmarked the old **Field Artillery Journal.**

Sincerely Yours,
ROBERT S. BALLAGH, JR.
Captain, Field Artillery
West Point, NY

Editor:

The Republic of Vietnam National Defense College Library is very much interested in receiving on a continuing basis the FIELD ARTILLERY JOURNAL.

We will appreciate it if you will include the National Defense College Library on your mailing list.

Sincerely,
LT HOANG NGOC HUU
Chief Librarian

Editor:

Will you please be kind enough to place this organization on your complimentary mailing list to receive copies of your post newspaper and your publication, *Field Artillery Journal?*

HumRRO is a contract R&D agency of the Army, operating under contract DAHC-19-74-C-0004.

Thank you for the kind attention I am certain this request will receive.

Sincerely yours,
SAUL LAVISKY
Executive Officer

Dear Sir:

Request you send copies of the Field Artillery Journal and its predecessor, for the past two years, to this office.

This office is newly formed and lacks copies of the Journal. We believe that the back issues will aid us considerably in the performance of our duties.

ALAN L. PHELPS
Major, FA
Readiness Group Lee
Fort Lee, VA

THE FIELD ARTILLERY SCHOOL

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The new **Field Artillery Journal** is published for the same reasons stated in the first Field Artillery Journal in 1910:

The publishing of a Journal for disseminating professional knowledge and furnishing information as to the field artillery's progress, development, and best use in campaign; to cultivate with the other arms, a common understanding of the powers and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country.

Opinions expressed by the authors are their own and do not reflect the opinions of the Department of the Army or The Field Artillery School. Articles or letters should be addressed to: Commandant, US Army Field Artillery School, ATTN: ATSFA-AW, Fort Sill, OK 73503. Requests for subscriptions should be addressed to: Commandant, US Army Field Artillery School, ATTN: Bookstore, Fort Sill, OK 73503.

RIGHT BY PIECE

ARTILLERY RAID

As dawn painted the frozen peaks of the distant Alaska Range in hues of pink, the helicopter set down in a swirl of rotor-blown snow, disgorged its four-passenger advance party, and took off again to orbit a few miles away. The pattern was repeated by a CH-54 Sky Crane which released a 155-mm howitzer and a sling load of ammunition. Next came a CH-47 "Chinook" with the gun crew, an infantry squad, and a Redeye team. Overhead, the sound of rotor blades slicing the air continued as three accompanying Cobra gunships orbited the area to provide security.

Within minutes, the first round was on the way, followed in short order by the remainder of the shells allotted for the fire mission.

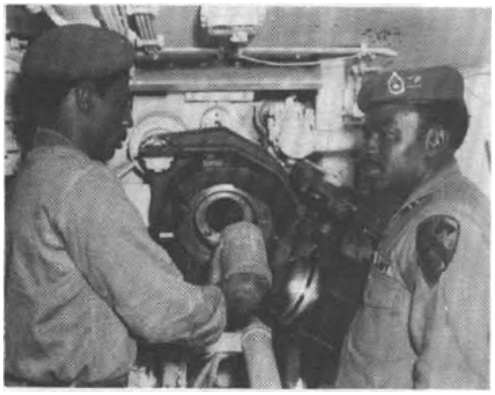
This concept has been developed and used successfully by Alaska-based artillerymen of the 1st Battalion, 37th Field Artillery, 172d Arctic Light Infantry Brigade.

Lieutenant Colonel Roland A. Bracewell, the artillery battalion commander, coordinated with the commander of the 222d Aviation Battalion to test the single-gun airmobile artillery raid concept during the Alaskan Command's joint exercise, ACE CARD V. Once the firing position is pinpointed, firing data is developed for all targets and a fire plan is prepared. Coordination is made with the Army aviation element helilift and with the FSE concerning the flight paths, LZ, raid time, and other details of the raid plan.

THANKS FOR THE BLANKS

When you're fighting your own army you cannot use live ammunition.

So it was with the 1st Battalion, 6th Field Artillery, 1st Cavalry Division at Fort Hood, Texas, during participation in the MASSTER Tests.



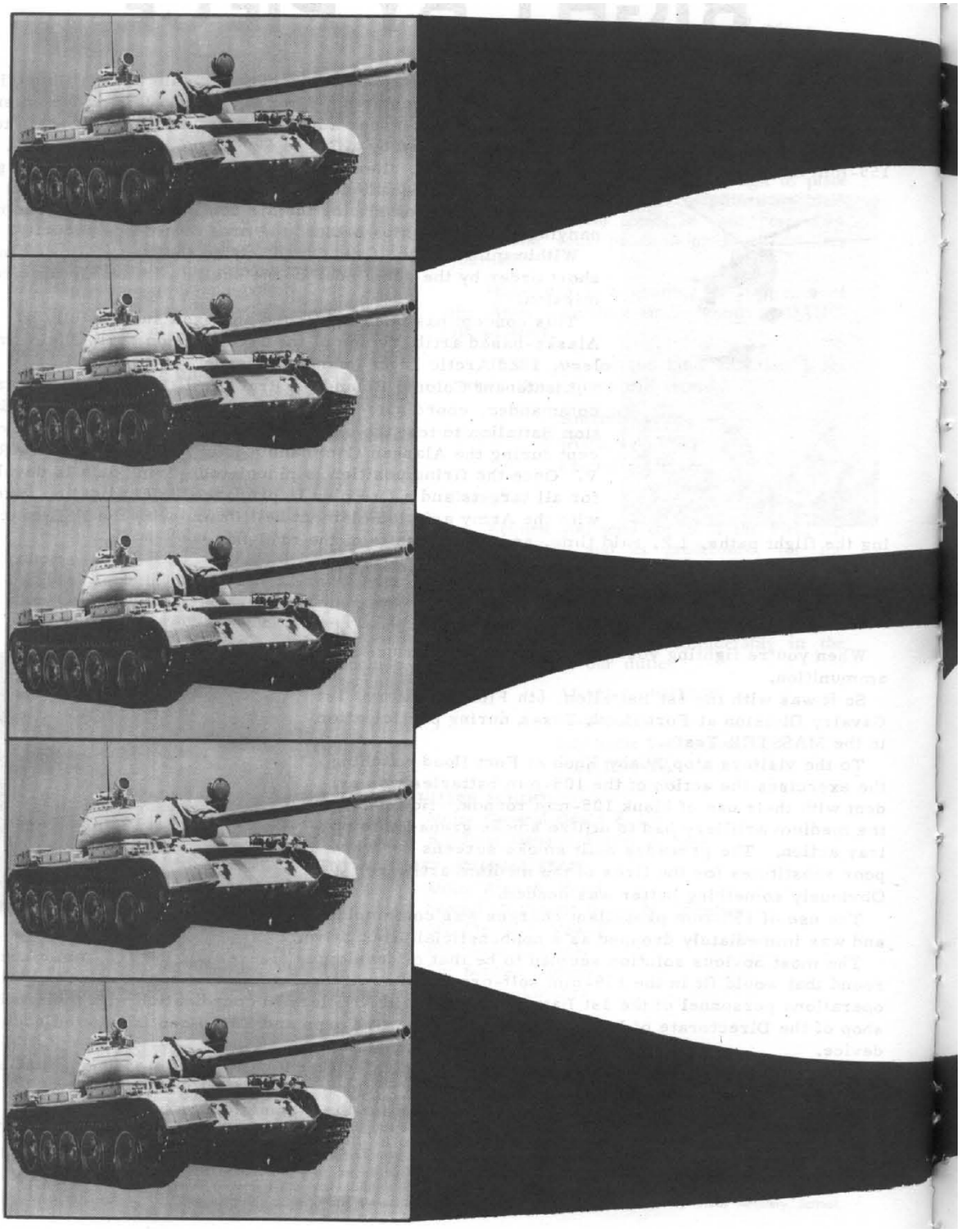
To the visitors atop Bushy Knob at Fort Hood watching the exercises the action of the 105-mm batteries was evident with their use of blank 105-mm rounds. However, the medium artillery had to utilize smoke grenades to portray action. The grenades built smoke screens but were poor substitutes for the fires of the medium artillery. Obviously something better was needed.

The use of 155-mm propellant charges was contemplated and was immediately dropped as a nonbeneficial alternative.

The most obvious solution seemed to be that of developing sleeves for the 105-mm blank round that would fit in the 155-mm self-propelled howitzers. With this goal outlined, the operations personnel of the 1st Battalion, 6th Field Artillery in coordination with the machine shop of the Directorate of Industrial Engineering, III Corps and Fort Hood fabricated such a device.

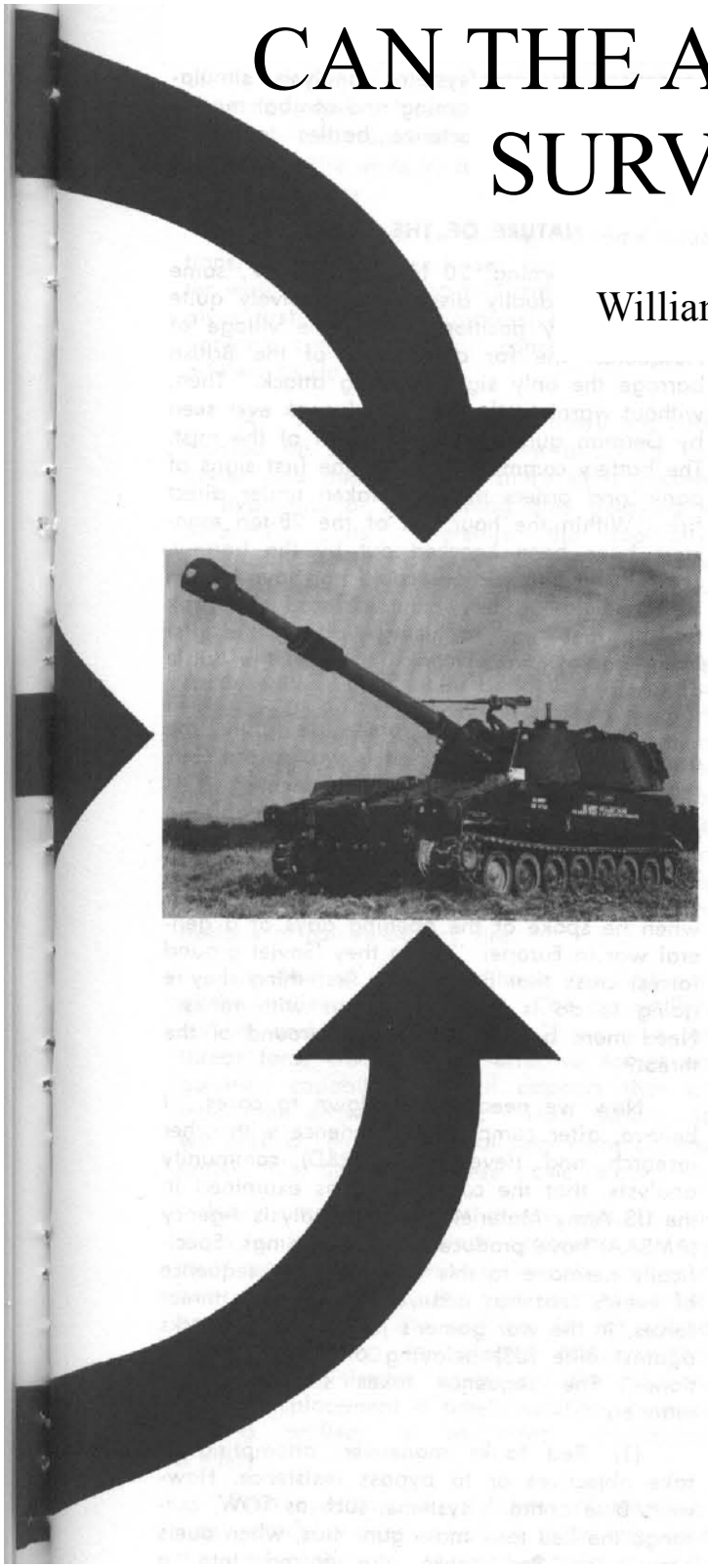
Experimentation with the new blank adapter indicated that it remained in position, stationary within the howitzer chamber and repeated rounds could be fired with 100% reliability.

The 1st Battalion, 6th Field Artillery has plans for the fabrication and use of the blank adapter. Those units desiring more information should write to the 1st Battalion, 6th Field Artillery, 1st Cavalry Division, Fort Hood, Texas 76544.



CAN THE ARTILLERY SURVIVE?

by
William J. Wood



"It is with artillery that war is made" --Napoleon

Beautifully profound, this statement. Although I admire Napoleon, my doubts about our present ability to sustain the meaning of the statement have prompted the thoughts which follow.

First among these reflections has been the question: What really significant advances have there been in nonnuclear artillery capabilities since World War II? When this question was posed to groups of senior artillerymen, there was sincere soul searching (sometimes, alas, to the accompaniment of drumming provided by a few breast beaters) until the answer appeared: None. Further, the last quantum jump seems to have been the development of massed fire techniques, including fire direction and forward observer procedures, which was made in the early 1940's.

It is not my intent to either attack or defend such a conclusion but rather to define a far greater challenge, one of the greatest the field artillery has had to face in the 20th century. More in a moment, but first the boundaries of the discussion must be delineated.

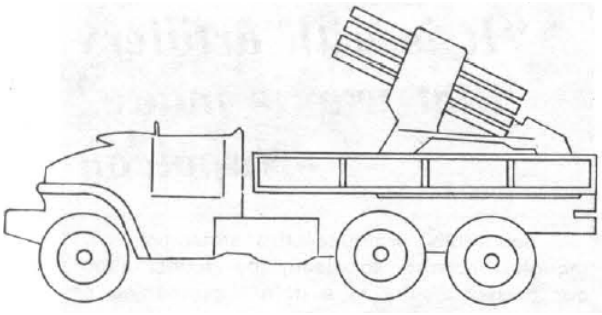
The response recommended is, of necessity, a revolutionary one. If a reader is committed of the idea that all change should be evolutionary, he need not read further.

The problem addressed is solely within the context of the threat to be encountered in a general, mid-intensity war in Western Europe.

The conclusions reached concerning the nature of the threat have been generated within a common bond experience acquired in operations research/systems analysis simulations—such as war gaming and combat modeling—that will characterize battles in future armored warfare.

NATURE OF THE THREAT

Early morning, 20 November 1917, some light fog gradually dispersing, relatively quite in the battery position outside the village of Flesqueres, the far off rumble of the British barrage the only sign of a big attack. Then, without warning, the first British tank ever seen by German guncrews lumbers out of the mist. The battery commander quiets the first signs of panic and orders the tank taken under direct fire. Within the hour, six of the 28-ton monsters have been knocked out by the battery. Though the gun sections could not have known it, the field artillery cannon faced the tank for the first time in history—during the first mass employment of tanks, there in the Battle of Cambrai.



Concept of possible rocket system.

Today, and for the forseeable future, the armored threat is as real at is was to the German battery commander; now, however, it is of a nature and magnitude inconceivable in World War I. The essence of today's threat was succinctly expressed by General James H. Polk, USAREUR Commander from 1967 to 1971, when he spoke of the opening days of a general war in Europe: "When they (Soviet ground forces) cross that border, the first thing they're going to do is gang up on us with tanks." Need more be said of the background of the threat?

"When they (Soviets) cross the border, the first thing they are going to do is gang upon us with tanks."

Now we need to get down to cases. I believe, after comparing experience with other research and development (R&D) community analysts, that the combat actions examined in the US Army Materiel Systems Analysis Agency (AMSAA) have produced typical findings. Specifically germane to this inquiry is the sequence of events that has occurred during Red (threat forces, in the war gamer's jargon) main attacks against Blue (US) delaying or defensive positions. The sequence takes shape in this manner:

(1) Red tanks maneuver, attempting to take objectives or to bypass resistence. However, Blue antitank systems, such as TOW, outrange the Red tank main gun; thus, when duels occur, the Red tanks are forced into a "standoff."

(2) In order to accomplish their missions, Red units must continue to fire and maneuver; to do so, they must close within effective range of the main gun. In trying to close, Red tank units have heavy losses, often in unacceptable numbers—unacceptable unless Red is willing to sacrifice entire units in order to close with and overwhelm Blue.

(3) Red might be willing, in some situations, to accept severe losses, but he has a better way out. If, during this critical period, Red gives first priority to suppressive fires on Blue antitank systems, he can concentrate enough artillery to do the job.

(4) When sufficient Red artillery has been massed on Blue positions, the attacking Red armor and mechanized infantry units succeed in bypassing or overrunning Blue delaying or defending units. Therefore, the qualitative superiority of our antitank systems has been nullified when they have been suppressed by the enemy's artillery.

This sad fact is not the end of the story. Because Red can usually build up a quantitative superiority in the cannon artillery supporting main efforts—on an order of anywhere from 2 to 1 up to 4 to 1—he can afford to deliver counterbattery fires on our artillery at the same time he is delivering other suppressive fires. In addition, it is evident that, when Red chooses, he can concentrate his artillery on ours, bringing down overwhelming concentrations of counterbattery fire.

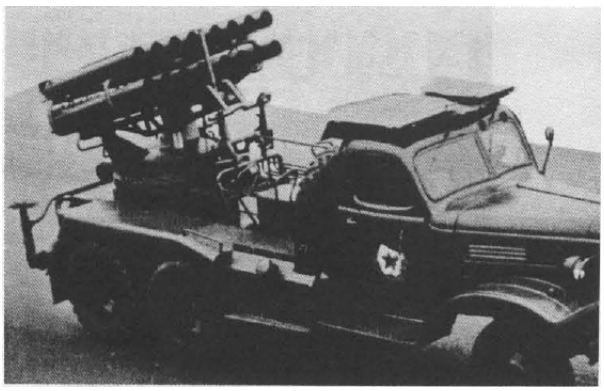
In view of these conditions, the first part of the challenge is presented: Can our artillery survive and still do its job? If we give the threat force credit for an effective target acquisition capability—and it appears that we must—the answer is: No. Then where do we seek a solution—in building more cannon units? No, again, for these basic reasons:

Every time one of our pieces fires, it provides a signature. Since cannon artillery must remain in position to fire, the longer a battery is in position, the more lucrative a target it becomes. The problem is not solved solely by digging, for effective counterbattery fire, as a minimum, neutralizes the position. Nor is displacement a timely solution, because moving artillery is, in effect, neutralized artillery.

Even operating on the best of displacement schedules does not allow us to overcome the urgent need to support maneuver units during critical phases while, concurrently, we

"But the consideration is, whether for the general service, the power of quantity in the fire of Rockets does not at least counterbalance the greater accuracy of the gun."

Congreve 1812



Russian 150mm Rocket Launcher.

must suppress enemy artillery. Gaining even a quantitative parity in order to meet this discrepancy means a major effort for us. Does this mean we **must** gain in quantity? Yes, but we must take into account another aspect.

We will have an extremely difficult—if not impossible—task in selling the case for a great increase in cannon units, particularly in light of the high cost of the self-propelled monsters we now have in our armored and mechanized division artilleries.

LIGHT AT THE END OF THE TUNNEL

Up to this point, we have been viewing an ever drearier picture. There might be several ways out of the dilemma, but we should seek one that will balance an adequate answer with a reasonable cost. There is a viable candidate in a multirail launcher system. If such a system is to meet the requirements that cannon cannot, what characteristics and capabilities must it have?

In order to mass-produce the weapon in the quantities we shall need, it must be made cheaply. This must be done at a highly significant reduction in the comparative cost of cannon.

Also, if it is to be produced cheaply, it must be kept simple. We cannot afford to haggle over all sorts of "improved" gadgetry and lose sight of our goals by trying to develop some superweapon.

Next, it must be rugged and highly mobile so that it can occupy position, march order, and move rapidly. Again, simplicity is a key word. A truck mount similar to that of the Honest John appears adequate. We shouldn't get wrapped around the axle in going after some nice-to-have cross-country mobility. In Europe (or anywhere, for that matter, where there are usable roads) the weapon can pull off the road for a few meters, fire, and get out of there.

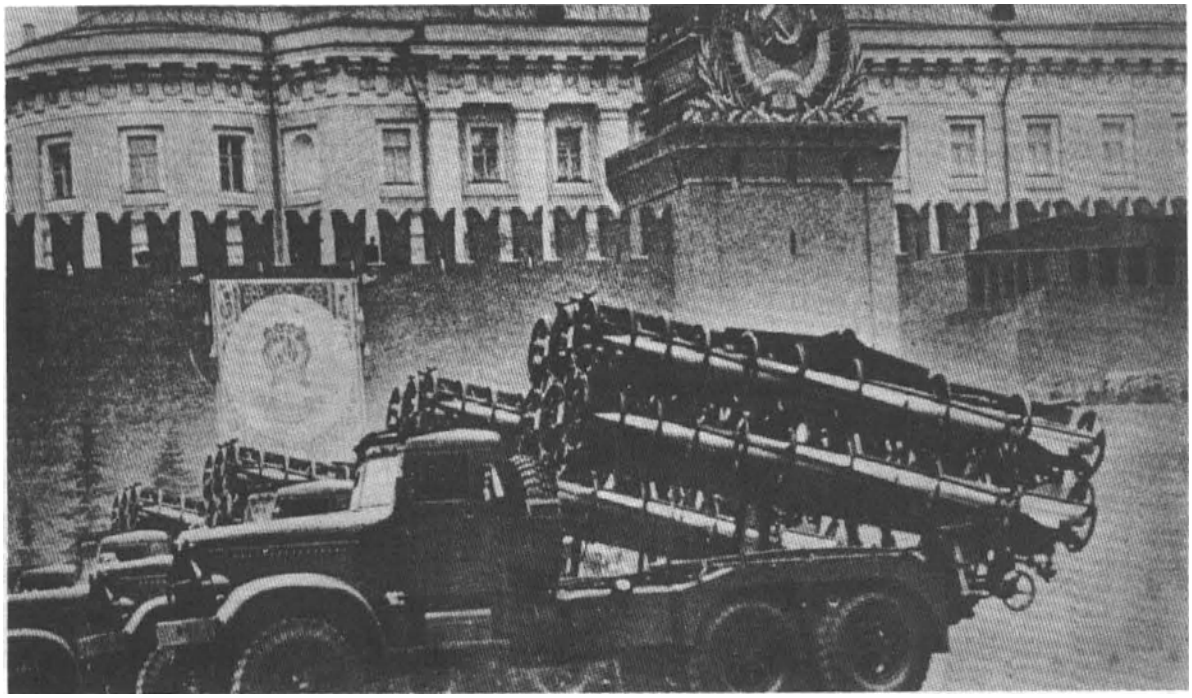
The system must be capable of delivering either a single round or great densities of fire on short order. This is inherent in a multirail launcher—there are available single tubes or a built-in TOT.

To be responsive to any type of fire request, the system must be versatile in its capability to attack a variety of targets—hard as well as soft. For these purposes, at least three types of warheads should be considered:

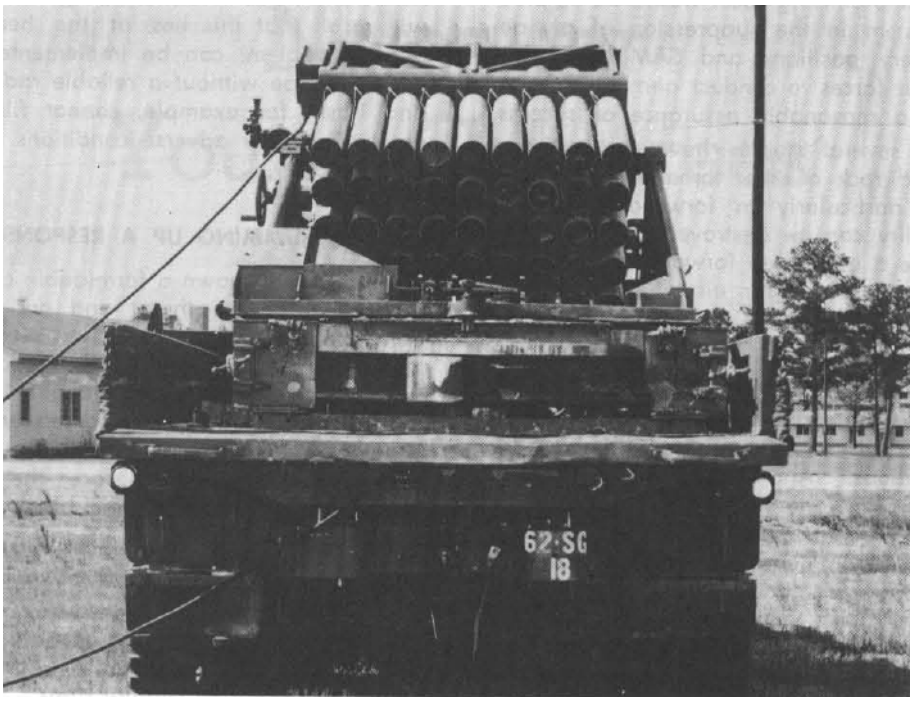
(1) A rocket counterpart of the cannon-launched guided projectile (CLGP). A spin-stabilized rocket can be made with sufficient accuracy to enable the observer to catch it in his "basket." Thus, we will have an effective antiarmor capability.

(2) A HE round with current type fuzing.

(3) An improved conventional munition (ICM) warhead for attacking soft targets. In this respect we get a real break, since all threat



Russian Truckmounted 6-round rocket launcher.



M91 Rocket Launcher—an early US approach to a multiple rocket system.

force cannon artillery are towed systems and thus the battery personnel, particularly in fluid armored warfare, are highly vulnerable target elements. In addition, if the enemy infantry soldiers dismount from their APC's to assist the maneuver of tanks, we can fire a combination of warheads to defeat both infantry and tanks.

Finally, the system must have an adequate maximum range, say from 30 to 40 kilometers. Basically, the reasons are: First, to permit the launchers to operate freely at depths beyond the range of the enemy's light artillery and—if possible—medium artillery; second, to allow the weapon selectivity of position in order to fire concentrations in front of maneuver elements; third, to enable the system to reach such targets as SAM sites in the depths of the threat division zones.

ORGANIZATION AND TACTICAL EMPLOYMENT

Shouldn't tactics dictate organization? Optimistically, yes, but let us consider the two concurrently. The organization, like the weapon, should be simple. Conceivably, batteries of six or eight launchers would be acceptable at both division and corps artillery levels. Whether batteries are employed as separate units or within a battalion structure is an area for study. In any case, wherever practicable, such functions as target acquisition, survey, and, possibly, ammunition resupply should be performed above battery level. Only the capability to fire, displace rapidly, and communicate need be retained by the battery.

If we are to be truly flexible in proliferating our side of the battle field with artillery units, we must be capable of employing launchers individually (ideal for CLGP-type missions), by platoons of two or three launchers, or by battery.

If flexibility of employment is necessarily a paramount consideration, shoot-and-scoot (a dirty phrase to one school of thought) is one way to face up to the problem of artillery survivability. Since it has become apparent that cannon artillery cannot stay in position to survive and shoot as fire units, then we must devise tactics that insure our ability to maintain a constant balance of fire and movement. This we can do with an adequate amount of launcher artillery.

In maintaining the requisite balance, we should look to frequent and short displacements—often on the order of only a few hundred meters. The objection might be raised that frequent artillery movements could tie up the road net needed by maneuver units. Not necessarily so. In Western Europe there is a plenitude of secondary roads and trails that can be exploited by artillery for this purpose.

Another promising facet would be employing the system in the suppression of air defense artillery positions and SAM sites, thus enabling our forces to conduct airmobile operations with a reasonable assurance of success. Heretofore, several studies have run aground on the hard rock of the threat force's ADA capability, particularly in forward areas. If this capability can be destroyed or neutralized we can take a giant step forward in creating a favorable atmosphere for airmobile operations in Europe.

Finally, we must address the technical problems that are inseparable from the tactical. Uppermost is that of **timely** target acquisition—the specter that has haunted artillerymen for two generations. And this ghost is one that puts in full time; he never goes away. The field artillery team position on the matter, along with recommended organizational and equipment changes, goes a long way toward workable solutions. However, within the concept and context of this discussion, one item deserves special attention: To date we have never fielded an adequate counterbattery radar. No effective counterbattery program (the reader will recall that this lies at the heart of the overall problem) can be implemented in combat in Europe without a reliable radar. Sound and flash, for example, cannot fill the gap, especially under adverse conditions of weather and visibility.

SUMMING UP A RESPONSE

You were shown a formidable challenge in the nature of the threat and our current inability to counter it. There is a second half of the challenge that is equally important, and that is to our flexibility of thought. We cannot continue to rest on past laurels, namely the honor of being the greatest killer on the battlefield—in fact, we now face the somewhat unpleasant prospect of being blown off it.

Rigidity of thought is no less a danger than the threat itself, and the problem ignored will not disappear. Either we come up with a sound response, or the field artillery may do something it has never done in the past: let down the supported combat arms.

William J. Wood retired as a Lieutenant Colonel at Fort Sill in 1958 after 23 years service. He saw combat in five campaigns during World War II and two campaigns in Korea.

In 1954 he worked as a research officer at Fort Sill becoming a research analyst after ***he*** *retired from the Army. In 1964 he became Threat Intelligence Analyst for the Field Artillery School. In 1968 he began his present duties with the Tactical Operation Analysis Agency, Aberdeen Proving Ground, Maryland*.

Notes for Young Conferees

By "T^2"

This article has been reproduced from the British Army Review *by permission of the Controller, Her Majesty's Stationery Office. It is the first in a series of articles by "T^2" which we will be reprinting. In response to a query for biographical information we were told that T^2 was a regular Major in the Durham Light Infantry and saw service in the Far East. He now works for the Civil Service, is married and lives at Goring on Thames. A member of the British Army Staff said of T^2 and his work, "Behind the humor there is a great deal of perception. I think all countries and professions need a man like him somewhere in their organization to make us laugh at ourselves." We concur.*

The Conference is a military institution in which all officers at one time or another find themselves involved. Yet, there appears to be no instruction available in training manuals on the art and practice of conferring. This article aims to fill this obvious gap in the education of officers.

THE PRINCIPLES OF CONFERRING

The object of having a Conference is to avoid making a decision. Just as in the days of ancient armies a Council of War was called only when the General did not wish to attack the enemy, so, today, a conference is called only when a Commander or his staff do not wish to take a decision. If they wished to decide something, they would simply decide it, or if they wished to act, they would act. If they required someone else's views beforehand, it is simple to pick up a telephone and ask. The whole purpose in having a conference is to delay, and, if possible, avoid such decision or action. A further aim, of course, is to provide an excuse for inactivity, and to spread any censure over as many individuals and branches as possible.

The more people there are present, the easier it is to come to no decision, but conversely the longer it takes to achieve this. The number of people invited to attend needs careful consideration. If too few are asked, it will be very difficult to avoid deciding something. If too many attend, the whole day, or even days may be spent in the process, and it might be considered easier in the long run to abandon the aim, and actually make a decision.

A conference should be attended by the most senior and distinguished officers available, regardless of whether they know anything about the subject under discussion. The important thing is that they should be seen to be present, thus advertizing the importance their branch or department attaches to the decision which is not going to be taken. (In the unlikely event of any real knowledge being called for, it is permissible for a junior staff officer to be taken along as an advisor. Usually he will be so afraid of contradicting his own chief that he will remain mute throughout the proceedings).

No conference is complete without tea or coffee. This is a ritual which must be observed without fail. Either the meeting must be summoned at least half an hour before it is due to begin, in order that the participants may consume an adequate quantity first, or proceedings must be adjourned just after they have begun, while some minion clatters around with a tray and cups. Biscuits are optional.

THE DUTIES OF CONFEREES

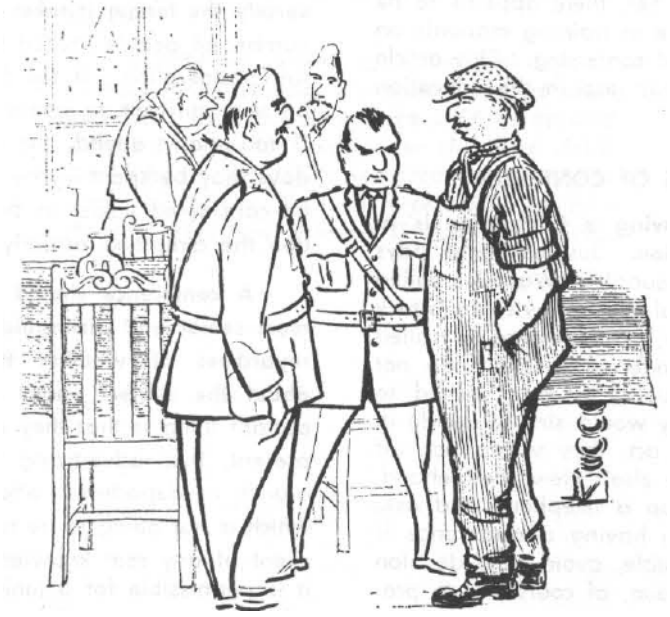
Bright Young Fanatics. It is as a BYF that an officer often makes his first appearance at a conference. Thinking his brilliance and enthusiasm unique, he is surprised to find that BYFs tend to come in pairs. One is normally the originator of the project under discussion, and is fervently convinced of the correct solution. The other is provided by the conference organizers to balance the first, and to ensure that the meeting cannot be stampeded into agreement. Both fanatics talk at such great length and interrupt each other and everyone else so persistently that all the other attenders become thoroughly irritated with both. It then becomes relatively easy for all to agree to leave the problem unresolved, or, at the least, to postpone any decision until another conference has been arranged.

Technical Expert. In this new scientifically-conscious Army, no conference is allowed without the presence of a technical expert, either a technical staff officer or a civilian scientist. If the conference seems in danger of coming to a decision, he is at once invited to speak. He promptly delivers a long incomprehensible lecture, illustrated by complicated graphs, slides, wall charts, etc. All other conferees lapse into coma, and all risk of a decision at once disappears.

Wrong Conferee. There is often one member who is, in fact, at the wrong conference, but, as his interventions are no more irrelevant than many others, neither he nor the other members realize this. It is normally possible for him to leave at the end convinced that he attended the right meeting.

Branch or Department Representatives. Normally these know nothing about the subject under discussion, nor have any interest in it. They are present solely to show that their branch or department is so important that it must be represented. They intervene in discussion whenever they see a chance to plug the party line of their branch. Research suggests that many branches keep one officer permanently on duty as a Conference Representative, with the responsibility of selling his branch's latest policy to as wide an audience as possible.

Financial Wizard. One of these appears at every conference. No one knows where they come from, and certainly no one ever invites them. He sits silent throughout proceedings apparently reading the "Financial Times". He



"There is often one member who is, in fact, at the wrong conference"……."

Financial Wizard: One of these appears at every conference.

only speaks if one of the fanatics succeeds in convincing the other that he is right and it looks as if a decision is becoming inevitable. The Financial Wizard then points out in two crisp sentences that:

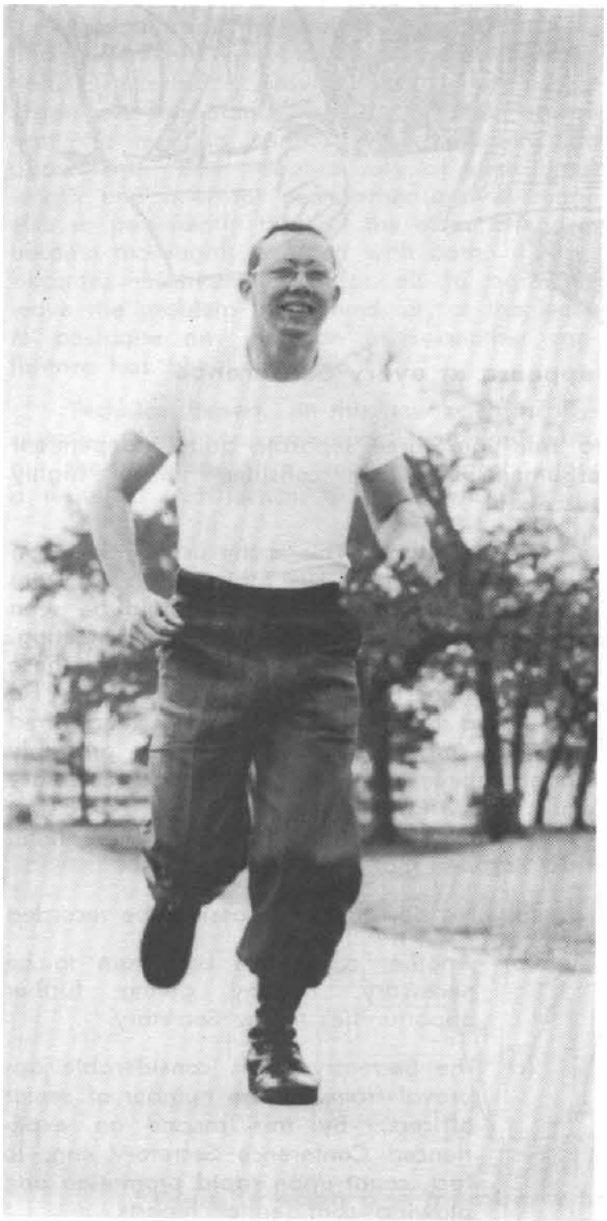
(a) There is no money allocated under current estimates for this project.
(b) Before the project could even merit serious consideration, comparable saving must be achieved elsewhere.

He then invites all present to suggest where this saving should be made, and returns to the "Financial Times" This ensures that the meeting breaks up not less than one hour later in an acrimonious atmosphere of extreme antagonism, no decision, of course, being agreed or even likely.

The Chairman. Normally the most distinguished officer present, he is usually the representative of the branch which does not want to make a decision. He therefore, steers the conversation into lengthy and irrelevant discord, using the Technical Expert, Branch Representatives and the Financial Wizard to prevent the Bright Young Fanatics from agreeing with each other. If he can get the meeting to split into three separate quite independent arguments, he can consider himself highly successful.

The Secretary. This is the usual role given to a new conferee. His main job is to write the minutes. To this end he should be seen making copious notes throughout the meeting. The experienced Secretary, however, tears these up as soon as he gets back to his office. He then writes down **not** what the distinguished conferees said, **nor even** what they probably thought they said. NO. A good Secretary works out what they would have liked to say if they could have thought of it at the time. This ensures that:

(a) No decision can possibly be recorded
(b) Another conference is certain to be necessary, thereby giving further opportunities to the Secretary.
(c) The Secretary earns considerable approval from a large number of senior officers. By this means an experienced Conference Secretary can, in fact, count upon rapid promotion and glowing confidential reports.

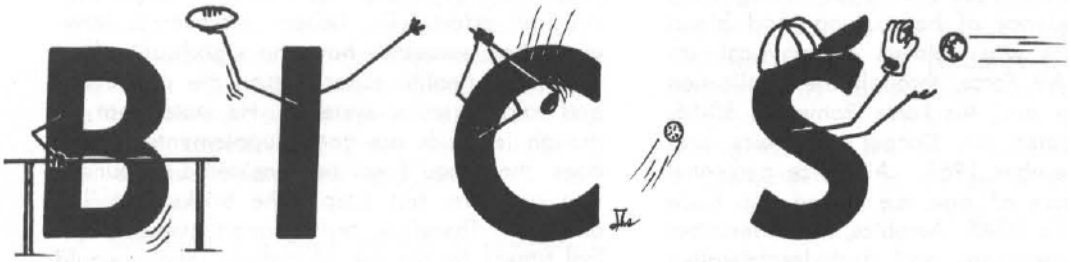


by
CPT Robert G. Tetu, Jr.

Dr. (LTC, USAF) Kenneth H. Cooper's book, **Aerobics,** published in 1968, had an overwhelming, immediate impact on the lives of millions of Americans. Polls from Dallas, Texas, in mid-1968 indicated that 186,000 people were following aerobics physical conditioning programs in 60 counties of Texas alone. Projected nationally, this figure indicated that millions of Americans were participating in aerobics programs. In May 1968, the Armed Forces of Sweden, Austria, Finland, Korea, and Brazil laid plans for their aerobics programs, and in 1969 the United States Air Force adopted aerobics as its formal physical conditioning program.

Because of the successful and impressive research conducted by Dr. Cooper and the acceptance of aerobics by so many individuals and organizations, it is time that the Army took a strong look at its own physical conditioning program with an attitude toward improving it.

What is aerobics? The word itself means nothing more than "with oxygen." It is a title given to methods of exercise that stimulate heart and lung activity for a period sufficient to produce beneficial changes in the body. Typical aerobic exercises are running, swimming, cycling, handball, and tennis. On the basis of research conducted with the most modern and sophisticated testing equipment in the field of exercise physiology and involving, eventually, more than 15,000 test subjects, Dr. Cooper determined that the best way to measure a person's overall physical fitness is to evaluate his ability to process oxygen. He made these evaluations by placing test subjects



on treadmills that he could manipulate with regard to speed and slope and measuring the amount of oxygen that these individuals used in walking, jogging, or running. From these tests he determined which exercises increased a person's oxygen consumption and which had little, if any, beneficial effect. From this point he developed tests, performance charts, and physical fitness categories that could be applied to virtually all American forms of exercise and sport. The fitness program that finally resulted can be applied to every individual.

The most popular result of the research—the one that attracted so many individuals—was the "point system." The system is nothing more than the accumulation of a number of points assigned to various exercises performed by an individual within a 7-day period. An individual must accumulate a minimum of 30 points a week to stay in the "excellent" fitness category, the goal of all aerobics participants. The following are examples of exercises and the points that can be earned for each:

Exercise	Length/Duration	Points
1.5-mile run	12:00-14:59 minutes	6
Handball	1 hour	9
Cycling	5 miles (20-29:59 minutes)	2 ½
Golf	18 holes (no electric cart)	3
1.0-mile run	6:30-7:59 minutes	5

Exercising a minimum of 4 days a week, an individual keeps track of the points he earns each day, and his goal is to accumulate at least 30 points by the end of each week.

Another major result of aerobics research was the development of a valid test that accurately determined an individual's physical conditioning level and could be used instead of complicated oxygen-measuring devices and treadmills. As a result, the 12-minute or 1.5-mile run was developed. This test proved to be extremely effective and accurate when administered to more than 1,500 members of the Air Force. A subject would run as far as he could for 12 minutes and be rated according to distance, or he could run for 1.5 miles and be rated according to time. Tests proved conclusively that any distance less than 1.5 miles or a running duration of less than 12 minutes was too short to accurately test an individual's endurance or aerobic capacity. This discovery was a breakthrough in physiological research, because for years athletic teams and other organizations (to include the Army) have been evaluating the endurance of individuals through the use of the mile run, or even the 600-yard run.

Overall, from the thousands of tests performed, it was determined that participation in aerobic exercise achieves many beneficial results.

- Lung efficiency is increased, and therefore the lungs can process more air with less effort.
- Heart efficiency is increased. The heart of a conditioned man beats much more easily than that of a nonconditioned man and thus saves thousands of beats per day.
- The number and size of blood vessels are increased. This allows more body tissue to be saturated with oxygen.
- The total blood volume is increased.
- The tone of muscles and blood vessels is improved as weak, flabby tissue is changed to strong, firm tissue.
- Fat weight is changed to lean weight.
- Oxygen consumption is increased. This builds a bulwark against illness and disease.
- Individuals are more relaxed, tolerate stress more easily, sleep better, and work with more efficiency.

At the time that the aerobics studies were initiated, the leading cause of death among Air Force personnel was heart disease, even though 98 percent of the Air Force population was less than 50 years of age. Recognizing that the frequency of heart, lung, and blood vessel diseases was related to physical inactivity, the Air Force, through the publication of regulations and Air Force Pamphlet 50-56, formally adopted Dr. Cooper's aerobics program in November 1969. Air Force personnel under 50 years of age are issued Air Force Pamphlet 50-56 USAF. Aerobics, which describes the aerobics program and includes detailed point charts of all aerobic exercises. In addition, Air Force regulations require that every individual pass a 1.5-mile running test semiannually.

The Air Force revitalized its physical fitness program on the basis of an exhaustive and intensive research program. But what about the Army? Is the Army's physical fitness program "up to snuff" in light of the latest findings?

The Army's basic concept of the importance of physical conditioning is not too different from that of the Air Force. FM 21-20, **Physical Readiness Training,** states that the ". . . basic concept of physical fitness training rests on the fact that the regular administration of standardized physical fitness tests is the best known method of evaluating physical readiness." The testing vehicle that the Army uses to evaluate physical readiness is the Physical Combat Proficiency Test, or PCPT. However, in light of the aerobics studies, there is doubt that the PCPT really indicates a soldier's overall physical fitness.

The PCPT is composed of five events: the 40-yard crawl; the horizontal ladder; the dodge, run, and jump; the grenade throw (the 150-yard man-carry is substituted for trainees); and the mile run. A maximum of 100 points is awarded for each event. Combat troops must achieve at least 300 points without failing a single category in order to pass. Combat service support troops must simply achieve a total of 300 points. AR 600-9 requires that the test be taken semiannually by men under 40. Those over 40 take other calisthenic tests, which are outlined in FM 21-20.

In FM 21-20 the Army recognizes and discusses two basic types of exercise, isotonic and isometric. Isotonic exercise is defined as that in which energy is regulated and released during consecutive efforts. (Isotonic exercises are recognized as calisthenics by the layman.) Isometric exercise is that in which maximum effort is applied and held until the engaged muscle energy is depleted during a single construction effort. Dr. Cooper discovered, however, that isometrics have no significant effect on overall health, especially on the pulmonary and cardiovascular systems. He states that although isotonics are good supplementary exercises, they should not be considered a foundation program, but simply the bricks that "go on top." Therefore, testing one's overall physical fitness by the use of isotonic means would not be effective on the basis of the new aerobics research. FM 21-20 does not ignore cardiovascular exercise, but it considers "cir-culorespiratory endurance" as a component of physical fitness. It states that development of "wind" can be greatly increased by exercise. However, Cooper's research has determined that "wind," or cardiovascular endurance, **cannot** be increased by the two types of exercise recognized by the Army.

Some may pose a question concerning the mile run event in the PCPT—is that not an aerobics exercise? It certainly falls into the running category! True, it does, but it is not an adequate test of physical fitness because of its short duration. You will recall that Cooper found that the mile run was simply too short for adequate testing. Cooper adds that tests like the mile run measure the "anaerobic" capacity, or the ability of an individual to perform at a high level of energy output for **very short** periods.

Let us look again at our soldiers over 40 who are tested by the Army. The calisthenic tests that they perform are as worthless as the events in the PCPT, in fact, they can be harmful. Dr. Cooper has even advised against calisthenics for older people because of increased danger of muscle strain around the joints. We should have great concern for people in this age group, because they are the most susceptible to heart disease.

In the spring of 1971, an aerobics program was offered at the United States Military Academy to 149 cadets of the Second (Junior) Class as a volunteer subcourse for a semester. The cadets participated individually in the program and were required only to attend the course introductory lecture and the course summary. Cadets were graded weekly on a 3.0 (maximum) basis according to the number of points they earned during the week. They also took a 15-minute run test in the first and last

weeks of the program. (The 15-minute test was developed by Dr. Bruno Balke of the University of Wisconsin and is considered to be an even better measure of fitness than Cooper's 12-minute test for an already conditioned athlete.) For the entire semester, the Cadet's average grade was 2.9 and their average score was more than 68 points a week. Considering the academic and military requirements that limit the cadets' free time, the attitude of the cadets toward the program was very impressive.

Although it is quite difficult to compare a cadet with a soldier in determining the possible application of an aerobics program to the Army, certainly some comparisons can be made. If a cadet could work the program into his schedule and achieve 68 points a week, it would seem that a soldier could achieve 30 points a week. The age group of the cadets is comparable to that of most of our young soldiers—and it will be the young soldiers who will initially "take" to the program. Of course, sufficient interest and guidance will have to be generated by "older folks" to really get the program rolling. Finally, with regard to the testing itself, it will be much easier to obtain a stopwatch and to lay out a 1.5-mile course than to construct an entire PCPT layout.

Cadets, pilots, airmen, women, heart patients, and virtually all other types of Americans have taken aerobics to heart, and all are in much better condition for their efforts.

CPT Tetu's article, Aerobics, was selected for the writing award in his Advanced Course FAOAC 1-72. Since that time the Army has made some modification to the PCPT test. After completion of the Advanced Course CPT Tetu attended the U. S. Naval Test Pilot School, Patuxent River, Maryland. He is presently attending CGSC at Fort Leavenworth, Kansas.

GUN-BORING TECHNIQUE IMPROVED

Acclaimed as a "major advance" in cannon manufacturing technology is the development of a new bore guidance system at the Benet Weapons Laboratory, Watervliet (NY) Arsenal.

Designed and developed by William Wondisford, Advanced Engineering Division, the method produces a bore straight to within five-thousandths of an inch along the 36-foot length of a 175-mm barrel. Boring time is reportedly reduced by 31 hours, or 80 percent.

The system consists of cutting tools and a boring head with an accelerometer that detects and, through a servomechanism, instantly corrects any eccentric movement of the head—to preclude any deviation from a straight course in much the same manner as an automatic pilot keeps an aircraft on true course.

Only one pass through the tube is required instead of the several needed when the conventional method is used, thereby reducing the amount of surplus material on the outer diameter of the forging.

Watervliet Arsenal is presently employing two of the guidance systems—both on 175-mm tubes. Because of the success of their performance, plans are under way to adapt the system for use in boring tubes for the 105-mm gun and 155-mm and 8-inch howitzers.

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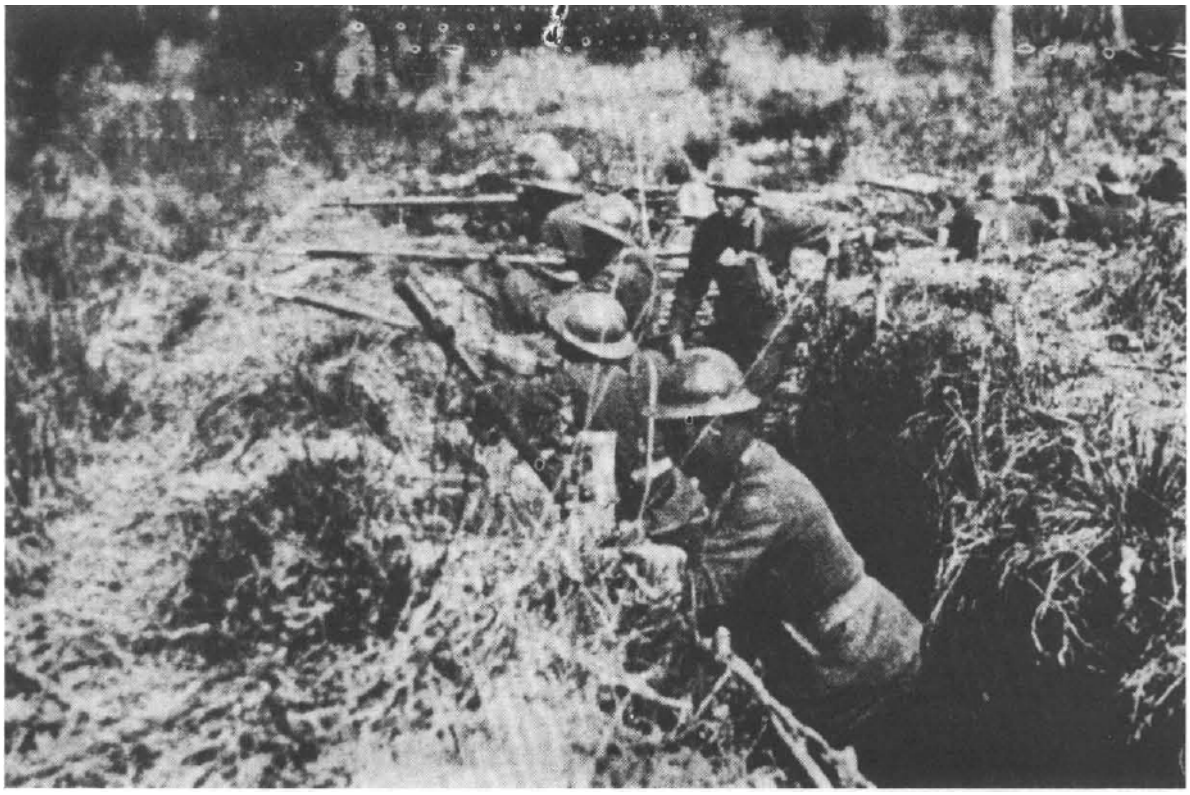
THEY ALSO FOUGHT

by
Major Robert Dalton

When World War I began in 1914, American Negroes certainly were not concerned with Europe's problems. Their own problems were more than enough to claim their attention. They had been considerably heartened by presidential candidate Wilson's assertion in 1912 that he wished to see "justice done to the colored people in every matter; and not mere grudging justice, but justice executed with liberality and cordial good feeling."



The 369th Infantry in the trenches.

Many Negroes had been won over to the Wilson camp by the candidate's clear-cut expression of good will. This is significant because Negroes had been skeptical of the Democratic Party since the Reconstruction. They kept their eyes fastened on Washington to see what the first southernborn President since the Civil War would do. Wilson had said, "I want to assure them that, should I become President of the United States, they may count upon me for absolute fair dealing, for everything by which I could assist in advancing the interest of their race in the United States."

In the early years of the Wilson administration, it was plain to see that Negroes were watching Washington rather than Paris or Berlin. What they saw dismayed them greatly. The first Congress of Wilson's administration received the greatest flood of bills proposing discriminatory legislation against Negroes that had ever been introduced. At least 20 bills advocated segregation of the races on public carriers in the District of Columbia, exclusion of Negroes from commissions in the Army and Navy, separate accommodations for Negro and white Federal employees, and exclusion of all immigrants of Negro descent. Although most of the legislation failed to pass, Wilson, by executive order, segregated most of the Negro Federal employees so far as eating and restroom facilities were concerned.

In 1915, the President ordered the occupation of Haiti by the Marines, and subsequently several hundred Haitians were killed. Most Negroes found this repulsive, and many protested loudly the violation of that country's sovereignty and territorial integrity. In the same year, the most notable motion picture of the time, "The Birth of a Nation," was released. This motion picture, based on the anti-Negro writings of Thomas Dixon, was a distorted story of Negro emancipation, enfranchisement, and violation of innocent womanhood.

After Booker T. Washington died in late 1915, there was no Negro leader whom the majority of the citizens of the United States respected. In the midst of these troubled times, an increase in lynching and other forms of violence added to the anxiety of Negroes.

This was the time, some of the more aggressive believed, to consolidate Negroes and achieve unity in thought and action. Toward this end, the American Conference (which included the most distinguished Negroes of the time) was called in 1916 in the home of Joel Spingarn. Those attending agreed to work quietly and earnestly for the enfranchisement of Negroes, the abolition of lynching, and the enforcement of the laws protecting civil liberties.

The United State's entry into the war in 1917 created a problem for Negroes: To what extent should they sacrifice their protest in order to devote their energies and morale to the war effort? Their decision was to support the war wholeheartedly because of the obvious material advantages the war could bring to Negroes in the form of new opportunities and new experiences.

In addition, Negroes were impressed by the democratic reasons for which the war was being fought. Since the United States was fighting "to make the world safe for democracy," Negroes felt that some of this democracy might affect them also.

W. E. B. Du Bois, who by 1918 was recognized as an outstanding Negro leader, expressed this attitude in a very influential editorial in **Crisis,** the magazine established by the NAACP:

> "We of the colored race have no ordinary interest in the outcome. That which the German power represents spells death to the aspirations of Negroes and all dark races for equality, freedom, and democracy. Let us not hesitate. Let us, while the war lasts; forget our special grievances and close ranks shoulder to shoulder with our white fellow citizens and the Allied Nations that are fighting for democracy. We make no ordinary sacrifice, but we make it gladly and willingly with our eyes lifted to the hills."

Needless to say this was not the attitude of all Negroes toward the war, but it was a dominant one.

Seymour J. Schoenfeld, Lieutenant Commander, USNR, outlined the pattern shown during armed conflicts of the United States up to that time:

> "At first the Negro is practically ignored. Then, as the nation requires his services, he is permitted to participate in the conflict in limited and usually menial and laboring capacities. If the crisis becomes greater, he is permitted to fight and die for the nation that has, in fact, granted him only a secondary citizenship."

Negroes were among those who thronged the recruiting stations in April 1917 seeking to volunteer their services, but for the most part they were not accepted. The passage of the Selective Service Act on 18 May 1917, however, provided for the enlistment of all able-bodied

American males between the ages of 21 and 31. On registration day in July, more than 700,000 Negroes registered. Before the end of the Selective Service enlistment, 2,290,525 Negroes had registered and 367,000 of them were called into the service.

Negroes were especially eager to participate in the struggle, not only as enlisted men but as officers. The chance of Negroes receiving officer training during this time was meager. Negroes were greatly disheartened by the involuntary retirement of the highest ranking Negro officer, Colonel Charles Young, because of high blood pressure.

Colonel Young, a West Point graduate, was retired on the basis that he was physically unfit for active duty in France. Although he rode horseback from Ohio to Washington to disprove the charge, the retirement board remained unconvinced. Colonel Young's retirement was a heavy blow to the high expectation of Negroes. Some pointed out that he was one of the few field grade officers with Pershing in Mexico whom the general had recommended to command militia in the federal service. Others, quoting white officers who had said as much in public addresses, asserted that Young was retired "because the Army did not want a black general."

Colonel Charles Young

Almost immediately, students at Howard, Fisk, and Atlanta Universities; Tuskegee Institute; and other Negro institutions began a program of agitation for the training of Negro officers. A committee of representative citizens headed by Joel Spingarn went to Washington to confront the military authorities. When Spingarn took the matter up with General Leonard Wood, the general said that if 200 Negroes of college grade could be secured, he would see to it that a training camp was established for them. Early in May 1917, a central committee of Negro college men was set up at Howard University, and, within 10 days, it had collected the names of 1,500 Negro college men who wanted to become officers in the United States Army. After procurement of the signatures and the presentation of a statement justifying the establishment of an officer training camp for Negroes, 300 Senators and Representatives approved the proposal and the movement to establish the camp began in earnest.

Although some Negroes denounced the idea of a separate camp, the general feeling among Negroes was that this arrangement was better than no facility at all. The camp was established at Fort Des Moines, Iowa, and, on 15 October 1917, 639 Negroes were commissioned—106 captains, 329 first lieutenants, and 204 second lieutenants. Later, at non-segregated camps and in the field, other Negroes received commissions in the Army. At colleges and high schools throughout the country, Negroes prepared to become officer candidates and to serve the Army by participating in such organizations as the student's Army Training Corps and the Reserve Officers Training Corps. This author's father participated in the ROTC at Bennett College in North Carolina; however, the war ended before he completed his service and he was released before receiving his commission.

Including those Negroes who enlisted and were drafted and the 20,000 Negroes in the Regular Army and National Guard, the number of Negroes in the Army at the beginning of the war was 404,348. Of this number 1,353 were commissioned officers, 9 were file clerks, and 15 were Army nurses. Ten percent saw combat overseas. The majority were in labor battalions.

In World War I, most of the 404,348 Negro troops were assigned to supply, quartermaster, stevedore, and pioneer infantry units. Two infantry divisions, the 92d and 93d, were

formed and sent to France. Four Regular Army regiments were assigned to defensive positions in the continental United States and its island territories.

The problem of training Negro soldiers in the United States plagued the War Department from the beginning. While the Army was committed to the activation of an all-Negro division, the 92d, no arrangements were made to train all the men at the same camp. Thus the men of the all-Negro division were trained at seven widely separated camps, from Camp Grant in Rockford, Illinois, to Camp Upton in Yaphank, New York. It was the only instance in which a division was never actually brought together until it reached the fighting front. Another Negro division, the 93d, was never brought up to its full strength; after training in different places, the units that were organized were sent overseas at different times to join various fighting units of the French Army.

Complaints flooded the War Department that Negroes were continuously insulted by white officers, who referred to Negroes as "coons," "niggers," and "darkies." Frequently, Negroes were forced to work under unhealthy and hazardous conditions. They were indiscriminately assigned to labor battalions even when they were qualified for other posts requiring higher skills and intelligence.

Racial tension in the South caused the War Department its greatest concern. Southerners objected to the Army sending northern Negroes into the South for training. There were many incidents of outward confrontation between the white citizens of the South and the Negro soldiers sent there for training.

At Spartanburg, South Carolina, where the Fifteenth New York Infantry was in training at Camp Wadsworth, white citizens felt that something was needed to show the New York Negroes their place. In October 1917, when Noble Sissle, the drum major of the unit band, went into a hotel to purchase a newspaper, the owner cursed him and asked him why he did not remove his hat. Before Sissle could answer, the white man knocked his hat from his head. As Sissle stooped to pick it up, the man struck him several times and kicked him out of the hotel. When the other men of the unit discovered what had happened, they were incensed. The following evening, the soldiers, planning to shoot up the town, left Camp Wadsworth for Spartenburg; however, their commanding officer, Colonel William Haywood, overtook them and ordered them back to camp.

Black labor battalion

The War Department rushed representatives to the scene in an attempt to prevent bloodshed. The War Department had three courses of action:

(1) It could keep the soldiers at Camp Wadsworth and face a violent eruption.

(2) It could remove the unit to another camp.

(3) It could order the regiment overseas.

The last alternative was selected, and the Fifteenth New York Regiment, redesignated the 369th Infantry, was sent to Europe. It was the first contingent of Negro combat troops to reach the theatre of war.

The first Negroes, and among the first Americans, to arrive in Europe were the laborers and stevedores who were needed to assist in the tremendous task of providing the Allies with the materials of war. The first Negro stevedore battalion arrived in France in June 1917. From that date to the end of the war, they came in large numbers. They were classified as stevedore regiments, engineer service battalions, labor battalions, signal companies, medical companies, butchery companies, and pioneer infantry battalions. Before the end of the war there were more than 50,000 Negroes in 115 units—more than one-third of the entire American forces.

After many hardships at sea, including breakdowns, fires, and a collision, the 369th United States Infantry (Fifteenth New York) arrived in France in early 1918. After training with the French Army in April of that year, they moved up to the fighting front. By May, they were in the thick of the fighting. In Champagne, for a time, they held a complete sector making up 20 percent of all the territory held by the Americans at that time. After being pulled back for a while, they were placed in the path of the expected German offensive at Minaucourt, where they withstood the brunt of the German attack. From that time on, they were in constant contact with the enemy, and, at the end of the war, they could boast of many things. The 369th Infantry was the first unit of the Allied armies to reach the Rhine. The regiment never lost a man through capture or lost a trench or a foot of ground. Having been in the trenches 191 days, it saw the longest service of any American regiment.

The 80th Illinois Infantry, renamed the 370th United States Infantry, reached France in June 1918. It was equipped with French arms and sent to the front. In September, after occupying several positions along the front, the regiment, under the 59th Division of the French Army, took over a full regimental sector in the area of Mont des Tombes and Les Tueries. From that time to the end of the war, the 370th helped push the Germans out of France into Belgium. It also fought the last battle of the war, in which it captured a German wagon train of 50 wagons and crew one-half hour after the armistice went into effect.

The 371st Infantry Regiment arrived in France in late April 1918. It was then reorganized according to the French plan and attached to the 157th French Division, the famous "Red Hand" Division, under General Goyhet. Holding first the Avocourt and later the Verrieres subsectors northwest of Verdun, it remained on the front lines for more than 3 months. In the great September offensive, the regiment took several important sites near Monthois and captured a number of prisoners, many machineguns and other weapons, a munition depot, several railroad cars, and many other supplies.

The 372d United States Infantry was a catchall outfit composed of Negro National Guardsmen from the District of Columbia, Ohio, Massachusetts, and Maryland. Late in May 1918, it took over the job of holding the Argonne West Sector. During the summer, it was subjected to heavy shelling in the Verdun Sector, and, in September, it went "over the top" in pursuit of the enemy. It remained in contact until the German surrender in November.

Because of the irregular procedure of the units having been trained in separate camps, the 92d Division was late in joining the fighting. After arriving in France in June 1918, it was put through 8 weeks of intensive training. Late in August, it took over the St. Die Sector, where it relieved several regiments of the American and French forces. Almost immediately, the division got its baptism of fire in the form of shrapnel and gas. In September, the division attacked the Germans; as a result of the encounter, several Germans were captured and two Negroes were captured by the Germans.

When it became clear to the Germans that they were up against an all-Negro division, they launched a propaganda campaign to accomplish with words what they could not do with arms. On 12 September 1918, they scattered over the lines circulars that sought to persuade the Negroes to lay down their arms. They tried to convince Negroes to come over to the German side, where they would be given equal treatment.

> "What is Democracy? Personal freedom, all citizens enjoying the same rights socially and before the law. Do you enjoy the same rights as the white people do in America, the land of freedom and democracy, or are you rather not treated over there as second class citizens? Can you go into a restaurant where white people dine? Can you get a seat in the theatre where white people sit? * * * Is lynching and the most horrible crimes connected therewith a lawful proceeding in a democratic country? Why then fight the Germans only for the benefit of the Wall Street robbers and to protect the millions they have loaned to the British, French and Italians?"

Negroes were invited to come over to the German lines, where they would find friends who would help them in the cause of liberty and democracy; however, they resisted to a man and none of them deserted.

In September, the 92d did its share by holding two sectors during heavy fighting. There were numerous casualties from gas and enemy artillery fire.

In assessments of Negro participation in World War I, the two infantry divisions received most of the public and official attention during and after the war. Of course, it is true of any war that the front line troops get most of the press while the support troops, for the most part, are unnoticed. With this in mind, let it suffice to say that it was no small task in keeping the Allied armies supplied with the materials needed to wage war. Since most of the Negroes not on the front were engaged in some way with moving these supplies, their contribution to the war effort was substantial.

A wealth of material was written about the gallantry and steadfastness of the Negro combat troops. Their worth in combat is clearly seen in the praise accorded them by ranking military officials. General Goyhet said:

> *"Never will the 157th Division forget the indomitable dash, the heroic rush of the American regiments (negro) up the observatory ridge and into the plains of Monthois. * * * These crack regiments overcame every obstacle with a most complete contempt for danger. Through their steady devotion, the 'Red Hand' Division for nine whole days of severe struggle was constantly leading the way for the victorious advance of the Fourth Army."*

In January 1919, General Pershing said:

> *"I want you officers and soldiers of the 92d Division to know that the 92d Division stands second to none in the record you have made since your arrival in France. I am proud of the part you have played in the great conflict which ended on the 11th of November. Yet you have only done what the American people expected you to do, and you have measured up to every expectation of the Commander in Chief."*

Major Robert B. Dalton is a native of Virginia and a 1961 graduate of Virginia Union University.

Major Dalton was drafted into the Army in July, 1962. He was commissioned as a 2LT in 1963 after graduating from Field Artillery Officer Candidate School at Fort Sill, Oklahoma.

Military schools attended by Major Dalton include the Field Artillery Officer Candidate School, Airborne School, Fixed Wing Aviator Course, Rotary Wing Qualification Course, Combat Operation Specialist Course, Aviator Safety Orientation Course, Field Artillery Officers Advanced Course.

PNEUMATIC FUZE FOR ARTILLERY

The U. S. Army Munitions Command (MUCOM) is developing fluidic systems for several applications.

Picatinny Arsenal has been involved with development of a fluidic initiator called the "pneumatic match." The low-cost initiator uses a resonance tube to generate intense heat and can be used to replace electrical initiation schemes. Laboratory and field tests have been conducted to demonstrate its high reliability.

MUCOM has sponsored investigation of two concepts for fluidic arming of point-detonating fuzes for high-performance artillery and mortar munitions. One concept utilizes a fluidic arming and delay circuit that integrates the velocity and provides a constant arming distance of several hundred feet. The other concept, called the fluidic generator, converts ram air into electrical power and is now under development for the Army's Advanced Beehive ammunition fuze.

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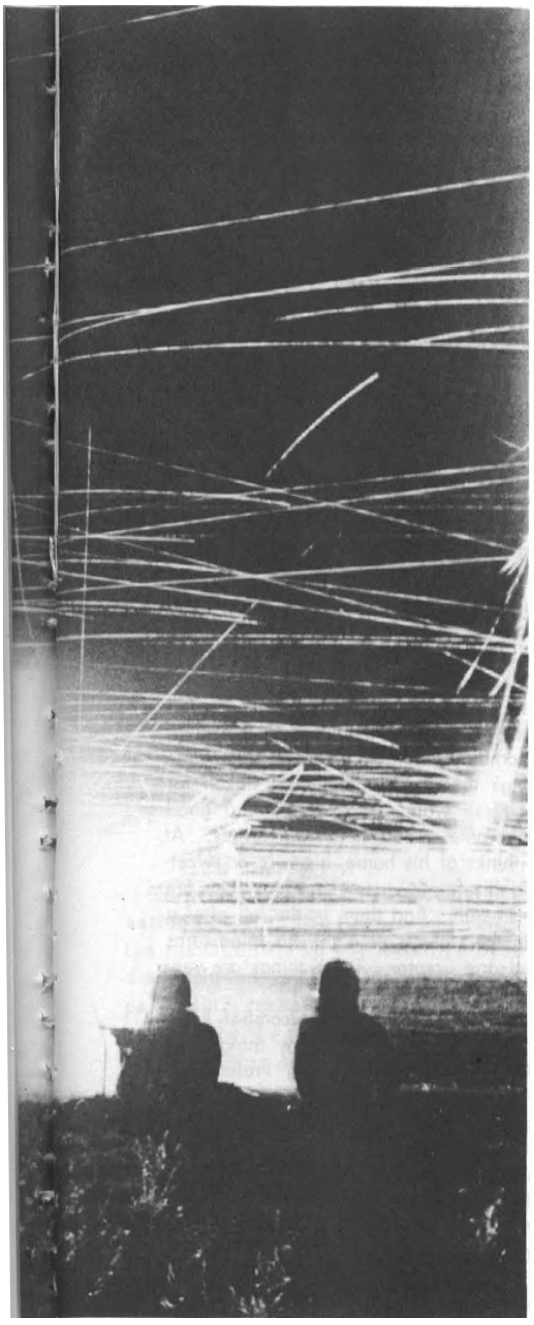
THOUGHTS ON COMBAT

by

LTC George C. Wallace



A professional soldier can spend a lifetime studying his profession, but until he has gained combat experience, his training is incomplete. For it is in combat that a soldier learns many lessons that he cannot learn in training and faces many tests of his leadership, his courage, and his character.

War has a fascination for some men. They seem to be nourished by it and are at their best in the thick of a battle. Combat seems to be their natural element, and they seem to casually accept even its worst aspects. Some men who were considered to be good leaders in training may fail in combat; others who showed little or no potential may emerge as natural leaders whom others will follow. These few men do most of the fighting. They are the key to the combat success of their units, and they earn the highest combat decorations. These men should be identified, recognized, and promoted as fast as possible.

Sudden close combat has a paralyzing effect on some men and reveals natural combat leadership in others. For example, a company was ambushed in Vietnam. Heavy small-arms and mortar fire had paralyzed the unit; the men went down and stayed down. The company commander, from the center of his formation, began to shout orders, but nothing happened. Finally, one man got up, emplaced a machinegun, began shouting to others nearby, and started moving toward the enemy. Seeing his example, about 10 men followed. Others then got up and joined the assault. The responses of men to natural combat leadership must be seen to be fully appreciated.

During training, we try to create situations that will develop and test a soldier's courage, but this can be done fully only in combat. In battle, a man's survival is at stake and self-preservation is a dominant instinct. All but the rarest of men are plagued with fear in combat. Most men are able to control their fear and make it work for them. In one case, a soldier was under cover during a battle. Suddenly, he became aware that one of his legs was shaking almost uncontrollably, and he realized that he had to do something. He began to move and, with a sense of mental detachment, joined the fight. His fear, if not gone, was completely controlled. In another case, an officer was resting near a trail during a search for the enemy. He had just checked the immediate area and felt completely safe and relaxed. Suddenly, a machinegun was fired near him and, before he realized it, he was on his feet and running. After taking several steps, he regained control of himself,

but the impact of combat and the fear produced by it was demonstrated. Under the right conditions, even combat experienced and highly decorated soldiers sometimes panic. A man cannot know his courage until he is faced with a life-or-death situation. That cold, gripping feeling of fear can only be appreciated by those who have experienced it in battle.

Another lesson that can be learned only in combat is the importance of visits by senior officers to units that have suffered casualties. The sooner these visits take place after combat, the better. It is amazing how the presence of a senior commander can raise the spirits of a unit that is demoralized as a result of casualties. The morale and fighting spirit of a unit can be maintained even under sustained combat operation and heavy casualties. One battalion in Vietnam lost more than 25 percent of its men in less than 6 months, yet it retained its high morale and fighting spirit. This was the result of high-quality leadership, close comradeship between the leaders and their men, and their belief in the cause for which they were fighting.

A leader can care for and gain the devotion of his men in training for combat, but it is in battle that this emotional attachment is fully developed. While two officers were visiting their wounded men in a hospital, one of the officers became ill at the sight and almost had to leave the room. After the visit, both men cried. A man may cry when a comrade is killed, though he could not have been considered a close friend when he was living. Sometimes a soldier may cry even when he hardly knew the man who was killed.

A soldier can love his leader almost as a son loves his father. An example of this type of love was demonstrated during the Korean War. A young company commander was killed during the night. Several of his soldiers carried his body to an evacuation point and remained there through the night. As dawn was breaking, they left, crying, and one soldier stooped and kissed the hand of his beloved leader. An officer who experiences or witnesses this type of devotion between men and their leaders better understands man as he is in battle.

Another lesson learned by experience in combat is the effect of casualties on a leader and his unit. How does a leader feel when his subordinates are killed or seriously wounded? How does he feel when he picks up the body of a young man he recently reprimanded and has to clean parts of the man's brains off himself and the man's equipment? Can a soldier ever forget a personal experience in which he survived only through the grace of God? Or even the feeling one might get when he views the mangled bodies of the enemy killed by his unit? A visit to a hospital full of soldiers with their arms and legs missing and with other serious wounds can bring tears to even the strongest man. Some commanders do a lot of soul-searching when they realize that their mistakes may have cost the lives of some of their men. These things can be learned only in battle.

Another feature of war that must be experienced to be appreciated is the boredom of war. The constant "hurry up and wait," the long truck or airplane rides, the repetitious duties that must be performed, the fruitless patrolling, the frustration of waiting—all are part of the well-known boredom of war. Despite the casualties suffered, short periods of combat are actually a relief to most men of a combat unit.

In combat a soldier realizes that the enemy is faced with the same problems that we face. He, too, is short of men, loses his best subordinates, and suffers the same hardships. One minute he is trying to kill you; and a few minutes later he may be dead, badly wounded, or a prisoner of war. It is natural, at times, to feel compassion and to consider him a fellowman rather than an enemy.

A soldier's senses and emotions are sharpened in combat. In discussing his experiences with a combat veteran of an earlier war, one can sense this as he clearly recalls events. The sight of bleeding and torn bodies, the smell of burnt flesh, and the odor of explosives are all familiar to him and remain vivid in his memory. In combat, a soldier comes to appreciate many things that he has previously taken for granted. Fresh water, a good meal, a good bed—all become almost treasured desires. At night he thinks of his home, his wife or sweetheart, and his family. How precious they are at that moment! And then, in the lull after a fight or in the stillness of night, his mind turns to his God and Creator. These things are very real to a man in battle.

Only those who have seen combat know the ugliness of war and the many things that can be learned only from battle. Professional soldiers who have experienced combat and have learned these things have filled a gap in their training. They have vivid memories of the units in which they have served and of the men with whom they have shared their experiences. And, perhaps more important, they can understand why General Robert E. Lee once wrote: "It is good that war is so terrible, lest we grow to love it."

FIRING THE CORPS

The following information is provided by Field Artillery Branch of Officer Personnel Directorate:

WELCOME

Colonel William L. Shea has been designated as the new Chief, Field Artillery Branch and will be on board approximately 15 October 1973. Colonel Shea comes to Branch from duty with the Office of the Deputy Chief of Staff for Military Operations, DA. His recent assignments include command of the 2d Infantry Division Artillery and the 7th Division Artillery in Korea. Plans Officer for USMACV and command of the 3d Battalion, 6th FA at Fort Sill. He is a graduate of the Army War College and has a baccalaureate degree from the University of Nebraska at Omaha. He was commissioned from OCS and has been awarded the Legion of Merit (1OLC) and the Bronze Star Medal with V device.

NEED AN ADDRESS?

For those overseas or MDW assigned personnel, you may obtain the location of current active duty or retired Army personnel by writing to:

HQDA (DAPC-PAS-A)
200 Stovall Street
Alexandria, VA 22332

Retired locator phone is: 325-8774 (AUTOVON 221-8774)

Active Duty locator phone is: 325-9240 (AUTOVON 221-9240)

For other CONUS areas, you should contact your appropriate Army area Commanders' locator service.

FA BRANCH REORGANIZATION

To provide better service to you and to align our organization with the new functional organization of OPD, FA Branch has reorganized. Two major changes have been effected. First, the management of FA Aviators by a separate action officer in the Assignment Section has been discontinued. All Field Artillerymen are now assigned by the individual who handles their particular grade and geographical location (CONUS/overseas). A second major change has been effected by the adoption of the Officer Personnel Management System (OPMS). This necessitated dividing our old Personnel Actions and Education Section into the Personnel Actions Section and the Professional Development Section. When calling the Branch please use the telephone number of the section you wish to contact. The AUTOVON numbers are:

Office of the Branch Chief	221-7890
	221-7891
Assignment Section	221-0752
Personnel Actions Section	221-0421
Professional Development Section	221-0421

The Duke of Marlborough

by
LT Phillip E. Myers

Duke of Marlborough

Rarely in the general spectrum of decisive historical factors has it been realistic to divide the continuous flow of history into centuries. Historical eras usually delineate themselves by the particular patterns that lead to events. Yet, the military history of eighteenth-century Europe, almost from the outset, can be delineated clearly from that of the seventeenth by the magnificent deeds and innovations in military tactics and techniques by the great Duke of Marlborough. The leadership traits and principles marshalled by the Duke on his first successful campaign against France, were the keys to a new order in Europe that began with the shaking clash at Blenheim on 13 August 1704.

John Churchill was born on 24 June 1650 at Ashe House in the English West Country. The surrounding countryside was steeped in military tradition. Celt, Roman and Saxon had fought and died here. During the English Civil War, which had just been concluded in 1649 with the execution of King Charles I, the area had passed back and forth between the Roundhead-Parliament forces that ultimately won, and the Royalists.

Throughout the Cromwellian Commonwealth and Protectorate, 1650-1660, young John was raised in relative anonymity. A staunchly Royalist family, then nearly penniless, had little chance in this decade of harsh rule by the strong-willed military dictator, Oliver Cromwell. Yet, in this era John must have been instilled with the brave family military traditions, for his father must have told him stories of the recent Civil War, "though in the troubled atmosphere of that age of wars not much can have been needed to turn the boy's mind towards a military career."

After leaving St Paul's he obtained employment as a page to the royal heir, the Duke of York, who immediately took a fancy to this young aspirant. James Stuart, Duke of York, was keenly interested in military matters himself. He noticed John's enthusiasm for soldiering. The traits of initiative and enthusiasm John showed for the military impressed the Duke and helped get him a commission as ensign in the King's Regiment of Foot Guards on 14 September 1667. He was just seventeen.

Unsatisfied with the menial existence at court, John Churchill, as a young officer should, wanted active military duty. Thus he volunteered for service at Tangier where the British garrison incessantly engaged in petty fighting with the disruptive native Moors. Here he gained his first practical knowledge of warfare.

After quitting Tangier, Churchill rose rapidly in the military, proof of his dedication and devotion to duty. In 1672 he was in the Duke of York's service as a Captain when France and England declared war on Holland. Churchill accompanied a force of six thousand men under the Duke of Monmouth to join the French.

In 1674 he was made Colonel and served under the great French leader, Tureene, in Germany. Under Turenne, he learned to anticipate his enemy and learned the French system of organization. (Furthermore, he grew to know the French Military leaders of the future.)

In 1678, the fortunes of war changed when England deserted the French and joined the Dutch against Louis XIV. Churchill was made full Colonel on 17 February 1678 and sent to command part of the British troops aiding Holland. Among his duties as military leader, he was sent on a secret mission to confer with the Prince of Orange who was the Dutch leader and who later became King William III of England after James II was forced off of the throne in late 1688.

In February 1681, Churchill gave up his command as Lieutenant-Colonel of York's regiment. Then in November, 1683, he took command of the King's Own Royal Regiment of Dragoons. The year before he had been raised to the peerage. From 1683-85 he was at court in the intimate favor of both the King and the Duke of York.

In 1685, he was promoted to Major-General and effective commander of the royal army under Feversham that routed Monmouth's rebels at Sedgemoor.

Marlborough took command of the English forces on the Continent against France in 1689 and distinguished himself at the Battle of Walcourt. In 1690, Marlborough headed the forces in Ireland that captured Cork and Kinsale late in the year. Then in 1691 he accompanied William to fight in Flanders. Then suddenly in January 1692 he was abruptly dismissed from all appointments because William feared his popularity at court might lead to a palace revolution.

Ironically, political intrigues had stalled the development of an already-proven, outstanding military leader for a decade—until after William's death in 1702. Ultimately, his ensuing military victories over France after Blenheim, and his concommitant rise to political hegemony in Britain, caused him to fall from the twin pinnancles of success in 1711. His demise was due to the work of capable politicians, then rising at the court, who wanted to end the war. Even so, his abilities had enabled him to enjoy nearly a decade of unparalleled military and political success.

In 1698, he was also readmitted to Parliament and appointed to the Privy Council. He was made a Lords Justice, a group that administered England during the King's annual visit to the Continent. In 1700, William III appointed him Ambassador to Holland and commander of a force of twelve battalions being sent there the next year. The decade beginning in 1701 began the the Age of Marlborough.

The Allies were in a serious position early in 1704. To alleviate the strategical disadvantages, Marlborough and the capable leader of the Austrians, Prince Eugene, decided to fake as if they would move on the Rhine and feint abruptly for a march to the Danube. By this approach, Marlborough could pull off his concept of rapid maneuver at which he was most tactically proficient.

Vienna was threatened by a combined Franco-Bavarian Army of 45,000, later to be reinforced to 57,000 under the Elector Max Emanuel and Marshall Marsin. It was of the most vital importance to save Vienna, for if Austria was knocked out of the Allied effort, the French would be able to concentrate their entire efforts on the northern front in the Low Countries. Since Louis XIV's strategy was best suited for a slow-moving war, it was important for the Allies to take the offensive. Among the Allied Commanders, Marlborough was the most capable at employing offensive tactics. He had 40,000 men when he began his march.

The long march is a fine example of his administrative, as well as tactical ability. Before setting out, the permission and assistance of the German rulers through whose lands his columns would march was received. Bridges were all in good condition at the correct crossings. Provisions were ready when needed. Credits had been arranged with German bankers. In one of his revealing letters to Heinsius, the Grand Pensionary of Holland, Marlborough

urged him to pay the troops of the Duke of Wertemberg punctually to prevent an incident. Moreover, Marlborough reasoned, the attainment of good financial reputation in these areas would allow him to get cheaper troops in the future.

New boots awaited the army on the threshhold of Bavaria. Rigorous discipline assured good order and this was contributed to by food, clothing, and comfort. Thus, the Duke's men could never think they were forgotten by their leader.

Marlborough certainly set the example. On the march, first up the Rhine to Coblenz, he started daily at dawn and encamped at noon. He rode ahead with the cavalry and left the infantry and artillery to follow. His troops remarked that in this way the remaining part of the day's rest was as good as a day's halt. So the troops were able to march twleve to fourteen miles a day to cover the 250 miles from the Meuse to the Danube in less than six weeks and arrive battle-ready. Marlborough had learned the principle of know your men and look out for their welfare well.

Thus, they had internal unity and goodwill for their leader. A writer cannot pass up the words that Marlborough's descendant, Winston Churchill, wrote of the march:

> A scarlet caterpillar, upon which all eyes were at once fixed, began to crawl steadfastly day by day across the map of Europe dragging the whole war along with it . . . (It) beat the ground rhythmically with its feet. Up the hills and down the hills, through the forests and gorges, across the Main and the Neckar (Rivers), always wending on, while the Great King (Louis XIV) and his Marshals readjusted their views from week to week, and Europe, from one end to the other became conscious of an impending event.

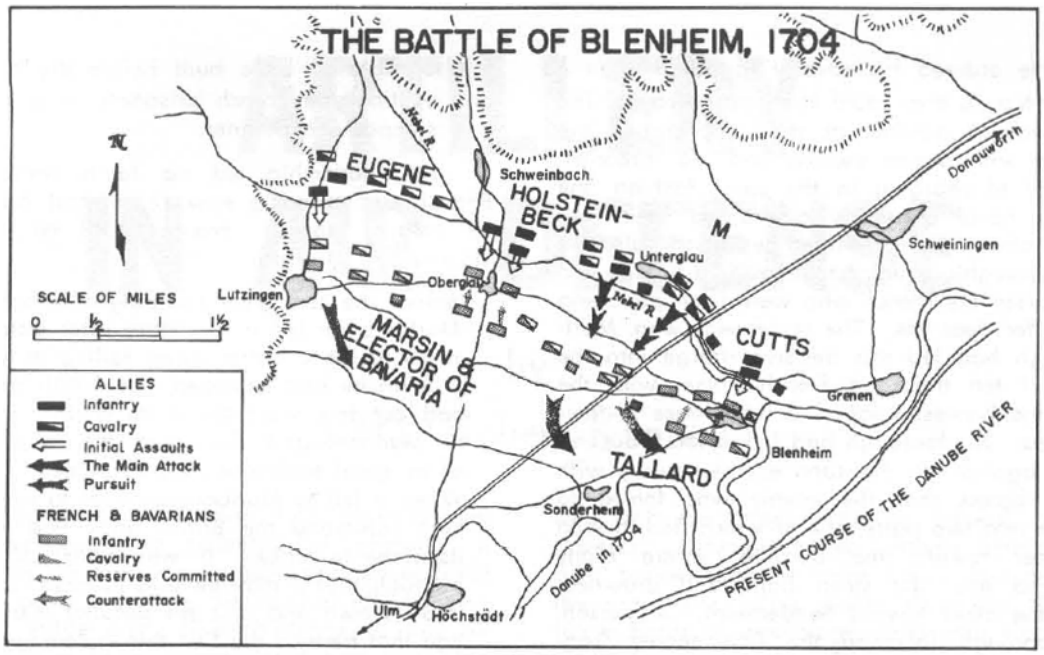
The march, superbly planned, was carried out with complete deception. By the time Marlborough entered Swabia he had the power to concentrate nearly 50,000 men. The total force of the Allies reached one hundred thousand, and Marlborough's tactical proficiency had put him in a central position between the Rhine and the Danube. This forced the enemy armies, of about equal strength, to reinforce themselves by long detours, for they lay on opposite sides of the Allies. Marlborough had completely baffled the French. Now instead of choosing between certain victories as they had in mid-May, there was only a choice of necessary evils confronting them. The Duke of Marlborough had achieved this tactical advantage without a shot being fired in either seige or battle. Marlborough was leaving traditional methods of warfare far behind, un-beknowst to the ill-fated French. Marlborough and Eugene, the general of the Imperial forces, were great colleagues. They got along splendidly. It was agreed that they would command the combined armies on alternate days. It was Marlborough's turn to command before Blenheim.

At Blenheim, all of Marlborough's tactics were used to decisive advantage to change the military balance of power in Europe. This was his first and, in my mind, his most significant victory. All of his later successes were built somewhat on his tactics and the leadership traits and principles he displayed at Blenheim.

First, Marlborough realized, as Robert E. Lee did over one hundred forty years later, that only aggressive action could repel the invader. And so he operated by using surprise. On the morning of 13 August 1704, Tallard, the French commander, thought Marlborough was withdrawing. Marlborough was doing just the opposite, at that time he was aiming to hit Blenheim, which anchored the enemy's right flank, the hardest, roll up the line from the river and strike decisively just to the right of the enemy center which Tallard had failed to reinforce strongly with infantry. But he had done so because he was certain the Allies would not attack due to his superior numbers. He forgot that Marlborough's confidence in the valor and discipline of his men, as well as in their state of training readiness, which he had conducted himself the preceding winter, pushed him to strike for sudden, decisive victory.

Yet Marlborough realized he must remain tactically flexible. To him this was being tactically proficient in this battle. For he had no direct means of knowing the enemy's overall disposition. He had then to draw up a plan according to the results of the first assault. He must have the initiative and decisiveness to know when he had forced the enemy to break at one strategic point, and press the advantage onward from here. This is what he courageously did.

His tactical proficiency paid off from the outset because his surprise strike left the enemy infantry weak in the center. Due to the surprise, they were still drawn up in the order of encampment, not in a battle order best for the defense of the actual ground.



Yet even though the center presented possibilities to Marlborough's tactical plans, Blenheim, facing his left, presented a graver obstacle. It was defended by garden hedges, military stockades and hasty barriers constructed of farm carts, tables and doors. Behind these massed the enemy battalions and batteries.

Marlborough, however, always had the initiative to keep the objective well in mind. When the first British attack on Blenheim was repulsed with Brigadier Rowe, its leader, killed, Marlborough ordered a holding action here. English and Dutch infantry units had only reached as far as the village's northern and eastern outskirts. The Duke's tactics were flexible enough to try to press the advantage he so earnestly sought elsewhere. Meanwhile, the enemy had to be kept bottled up in the village. His decision was perfect, for during the rest of the day sixteen British battalions held twenty-seven enemy battalions and twelve squadrons in place.

Knowing that he commanded the loyal devotion and confidence of his officers and men all along the front, his eye for the smallest detail allowed him to look elsewhere. He was everywhere on the front, and ventured his person too much according to one of his officers, Lord Orkney. Orkney records that "he exposed himself repeatedly. A cannon-ball grazed under his horse's belly, and covered him with dust." However, Marlborough's bearing and endurance, physical and mental, were unshaken, and he went on to rally his units. His first biographer, Lediard, reported that:

> during the battle he gave his orders with all the clearness and composedness imaginable, leading on his troops without the least hurry or perturbation, and rallying those troops that were disordered without those harsh and severe reproaches which rather damp than animate the soldier's courage.

Knowing that Eugene's units were tied up by Marsin's superior numbers on his right flank, Marlborough realized the enemy center was the exact spot for his decisive stroke. His innovations in military science that centered on harmonizing his infantry and cavalry units were applicable. Before crossing the Nebel River in front of the French center, he drew his units up in four lines; the front and back line were infantry; the second and third were cavalry. Thus the latter would support the center. By four in the afternoon he had amassed nearly eighty of these squadrons opposite the French center between Blenheim and Oberglan. Only a few of these had charged before; but the fifty to sixty French squadrons were mostly battle-weary. Marlborough rode out from Oberglan to conduct the advance of this formidable array. As he had done in earlier campaigns, Marlborough brilliantly used his cavalry as a mobile reserve. In this way he could quickly reinforce any threatened point. At five he knew that the tired, disunited enemy center was ripe for pulverization.

He ordered his cavalry to advance at a smart trot so they could keep closed ranks. The trot was to quicken as they approached the enemy with drawn swords and no firearms. Instead of charging in the same fashion, the French horse erratically discharged their firearms after halting. This hesitation allowed Marlborough's cavalry to engulf, disunite, and dishearten the French who were soon galloping away for dear life. The center was won. Marlborough had led this decisive charge into the face of ten thousand French horse, with the first and bravest troopers of all France in their saddles. Marlborough had led seven thousand horse against ten thousand enemy cavalry with such success that the enemy was forced to divide into two parts, one of which fled in wild disorder toward the Danube, where many plunged over the steep bank and drowned, and the other toward Sonderheim. In person, Marlborough followed the first enemy fragment with fifty squadrons. Both pursuits were entirely successful. Those who did not drown were captured on the marshy banks. Tallard himself was captured in Sonderheim. Marlborough, whose bearing and courtesy were unrivaled, gave Tallard his coach and six. Tallard waited in captivity there for two days until his own coach was brought back from his retreating army.

Marlborough then turned all the forces he could against the portion of the enemy still holding their positions. He captured all but one hundred French still on the battlefield. He divided the prisoners equally with his cogeneral, Prince Eugene, partly to compliment him, and partly for convenience, since guarding, feeding and disposing of fifteen thousand prisoners was a great task.

But the Allies had paid a great cost for victory. They counted a quarter of their total force, some twelve thousand killed or wounded. Of these the British and Dutch lost two thousand two hundred. Enemy losses numbered at forty thousand; moreover, all of their artillery was taken except for half a dozen pieces. Yet his victory had broken the terror in which the French armies of Louis XIV had been held for decades.

Marlborough had been in the saddle for seventeen straight hours, so dedicated was he to victory. Even so his trait of endurance continued, for after allowing himself only three hours' sleep, he was astir again arranging for the wounded, (some in hospitals he had had the foresight to have built before the battle), and visiting the French prisoners in a kindly and sympathetic manner.

His leadership led up to a revitalized English army and a new continental balance of military power. France could no longer dominate.

> Before the ten great campaigns in which Marlborough led it to victory after victory, never losing a battle, never failing to take a town he had besieged, the British army had but few successes to its credit. It is to Marlborough's days that the majority of its great traditions may be traced. . . . When it fell to Marlborough's lot to attain high command the British army had still its name to make. It was under Marlborough that it may be said to have come into its own and it is his peculiar distinction that he was the first British commander to achieve great things at the head of regiments of the Standing Army of Great Britain.

Thus here is the military side of a man, taken to the brink of his greatness. He went on to win successive campaigns until, ironically, political considerations at home relieved him of his command in 1711. But by then he had proven what is perhaps a fitting eulogy, that he:

Inspired repused battalions to engage, and taught the doubtful battle where to rage.

2LT Phillip E. Myers, Iowa National Guard, is currently a Ph.D. candidate in history at the University of Iowa, Iowa City. He attended the Iowa Military Academy, Camp Dodge, Iowa, and was commissioned in Field Artillery in June 1971. A graduate of the Field Artillery Basic Officers Course at Ft. Sill in November, 1971. He received his BA and MA in history from the University of Colorado.

Currently he is FDO, Btry B, 1st Bn (105 howitzer towed), 185th Arty, Iowa Army National Guard, Clinton, Iowa.

ARTILLERY IN AIR DEFENSE

by
CPT Robert Kimball

As a field artilleryman, I am alarmed over the ever-increasing potential of aircraft. It concerns me that one air-delivered conventional bomb could eliminate the combat effectiveness of an entire unit. The challenge to this air threat in a future conventional war has been given little attention by field artillerymen. This lack of attention is based on the theory that our present air defense system is adequate. The Air Force and the Army air defense artillery, which form this air defense system, propose to reduce the vulnerability of friendly units to air attack.

The Air Force plans the early destruction of enemy airfields and interception of high-performance aircraft in the combat zone. Hostile aircraft that manage to penetrate the Air Force defense system will meet the air defense artillery units. These units will be composed of the Chapparal missile and Vulcan gun systems, which will soon be located at division level. To complement these systems we have the Redeye missile system.

Will these systems provide each unit a significant amount of defense against an air attack? It is the opinion of this writer that in a future conventional war they may not provide an adequate defense system. It is conceivable that in a future conflict tactical air forces will be engaged in heavy combat and will thus provide minimal air support of ground forces. A reduced Air Force defense system would result in greater dependence on our air defense artillery. The resulting dependence would be risky because of the direct fire limitations of the air defense weapons. An even greater threat to air defense systems is technology.

Advances in technology have reduced the effectiveness of surface-to-air missiles. Recent combat experiences indicate that electronic systems placed on high-performance aircraft can limit the effectiveness of ground missile systems. Other electronic systems permit aircraft to lock onto a radar beam and destroy the radar site. This reality illustrates that a future battle of technology could limit electronic air defense systems. The magnitude of the problem increases when we consider that air defense units are always priority targets in conventional warfare. It is interesting to note that artillery air defense systems were planned to counter air attacks by high-performance aircraft. They were not specifically designed to counter air attacks by helicopters.

Since helicopter warfare poses a unique air threat, defenses against helicopter attacks cannot be ignored. Troop-carrying helicopters could deliver an infantry battalion into the rear area of a division zone, where it could completely disrupt the communications and logistics and delay the primary mission of the division. When no air superiority exists and some air defense units are destroyed as priority targets, such an attack would have a high probability of success. The fact that aircraft that use nap-of-the-earth flying techniques would be immune to air defense artillery increases the probability of success of such an attack.

An airmobile battalion could make a surprise combat assault on any objective within minutes after crossing the forward edge of the battle area. Several hundred gunships and support helicopters could join the attack and encounter little antiaircraft resistance. Such a situation would be highly probable if the enemy possessed a helicarrier capability.

Field artillery has the capability to reduce the vulnerability of friendly units to air attacks and surprise massive combat assaults by hostile troops; however, there is no present technique to utilize this capability. Arguments against

such a technique are based on the assumption that our air forces and air defense systems will maintain air superiority. The same arguments insist that when a few hostile aircraft penetrate our air defenses, the battery commander will use his ingenuity to resist them.

Major F. Larionov, a Soviet officer, who participated in World War II, did not believe in total dependence on antiaircraft defense. He held that field artillery could be employed against hostile aircraft. He stated: "Our field artillery is able to protect successfully its own combat formations from blows of hostile bombers. . . . True, the howitzers are slower than the guns in speed, but they exceed them in fire power. . . . It is necessary to open fire with a little anticipation; that is, before the planes reach the orienting points. This is done with the intention that the shell bursts should block the way of the hostile planes, disrupt their combat formation, and force them to jettison their bombs before reaching their target." The firepower Larionov is referring to is the large number of howitzers and ammunition available in a division zone compared to antiaircraft guns like the Vulcan. At present there are 72 assigned artillery pieces in an infantry division but only 24 Vulcans and 24 Chapparals.

Massive field artillery firepower could work as a deterrence to air attacks. It cannot replace air defense units, as there exists almost no probability of aircraft destruction. The objective of field artillery would be the establishment of blocking fires and unsafe air corridors. Larionov states further: "Some commanders evaluate the effectiveness of fire of field artillery on air targets by the number of downed planes. Such a point of view is fundamentally wrong. Field artillery guns do not have special antiaircraft equipment, and thus it is hard to get direct hits on planes. But it does not follow from this that fire of field artillery on hostile planes yields nothing. . . . Practice shows that there is sound sense in using field artillery for fighting hostile aircraft. It is only necessary to organize it well. The commander must not rely entirely on antiaircraft elements. He must also take care of the antiaircraft defense of his own combat formation by the use of field artillery weapons and then hostile attack from the air will have less chance of success."

It is obvious that Larionov believed that field artillery could play a role in antiaircraft defenses. He stated his theory in 1943, 30 years ago. Since that time, technology has increased the range, burst effectiveness, and accuracy of field artillery weapons. Today, a 175-mm gun battery could begin resisting an air attack 20 miles from the battery position. From that same battery, a normal sheaf utilizing high-explosive projectiles and mechanical time fuzes could block an air avenue of approach. (Ed. note: At present, there is no mechanical time fuze for the 175-mm gun.) An 8-inch howitzer battery, with its 200-pound projectile, could accomplish this same task. A comparison of the Vulcan gun, with its less-than-1-pound cartridge, with artillery weapons is unsound. However, the comparison does indicate that the artillery should not sit out an air attack with its firepower or depend on a battery commander's ingenuity to deter such an attack.

Artillery's capability to indirectly engage aircraft beyond the division's air defense units is a significant advantage; however, artillery must locate hostile aircraft to realize the advantage. Two radar systems presently assigned to the artillery can accomplish that mission. The AN/MPQ-4 radar can display 8-digit coordinates and the altitude of aircraft out to ranges of 15,000 meters. This radar (one AN/MPQ-4 is assigned to each direct support battalion) provides immense potential for early detection of aircraft outside the division zone. The second system, found at division artillery, is the AN/TPS-25, which can locate aircraft out to ranges of 18,280 meters. A proposed replacement for the AN/TPS-25 is the AN/TPS-58, which will have a greater capability to track aircraft. In addition to providing location and altitude, the radars can determine the direction and speed of the aircraft. Radar represents one detection means in field artillery. The forward observers throughout the division zone offer an even greater potential for detection of hostile aircraft.

The weapons and detection systems mentioned above are organic to field artillery units. It would not be necessary to add equipment or personnel to realize field artillery's capability to resist air attack; however, this capability is of little use unless some planning is accomplished. The artillery battalion operations officer will have to predict air avenues of approach. These avenues of approach must be established as unsafe air corridors for friend and/or foe. The areas should be sent to radar sections for scanning and/or a target list may be distributed for the approaches. A schedule of fires providing for airbursts at random hours

may be employed when the enemy has the capability to air deliver combat units and bombs into an area of operation.

The field artilleryman will have to become familiar with aircraft characteristics if he is to effectively employ field artillery against aircraft. The response of field artillery would be critical in relation to the speed of attacking aircraft. Radar's ability to locate aircraft at long ranges should provide time for artillery units to establish a screening zone in the path of an air attack. Through the forward observer, the rapid response of the TACFIRE system could provide each infantry company with an instantaneous field artillery air defense system.

Antiaircraft techniques can be developed as a capability of field artillery units. They were effectively used almost 30 years ago in conventional war. The increase in the effectiveness of field artillery weapons and organic radar systems makes antiaircraft techniques more desirable. The adequacy of our Air Force and air defense system in an antiaircraft defense role contains an element of doubt. Field artillery can adopt a method of fire by which the future position of a target is predicted by present position plots and insure that a stipulated number of rounds are fired at each predicted point.

Some research should be undertaken to determine the burst effectiveness of artillery high-explosive shells with mechanical time fuzes on troop-carrying helicopters. Antiaircraft techniques should be developed on the bases of the results of this research and the flight characteristics of hostile aircraft. These techniques could offer the infantry division a backup system to resist an air attack in the absence of the Air Force and air defense units on the battlefields.

CPT Kimball was commissioned from the California National Guard in 1966. He has a Masters Degree in Human Relations from the University of Oklahoma and graduated from the Advanced Course in 1968. He is presently assigned to the Plans and Operations Division of the G-3 Section of the 2d Armored Division, Fort Hood, Texas.

BELVOIR EMPLOYEE EARNS AWARD

An invention cited for contributing greatly to an artillery positioning system, and expected to have broader applications, has won Letters of Patent and a $100 award for Allan Kiisk, U. S. Army Engineer Power Group, Fort Belvoir, VA.

Titled a "Range Change Method of Determining Positions," the invention was developed primarily for artillery use with the Long-Range Position-Determining System currently under development. The award was presented by COL John E. Wagner, Commander, U. S. Army Engineer Topographic Laboratories.

Army Chief of Engineers LTG F. J. Clarke, in a letter to Kiisk regarding the patent, commented:

"Recently completed tests of the first hardware procured for this ground station-to-aircraft computerized electronic surveying system has confirmed its operability, and even exceeded position accuracies. In addition, this invention holds promise as a significant new tool for meeting important needs in broader and more basic conventional applications, such as the rapid performance of third-order surveys, the tracking of aircraft in flight, and the determining of aircraft positions in connection with aerial photography."

Kiisk has a BS degree in electrical engineering from Oregon State University, a master's degree from Stanford University, is a member of the Institute of Electrical and Electronics Engineers, and a registered professional engineer in Oregon.

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SCRAMBLE AUTHORITY: WHO HAS IT?

by COL A. J. Ritchey
USAF

Discussions with Field Artillery School students on the subject of joint air-ground operations indicate that there is considerable misunderstanding and confusion concerning scramble authority for immediate close air support (CAS) aircraft. A few students in each Basic Course class and more in each Advanced Course class, as well as instructors, ask the question, "Who has the authority to scramble CAS aircraft?" The misunderstanding appears to be primarily one of semantics; i. e., the meaning or knowledge of scramble authority at the Tactical Air Control Center (TACC) as opposed to that at the Direct Air Support Center (DASC).

In April 1965, the "Concept for Improved Air-Ground Coordination" was published by the Chief of Staff, US Air Force (CSAF), and the Chief of Staff, US Army (CSA), following their agreement on this concept. The purpose of this concept was to increase the "responsiveness of the system to the immediate CAS and tactical air reconnaissance needs of frontline Army commanders."

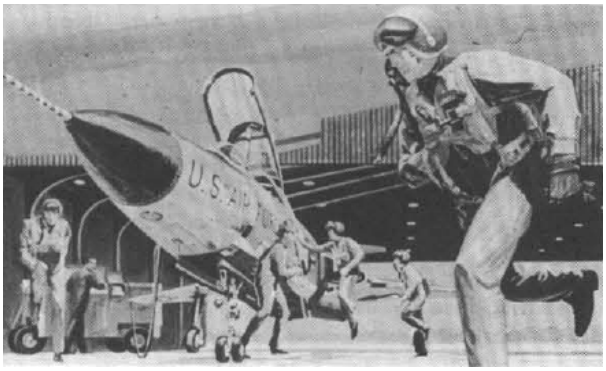
Paragraph 2b of the concept describes the DASC functions: "A primary function is to provide fast reaction to ground force requirements for immediate CAS and tactical air reconnaissance. This facility accomplishes the minute-to-minute coordination between ground force and tactical air elements and is the focal point for the exchange of information on CAS and tactical air reconnaissance missions. The DASC satisfies ground force requests for immediate CAS and tactical air reconnaissance, utilizing sorties allocated for this purpose.

Paragraph 2d(2)(a)1 discusses requests for immediate air support: "The DASC carries out the planning and coordination required to satisfy the request and orders the mission. . . ." (See figure 1.)

Air Force Manual 2-7 (5 Jun 67) contains USAF doctrine on DASC scramble authority. Paragraph 3-6a states: "The TACC allocates sorties to the DASC to satisfy requests for immediate tactical air support. For this immediate tactical air support the TACC passes scramble and control authority over aircraft designated to carry out the sorties so allocated." Paragraph 4-5b(2) repeats verbatim the statement quoted above from paragraph 2d (2) (a)1 of the April 1965 concept. It should be noted that paragraph 3-5 states that communications will be provided between the DASC's and the tactical unit operation centers (TUCC) to enable the DASC to scramble allocated sorties via direct communications.

In a letter dated 17 January 1972 to Air Force commanders, the Commander, Tactical Air Command (TAC) stated the rationale behind retention of scramble authority at the TACC. The following is quoted from that letter:

> "The intent of retaining CAS scramble authority of the TACC level vice the DASC is to be able to provide a faster response to the immediate air requests of the ground forces by having the total air assets of the tactical air force to select from. The DASC, even in a 1 Corps/1 DASC situation, only has knowledge of those tactical missions allocated for CAS in this area of concern. The total air picture is available at the TACC level which makes possible immediate decisions on diverting interdiction or counterair strike aircraft already airborne and bringing up additional fighters at closer air bases."



A second consideration is that the DASC normally is not provided direct communications with all the air bases, although the geographic location of the DASC may in some instances be such that a scramble line to the TUOC might be available. Retaining the scramble authority in the DASC in such instance would limit the ground alert aircraft to that base only. Therefore, in order to give access to all bases, the scramble authority should normally be through the TACC. This does not mean that the TACC would retain the authority to deny the DASC request for scramble for those aircraft already placed on alert and allocated to a particular DASC for immediate CAS requirements; this means only that the TACC would insure that the mission is met by either diverting airborne aircraft or insuring that the scramble instructions reach the appropriate base by reliable communications links.

Army Field Manual 100-26 (Jan 70), paragraph 4-4d(2), discusses immediate CAS requests: "When the request is approved by the corps tactical air support element, the DASC orders the mission flown." On 21 Aug 72, as part of a revision to FM 100-26, Tactical Air Command recommended to the US Army Combat Developments Command that the above sentence be changed to read: "When the request is approved by the corps tactical air support element, the DASC requests the TACC to scramble a portion of the sorties allocated for this purpose or to fulfill the request from other

COL A. J. Ritchey recently retired as the USAFAS Air Force Liaison Officer. He was a double ace in World War II, and a veteran of the Korean and Vietnam conflicts. His awards and decorations include the Distinguished Service Cross. COL Ritchie has earned a BS Degree from the University of Nebraska and an MA from the University of Oklahoma. He has attended the Air Command and Staff College and the Air War College at Maxwell Air Force Base.

than Army allocated resources." The rationale given for this change conformed to that stated in the TAC Commander's letter of 17 January 1972.

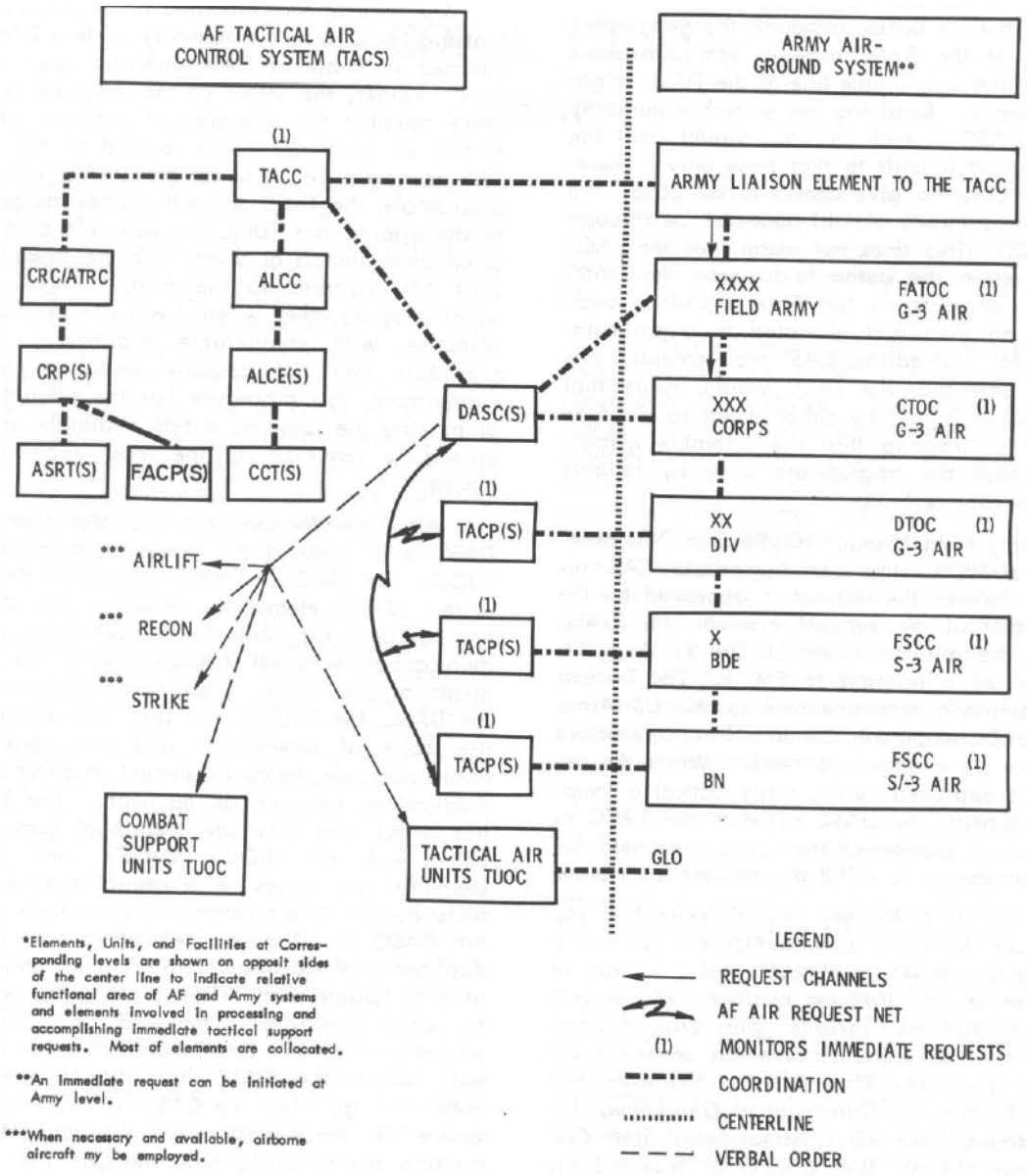
The obvious focal point of confusion is the fact that, whereas the DASC is delegated scramble authority by the 1965 CSAF/CSA agreement as well as current doctrine publications, the TAC, by the language used, indicates that scramble authority for CAS immediate missions is held at the TACC. This contradiction, centering on the meaning of the term, "scramble authority," is less substantive than it seems for the following reasons:

The Tactical Air Command is not proposing that the TACC have the authority to deny DASC-initiated scramble of DASC-allocated alert aircraft. Rather, the intent of the proposal is to make possible the diversion of airborne interdiction or counterair strike aircraft to fill the CAS request. Thus, when the DASC initiates a scramble, the TACC will either pass the order to the appropriate TUOC for scramble of allocated alert aircraft or divert airborne strike aircraft not allocated to the Army. This latter action may be taken when it will provide faster response with comparable ordnance. This procedure will not degrade response times. Furthermore, this procedure has the advantage of making the total air assets available to fill immediate requests via the most expeditious means.

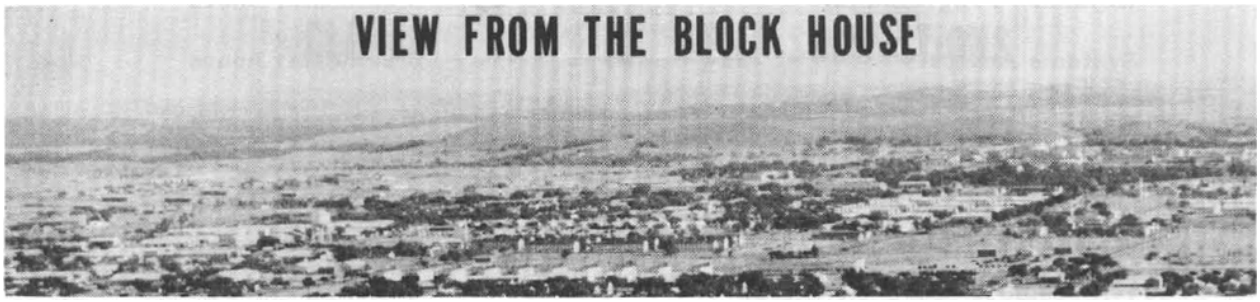
Air Force Manual 2-7 indicates that the DASC will have direct communications with TUOC's, the TACC, and other tactical air control system (TACS) elements. However, the DASC has not been programmed to have direct communications with **all** TUOC's and/or all elements of the TACS. Geographic locations of the DASC, the TUOC's and the TACS elements; the scope of operations; and cost considerations preclude the establishment of direct communications between all elements. The TACC has direct and alternate means of communication with all TUOC's, DASC's, and TACS elements and serves as a central communications point. Direct communications links from the DASC to all other elements would be a duplication of existing communications channels at considerable cost. Thus, passing the scramble order directly from the DASC to the TUOC would limit ground alert aircraft to those bases with which the DASC has direct communications, e. g., when the DASC is located on an active Air Force base. On the other hand, passing the scramble order through the TACC not only insures that the scramble instructions

will reach the proper base via reliable communications links but also increases the number of bases that can be used for ground alert. This latter procedure would not result in increased scramble times. On the contrary, the capability to divert nonallocated airborne aircraft would result in shorter average response times to immediate requests.

In summary, routing DASC-initiated scramble of DASC-allocated sorties through the TACC is in consonance with the basic objective of the immediate CAS request system; i. e., rapid response to the ground commander's requirements for immediate close air support. Nothing has been subtracted from the existing system. The Army commander still has the authority to direct scramble of his allocated alert sorties through the DASC. In addition, he also has the potential for getting a faster response to his needs by TACC diversion of any non-Army-allocated portion of the total air assets of the tactical air force. This results in a more efficient, less costly operation capable of faster response to immediate requests for close air support.



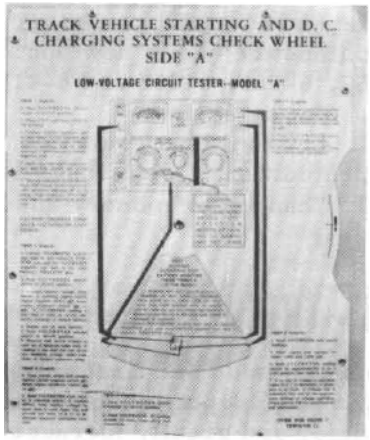
Request Channels for Immediate Tactical Air Support (TAS)



LVCT JOB AID

A Materiel and Maintenance Department instructor, Mr. W. A. King, has constructed a device for use with the Low Voltage Circuit Tester (LVCT) and a similar device for use with the multimeter.

The LVCT job aid consists of a rotatable wheel sandwiched between two vinyl plastic sheets, or sides, labeled "A" and "B." On the upper portion of each side is a reproduction of a low-voltage circuit tester panel, on the lower portion is a wedge-shaped window through which a section of the rotatable wheel may be viewed. The panel and window are connected by color-coded lines representing test leads. As the wheel is rotated, six test schematics, complete with colored test lead connections and instructions for the conduct of each test, are presented on each side. Lengthy test instructions are contained on the cover sheets, which are impervious to fuel, lubricants, and standard solvents. Using the LVCT job aid as a sole reference, a trained mechanic can perform the 12 tests that enable complete troubleshooting of the batteries, the starting system, and the direct current charging system of a tracked vehicle. The LVCT job aid also enables improved accuracy and a reduced expenditure of time.



The Combat Arms Training Board (CATB), Fort Benning, Georgia, has placed on contract an order for 125 models of the LVCT job aid. Some of these models will be distributed by CATB for testing purposes; 46 devices are programed for the Field Artillery School and Fort Sill units, and 36 devices will be made available to the Armor School, Fort Knox, Kentucky, for school and unit testing. The remaining devices will be retained by the CATB. An estimated availability date has not yet been announced.

The multimeter check wheel is similar to the LVCT job aid and is used in the same manner, the difference being that the LVCT job aid is used to check components of vehicles equipped with direct current electrical systems and the multimeter check wheel is used to check components of vehicles equipped with alternating current electrical systems. A few models of the multimeter check wheel have been constructed by Training Aids Services Office, Fort Sill, and these will be tested by students in the Materiel and Maintenance Department. The check wheel has been forwarded to the US Army Tank-Automotive Command for evaluation.

ELECTIVES PROGRAM

Cameron College, Lawton, Oklahoma, has evaluated the FAOAC elective instructors as well as the POI's and has granted equivalent credit for a number of in-house electives. Officers attending the Advanced Course may now receive equivalent college credit from Cameron College as indicated for the following FAOAC electives:

Advanced Programming	3 semester hours
Systems Analysis	3 semester hours
Applied OR/SA in Management Science	3 semester hours
OR/SA Tools for Management Science	3 semester hours
Meteorology	2 semester hours
Management of Human Assets	3 semester hours
Politico-Military Activties	2 semester hours

On 28 March 1973, Cameron College was accredited by the North Central Association of Colleges and Secondary Schools; thus, the credentials and transferability of these electives have been enhanced accordingly.

CHANGE TO CANNON ATT'S

Many changes have been recommended for cannon ATT's by units in the field and the Field Artillery School. A current regulation has required a complete revision of the field artillery ATT's presently in use. Completion of the revisions will require two or three years for all cannon ATT's. As an interim measure to allow field artillery cannon battalions the use of new doctrine and procedures, changes will be published for ATT's 6-155, 6-157, 6-165, 6-358 and 6-415. The changes affect the following general areas of the ATT's:

a. Rating system.
b. Ammunition requirements and missions.
c. Addition of electronic warfare evaluation.
d. Changes to gunnery and survey accuracy tables.

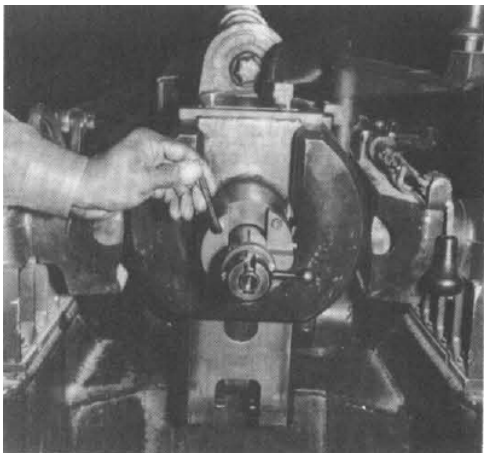
M31 TRAINER

The U. S. Army Training Device Agency has developed a new adapter for the M101A1, M102, M109, M109A1, M110, and M114 howitzers so that the M31 (14. 5-mm) artillery trainer can be mounted inside and fired through the bore of each weapon.

The new adapter enables the crew to use the on-carriage fire control equipment of the howitzer and greatly increases realism.

New software has also been developed. A FADAC tape and graphical tables for the weapon allow realistic solutions to gunnery problems.

A new User's Manual for the M31 is also being drafted. The manual will give full details on mounting the adapter, creating ranges, and will include training trips.



The adapter kit will be available for issue through training aids centers to units. Overseas battalions are scheduled to start receiving these adapters in December 1973. Procurement of additional barrels and other equipment may result in some CONUS units, to include National Guard and Reserves, receiving the adapters as late as March 1975.

During the second quarter, FY 74, an information letter will be published outlining the range requirements and construction of a range.

Basis of issue will be one M31 system of 6 adapters per battalion.

CLOTHING AND EQUIPMENT SUGGESTIONS

The Field Artillery School is concerned that field artillerymen may not be clothed and equipped in an optimum manner. In the past, development of individual items of clothing and equipment has been predicated primarily on the needs of the infantrymen. The philosophy has been "if it is adequate for the infantry, then it will work for the field artillery." We all know that this is not necessarily the case. The needs of field artillerymen are often quite different from those of the infantry. Therefore, the School is investigating this problem and plans to ultimately recommend changes in clothing and equipment deemed necessary. Sitting in a comfortable office at Fort Sill is not really the best way to determine the user's needs in clothing and equipment. We at the School are interested in learning what the man in the field needs. We want to know in what areas present equipment is not adequate and what new items are needed. We are depending on you, the field artillerymen, to give us your ideas. Following are some of the thoughts we have received so far.

Fatigues, Boots, Hats: The field artilleryman currently is required to wear the same field uniform on a daily basis, regardless of the weather or season of the year. A requirement exists for summer-weight and winter-weight field uniforms.

Fire Retardant Clothing: Records reflect several accidents in which burns have been sustained by M109 crewmembers. These burns resulted from propelling-charge fires inside the track and possibly could have been avoided if the crewmen had been wearing uniforms of nomex or some similar material.

Gloves: Gloves are required to provide warmth while permitting ease of movement necessary for accurate manipulation of sights, fuze setters, gunner's quadrants, aiming circles, and similar items of field artillery equipment.

Stop Wristwatch: A wristwatch with a stopwatch capability would be useful to both forward observers and fire direction officers. The watch would improve the accuracy of fire direction time requirements.

Survey Wristwatch: Field artillery survey teams need wristwatches of sufficient accuracy to allow teams to conduct astronomical survey.

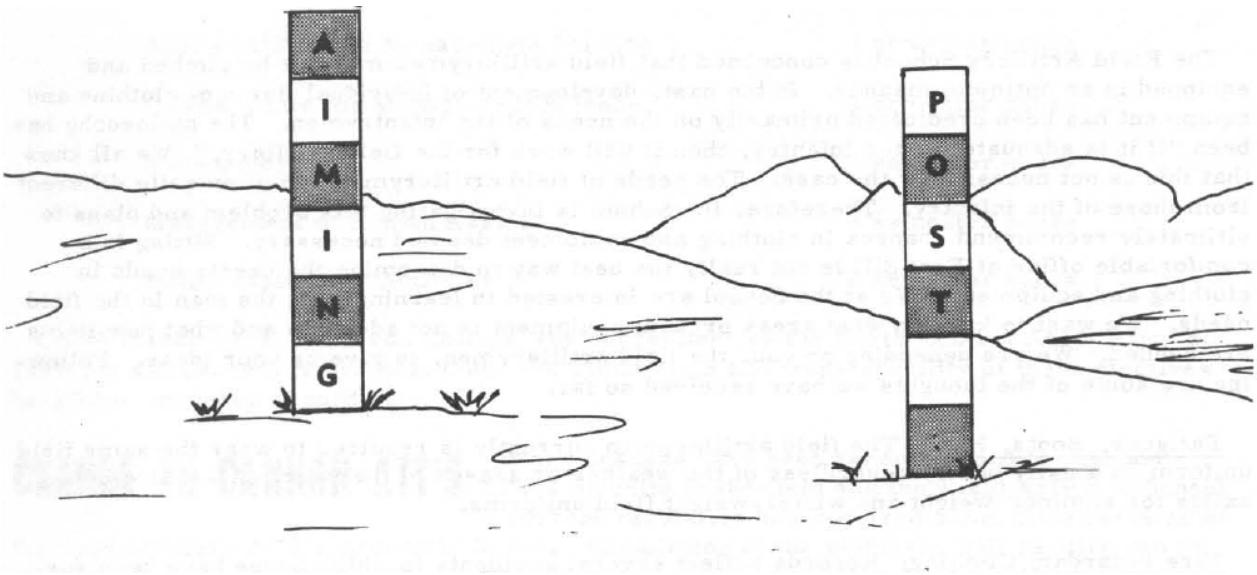
Lightweight Camouflage Net: An extremely lightweight net would give the forward observer the capability to instantly camouflage his position.

Wrist Compass: A simple expendable wrist compass, graduated in mils, would be desirable to replace the lensatic compass now issued to the observer. Such a compass would facilitate gross direction finding by the observer.

Weapon: The M16 weapon is too cumbersome to be transported inside a tracked vehicle. A more compact weapon with the folding stock similar to the CAR 15 is needed.

Executive Post Shelter: A small, lightweight, camouflaged shelter for the battery executive post would be highly desirable. During inclement weather the executive post must be enclosed to allow the battery recorder to properly maintain his records.

No formal communications are necessary; just jot down your thoughts on a piece of paper and mail it to Commandant, USAFAS, ATTN: ATSF-CTD-ML, Fort Sill, Oklahoma 73503. Let us hear from you soon as we all join together in this effort to improve the individual clothing and equipment of field artillerymen.



BY

MAJ KENNETH INGRAM

One of the major achievements of high officials within the Department of Defense during the 1960's was to create an awareness of cost consciousness. Coincident with cost emphasis was reemphasis of the position that the Army should get a dollar's worth of equipment for every dollar spent and that all equipment should be functional. The above thoughts lead me to write about the artillery aiming post—a device that is essential to the artillery battery, that has been in service for a number of years, and that has certain inherent limitations.

First, the post must be driven into the ground or supported by improvised devices to remain erect. Second, the post incorporates an externally mounted night lighting device that has proved to be highly inefficient.

The first deficiency may appear to be somewhat exaggerated in that we rationalize that anyone can drive a stick into the ground. Unfortunately, the soil in many of the varied locations throughout the world where howitzers are emplaced will neither readily accept nor support an aiming post. In the arctic, the soil is frozen during a large portion of the year. In the temperate zone, the soil is frozen during the winter and during the summer is often dry and hard. In the tropics, the soil often becomes so saturated during the rainy season that it will not support the post in an upright position and during the dry season is so hard that the post can be implaced only after the soil is conditioned with an auger. These difficulties have not taken into account rocks, asphalt or improved roads, metal debris, man-made bunkers, and other impediments that frequently are present at points where it is desirable to implace the aiming post.

To overcome such difficulties, many gun crews have devised field expedients that minimize the limitations of the aiming posts but are sometimes highly destructive. Because of the destructive nature of these expedients, many gun crews habitually maintain one or two extra sets of aiming posts.

One field expedient is to drive the aiming post into the ground with a hammer. This technique works well in most instances but has some disadvantages. First, the soft metal of the aiming post is readily deformed by the battering of the hammer. For the near aiming post, this deficiency is not so serious. The far aiming post, however, is often ruined, since the deformed metal precludes adding the essential top portion of the aiming post to the section that is driven into the ground. Occasionally, the ground is so hard that insistent battering results in total destruction of the post as it collapses under the strain.

The blows of the hammer can be buffered with a section of 2×4 planking, however, use of this technique usually results in a number of split 2×4's. Occasionally, metal collars fabricated in ordnance machine shops are used instead of 2×4 plank. This solution is superior to using the 2×4 in that the buffering action of the collar usually saves the top of the aiming post from destruction. Insistent hammering, however, will usually collapse the post if it is being implaced in hard soil.

A crew can carry a portable base into which the aiming stake can be secured. These bases may be in many forms and will vary with the ingenuity and imagination of the gun chief. Figures 1 and 2 illustrate use of the most common type—a sandbag. The sandbag works exceptionally well for the near post, since this post is not so topheavy as the taller far post, which must be secured with several bags to preclude it from falling. Other common types of bases are tin cans from the mess hall, oil containers from the motor pool, and small-arms ammunition boxes. These containers are usually filled with soft dirt or sand.

A crew can construct an improvised lighting device. Figures 2, 3, and 4 show versions of improvised lighting devices. Although slight variations are apparent, all lighting devices possess a similar characteristic in that they are wired to an external power source. Observation of these pictures also indicates that maintaining a well-painted aiming post poses a problem. Reasons for failure of the currently authorized night lighting device center around two deficiencies.

One problem is metal corrosion. Prolonged exposure of the device to the elements results in moisture leaks, which, in turn lead to deterioration of the battery and subsequent corrosion of the metal battery compartment.

A second problem is inadequate battery life. This deficiency could be defined as a lack of sufficient batteries to maintain prolonged operation of the lights. The BA30 is probably the most common battery in use today in the US Army. It does not, however, have sufficient staying power to work satisfactorily for periods in excess of 48 hours. Because of this limitation, artillery units must carry large reserves of the BA30 in order to maintain continued operatinon of lighting devices. Realistically, these reserves are usually not available and the unit is forced to use other means. More often than not, the alternate power source turns out to be either a BA225 or a BA386 (PRC-25

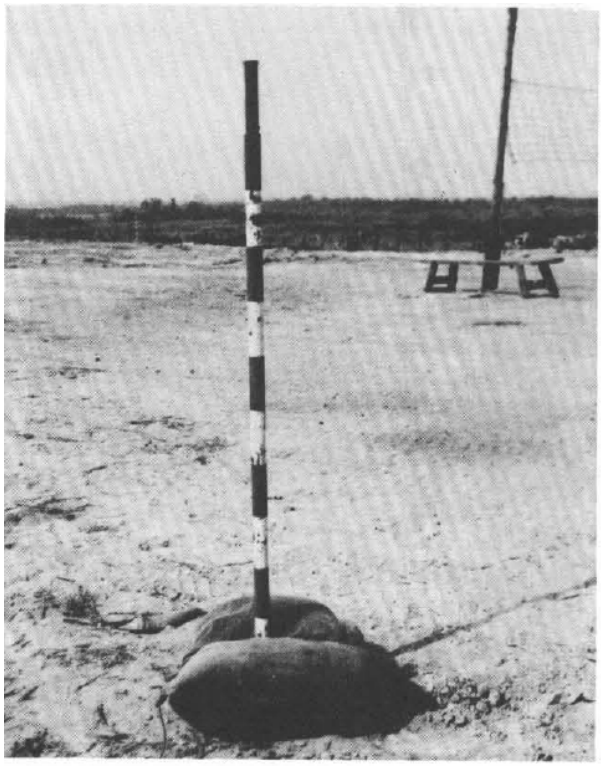


Figure 1.

Figure 2.

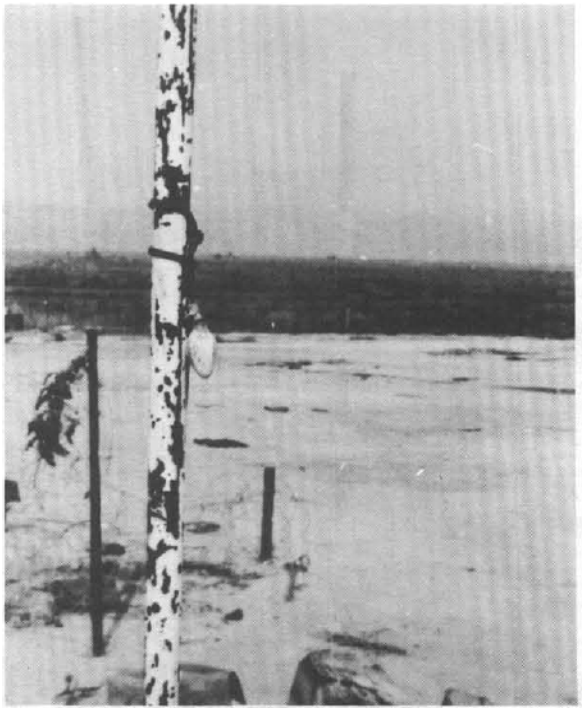


Figure 3.

Figure 4.

battery). Both of these power sources are considerably larger than the BA30 and therefore, have longer staying power. The wire used for the electrical connection usually comes from an expended Claymore mine. Crude as these auxiliary devices are, they are functional.

The photographs shown as figures 1 through 4 were taken in the Republic of South Vietnam. Were it not for such field expedients, artillery batteries of the 5th ARVN Division Artillery would be unable to maintain continuous field operations. These expedients, however, are not peculiar to ARVN artillery batteries.

Similar lighting devices were used in varying degrees by many US artillery batteries in South Vietnam, and the portable base expedients are now used by artillery batteries located throughout the world.

It is apparent that the US Army needs an improved aiming post that is functional, rugged, and economical. This need was previously recognized, and, as a result, the infinity aiming device, collimator, M1, was developed. Although it represents an innovation in the field of fire control, the collimator is neither **rugged** nor **economical.** My intention is not to knock the collimator but to point out that US troops made modifications to its lighting system almost immediately after it was fielded. In addition to being somewhat fragile, the power cord connecting the control box to the collimator was found by US artillerymen to be highly susceptible to unwary foot traffic around the gun. Consequently, many power cords were soon damaged or destroyed and gun crews started collecting extra collimators to insure availability of a serviceable aiming post. Although the artillery aiming post concept has always been fundamentally sound, the collimator, an MBT 70 approach to a basic fire control problem, was developed as opposed to improving a time-tested technique.

It is my contention that, in the interest of simplicity, functionability, economy, and maintainability, there are other aiming post designs better suited to the needs of the artillery than is the collimator. One simple design that satisfies necessary specifications is proposed as follows:

a. Construct the aiming post from fiberglass that is colored to meet specifications during the manufacturing process. Fiberglass offers the following advantages.

(1) It is rigid, yet flexible enough to withstand lateral stresses that buckle the conventional aiming post.

(2) Because fiberglass is noncorrosive, the post will not require repainting.

b. Construct a simple base into which the post may be inserted and that will hold the post firmly in place. This base could also be constructed from a noncorrosive material. In considering other designs, the Army would do well to evaluate tent poles developed by manufacturers of camping equipment and camera tripods marketed by several manufacturers of camera equipment. Basically, the final design must meet the following specifications:

(1) It must support the aiming post.

(2) It must provide a capability for cant correction.

(3) It must allow attachment of an electric power source for the night lighting device.

The sketches shown at figures 5, 6, and 7 illustrate a design that meets these requirements. First, the aiming post is inserted into a groove bored into the ball portion of a ball-and-socket joint (fig 5). Next, the socket portion is secured to the base, and the ball (post) is secured in a vertical position by using two thumb screws located on opposite sides of the socket. The battery case is then attached to the base. The lighting device, which is merely a light bulb housed inside the aiming post (fig 6), is provided with power by attaching the wire connections. A screw-on cap on the top of the post permits easy repair or replacement of the light bulb and precludes entry of moisture. The lighting device is placed inside the aiming post from the top (fig 7). This device is fabricated entirely of a noncorrosive substance and uses metal parts only as required for conduction of electricity. The protective cover, constructed of transparent fiberglass colored either red or green, screws onto the top of the post.

Although a simple device, the aiming post is an important item of artillery equipment and has proven reliable and accurate. It's shortcomings are associated with implacement and maintenance—not with accuracy. It is the opinion of the writer that, notwithstanding some advantages, the collimator does not meet the requirements of simplicity, ruggedness, and maintainability. In the interest of cost consciousness, serviceability, and simplicity, an improved aiming post, as described in this article, is required by the artillery to accomplish its fire support mission.

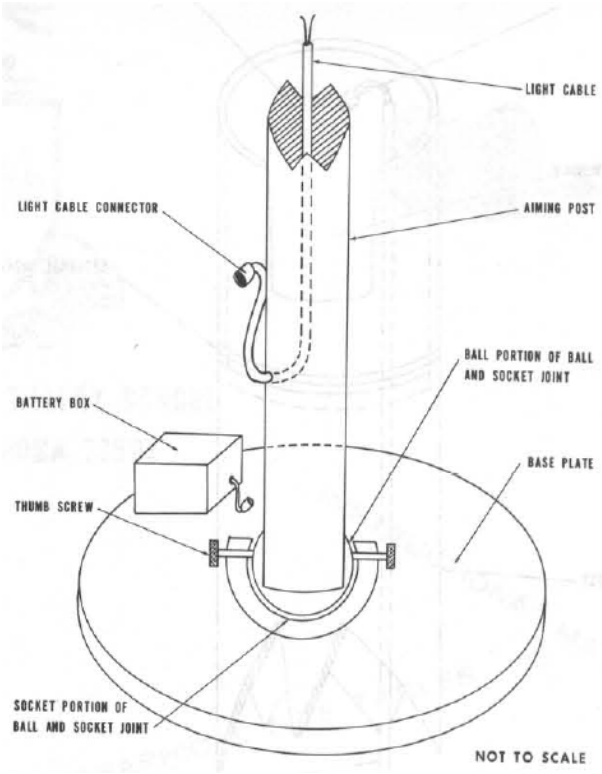


Figure 5.

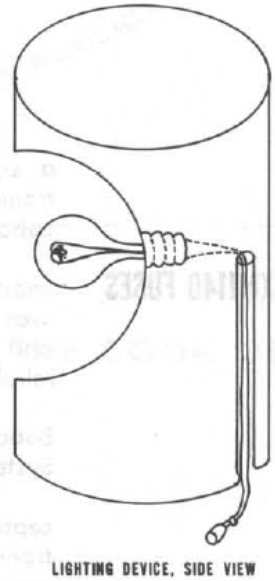


Figure 6.

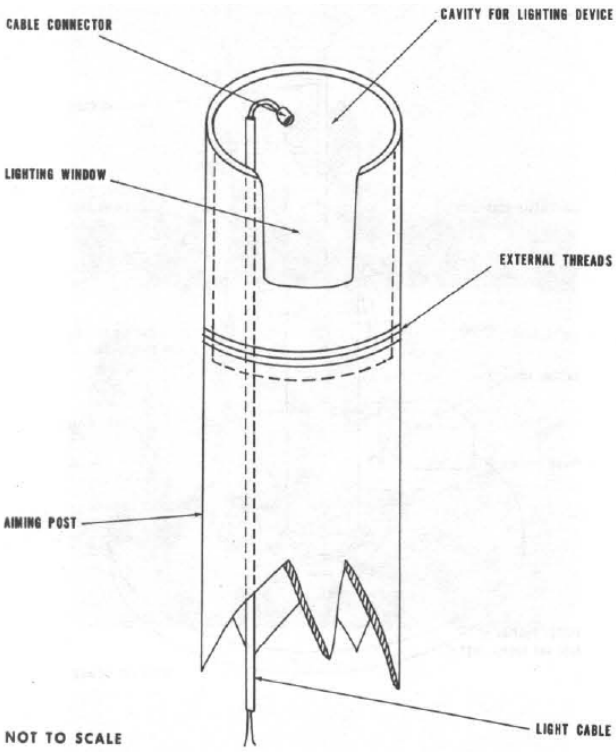


Figure 7.

Should the Artillery Board or any other agency decide to test this concept, I suggest that the following additional aspects also be considered:

a. Would accuracy be sacrificed if the prescribed distance between aiming posts was reduced to less than 50 meters?

b. How relevant is the size of the current aiming post? Could its size be reduced so that the far post could be constructed in a single section and not be unwieldy?

Like the foresight of the commander who instructed his engineer to construct new sidewalks where troop foot traffic had already worn many paths, this same approach can readily be applied when considering a new design for an aiming post. Artillerymen have worn many distinguishable footpaths, what now must be done is to construct the sidewalks.

MAJ Kenneth Ingram wrote this article while he was an advisor to the 5th ARVN Division, RVN. He served a tour with the 1st Infantry Division Artillery during a previous Vietnam assignment. MAJ Ingram has also spent three years in Germany serving in various battery positions from forward observer to battery commander.

ARMY TESTS XM1140 FUSES

Successful first article sampling of the XM1140 fuze, termed a significant upgrading of the state-of-the-art in military electronics, has been announced by the U.S. Army's Harry Diamond Laboratories (HDL).

The project for development of the XM1140 airburst fuze for shortrange as well as extended-range systems of the Lance missile was initiated in the late 1960's. HDL engineers had designed and field tested by the end of 1971 what proved to be a highly reliable fuzing system.

Early in 1972 HDL procurement officials contracted with Babcock Electronics Corp. and Melpar Division of LTV Electro Systems to produce the XM1140 fuze to meet Army requirements.

The contract committed HDL to deliver two Lance Final Acceptance Testers to each of the fuze producers. Complex electronic assemblies composed of many standard and modified commercial instruments and custom-fabricated elements were used.

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MULE ARTILLERY

Out in a certain western fort, some time ago, a major conceived the idea that artillery might be used effectively in fighting with the Indians by dispensing with gun carriages and fastening the cannon upon the backs of mules. So he explained his views to the commandant, and it was determined to try the experiment.

A howitzer was selected and strapped upon an ambulance mule, with the muzzle pointed toward the tail. When they had secured the gun, and loaded it with ball cartridge, they led that calm and steadfast mule out on the bluff, and set up a target in the middle of the river to practice.

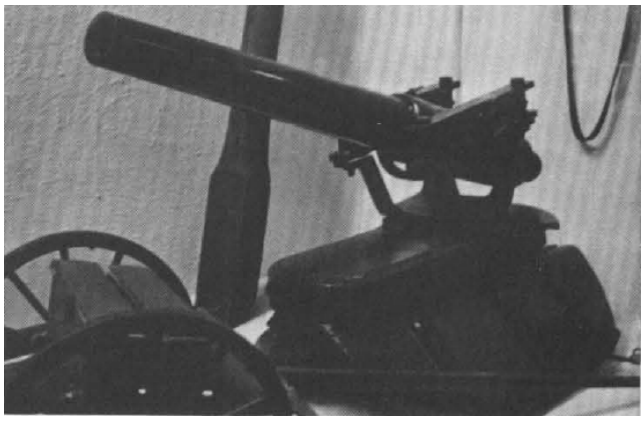
The rear of the mule was turned toward the target, and he was backed gently up to the edge of the bluff. The officers stood around in a semicircle, while the major went up and inserted a time fuse in the touch hole of the howitzer. When the fuse was ready, the major lit it and retired.

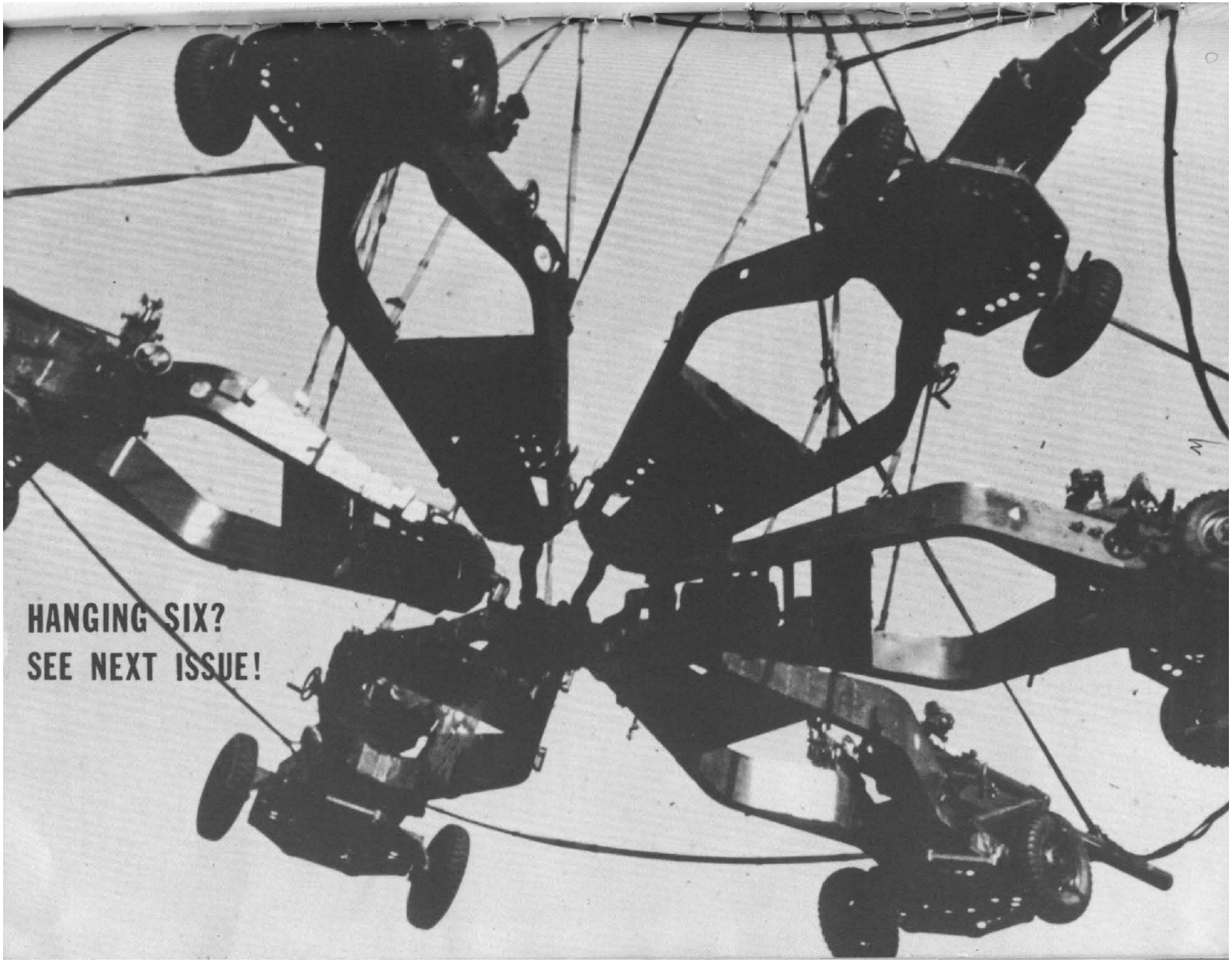
In a minute or two the hitherto unruffled mule heard the fizzing back there on his neck, and it made him uneasy. He reached his head around to ascertain what was going on, and the howitzer began to sweep around the horizon. The mule at last became excited and his curiosity became more and more intense, and in a second or two he was standing with his four legs in a bunch, making six revolutions a minute, and the howitzer threatening sudden death to every man within half a mile. The commandant was observed to climb suddenly up a tree; the lieutenants were seen sliding over the bluff into the river, as if they didn't care at all about the price of uniforms; the adjutant made good time toward the fort; the sergeant began to throw up breastworks with his bayonet, and the major rolled over on the ground and groaned. In two or three minutes there was a puff of smoke, a dull thud, and the mule—Oh, where was he? A solitary mule might have been seen turning somersaults over the bluff, and land finally, with the howitzer at the bottom of the river, while the ball went off toward the fort, hit the chimney of the major's quarters, and rattled the adobe bricks down into the parlor, frightening the major's wife into convulsions. They do not allude to it now, and no report of the results of the experiment was ever sent to the War Department.

This story was called to our attention by CPT Jeff Fisher, USAR, Murfreesboro, Tennessee. The article was first published in ENCORE magazine then in the INFANTRY JOURNAL in 1945. We have reprinted it with the permission of INFANTRY magazine.

At first glance it seemed to be just a humorous story. At the urging of CPT Fisher we checked with the Fort Sill museum and, lo and behold, there was a US Army gun, mule, 1.25" (1-pounder), on saddle tree (experimental). The historical records were sketchy as to the origin of the weapon as it was on hand when the museum was officially founded in 1934. The weapon is a rifled muzzle-loader, 29 1/4 inches long with nine lands and grooves.

Perhaps some of our readers can enlighten us on the history and/or mystery of the mule-mounted artillery.—Editor.




HANGING SIX?
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