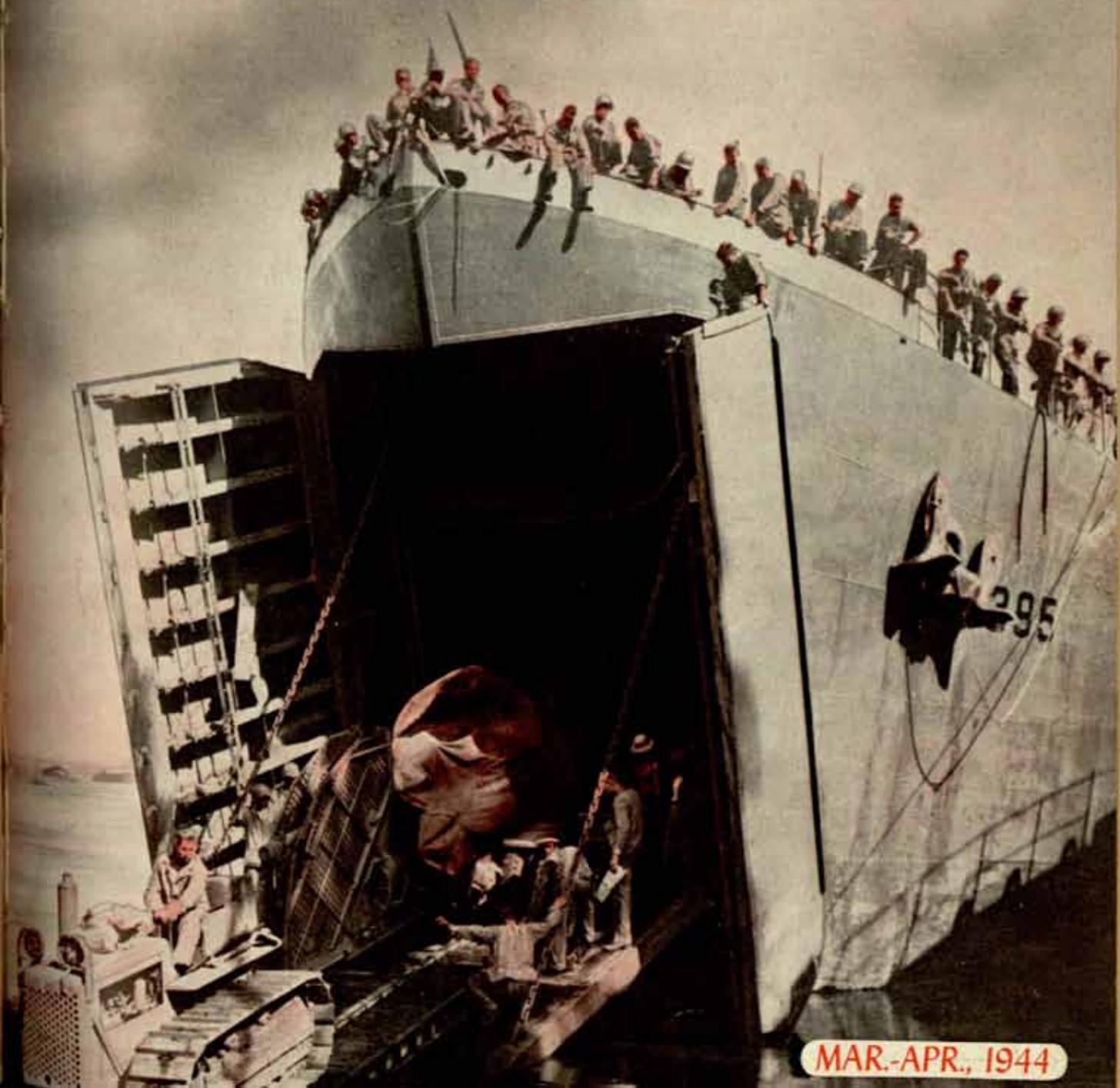


# COAST ARTILLERY JOURNAL



MAR.-APR., 1944

# COAST ARTILLERY RINGS



Due to difficulties in the supply of gold, the JOURNAL in the past has been forced to disappoint many who ordered Coast Artillery rings. GOLD IS NOW AVAILABLE—we don't know how long this will be true. If you want a Coast Artillery ring, ORDER NOW! These rings are made to order, they are of heavy construction, and are made by one of America's leading manufacturing jewelers. Your name is engraved free.

Order your rings NOW because:

We do not know how long gold will be available.

Shipments overseas are at purchaser's risk. Six to eight weeks are required for manufacture.

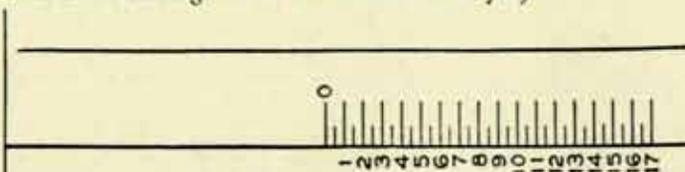
A COAST ARTILLERY RING WITH YOUR NAME ENGRAVED IS A READY MEANS OF IDENTIFICATION

## PRICES

	Price	Tax	Total
Onyx Setting .....	\$27.00	\$5.40	\$32.40
Tourmaline Setting .....	29.00	5.80	34.80
Alexandrite Setting .....	29.00	5.80	34.80

Miniatures with stone settings will be available about July 1.

Measure from this point



Take 1/4-inch strip of paper and wind around desired finger. Size may then be determined by measuring on printed gauge.

Since these rings are made to order, it is necessary to require check or money order before work is begun.

# The OOZLEFINCH

PATRON BIRD OF THE COAST ARTILLERY CORPS

You'll want a pair for your desk both in camp and at home—and they make unusual gifts, in the authentic Coast Artillery Corps tradition.



Single Figure ..... \$1.00

Pair (Facing Opposite) ..... \$1.75

(POSTAGE PREPAID)

IN SPECIAL MAILING BOXES

# COAST ARTILLERY JOURNAL

FOUNDED IN 1892 AS THE JOURNAL OF THE UNITED STATES ARTILLERY

VOLUME LXXXVII

MARCH-APRIL, 1944

NUMBER 2

## CONTENTS



COVER. <i>AA Gun Landing at Rendova. Marine Corps Photo.</i>	
AUTOMOTIVE MAINTENANCE PROGRAM. <i>By Captain Milton H. Mater</i>	2
EFFICIENCY REPORTS. <i>By Major General C. D. Herron</i>	10
ROCKET TARGETS FOR AA ( <i>Pictures</i> )	13
AN AA BATTALION IN SWPA. <i>By Lieutenant Colonel A. Lester Henderson</i>	14
A TRAINING CAMP IN CORNWALL. <i>By Lieutenant Harold R. Daniels</i>	17
THE JOURNAL NEWSREEL ( <i>Pictures</i> )	20
GUN COMMANDER'S ACTION FOR 155MM GUNS. <i>By Lieutenant Colonel Wilmans K. Ballough</i>	22
CABLE LAYING: A SOLUTION. <i>By Captain John P. Buck, Jr.</i>	25
BRITISH AGAINST GERMANS. <i>By General Sir Bernard Law Montgomery</i>	29
WHAT IS YOUR DEAD TIME? <i>By Major George A. Hoffmann</i>	31
THE EUROPEAN FORTRESS	33
THE ATTACK TEAM STRIKES. <i>By Captain Frank Menacker</i>	35
GRAPHICAL ANALYSIS FOR AW FIRE. <i>By Lieutenant Colonel Bradley M. Cooper</i>	36
FIRE ADJUSTMENT FOR RAPID-FIRE BATTERIES. <i>By Sergeant Charles Wegener</i>	39
TRAINING AID FOR 155MM BATTERIES. <i>By Captain U. S. Jones, Lieutenant J. M. Jarvis, and Lieutenant M. E. Bishop</i>	40
ROTC MEDAL WINNERS	41
EMERGENCY TIME INTERVAL DEVICE. <i>By Lieutenant Robert J. Barnard</i>	42
BLINKER SPOTTING SYSTEM. <i>By Lieutenant Wallace A. Hopkins</i>	44
SIGHT DISPLACEMENT RULE. <i>By Lieutenant Clyde W. Beebe</i>	46
POLARIS ORIENTATION CHART FOR THE NORTHERN HEMISPHERE. <i>By Lieutenant Colonel John Parmakian</i>	51
COAST ARTILLERY IN ACTION	56
COAST ARTILLERY BOARD NOTES	59
NEWS AND COMMENT	62
NEWS LETTERS	71
BOOK REVIEWS	85

PUBLICATION DATE: APRIL 1, 1944



# AUTOMOTIVE MAINTENANCE



Concentration of vehicles at Youks Les Bains, North Africa. Terrain like this is the final test of preventive maintenance.

An army does more marching than fighting. Translated into Antiaircraft terms, this means that a mobile AA unit does more moving than shooting. A great part of our tactical employment depends on our ability to roll to a selected position as speedily and efficiently as possible. After we set up, we may never fire a shot. A good deal of the time our presence acts to discourage enemy attacks. In one of our set-ups, for instance, we were able to see the tracers and hear the explosions of a battle between enemy aircraft and a convoy of ships not thirty miles from the port we were protecting; yet in this port were vessels and extensive dumps which the enemy did not care to attack in the face of our guns. We may never fire a shot from the position we set up in, but we will need our vehicles to roll to the next position and also to feed and supply us while we are static.

Keeping our vehicles in condition to roll at any time is a big job, yet a job only "in addition to your other duties." Take the case of a mobile Automatic Weapons Battery. It has twenty-five vehicles on which it is absolutely dependent, not only for mobility as a unit, but also for obtaining and distributing food, water, ammunition and fuel to the gun sections after they have finally taken up their assigned positions.

Since the shop truck is with the Headquarters detachment, and since the grease pit or rack is put near the headquarters section also for convenience, it is only natural that the battery executive will become the battery motor of-

By  
CAPTAIN MILTON  
H. MATER

Coast  
Artillery  
Corps

# MAINTENANCE PROGRAM

ficer—"in addition to his other duties." The executive, even if he has never lifted the hood of a car in civilian life, now finds himself saddled with a highly technical and tactically important job. To make matters worse, his unit may never have received its full complement of vehicles till it left the training camp, and he may find himself taking over an unorganized motor pool with only a semi-trained crew. His newly issued vehicles which give practically no trouble may lull him into a false sense of security and encourage him to forget about his motor pool, but not for long. In two or three months his breakdowns will start. He'll find himself without a gun section or two at the end of a long trip, or find that when he gets orders to move suddenly, the motor pool reports that one or two vehicles are "deadlined."

This program is based on three assumptions which have been found to be true in our own outfit and also in the various separate battalions which have been attached to us at various times. First, that the battery mechanics have attended some

service or other motor schools and have a good background in automotive work; second, that the battery motor officers have been handed this job in addition to their other duties and have not the background or training that will enable them to supervise their mechanics; and third, that the battalion or regimental Motor Transportation Officer can handle the technical end of the program outlined below.

The program is one of decentralized schools and inspections and can be broken down and described as follows:

I. *The Instructing Program.* This includes theoretical classroom work for all the motor officers and practical work on vehicles by both officers and mechanics.

II. *The Inspection Program.* This is a program of continuous inspection and correction which is so necessary for any maintenance program.

III. *The Economy Program.* This is a practical application of the very necessary antiwaste program in the field.

Motor Transportation Officer teaches practical work—lubrication of a bearing, in this case.





"It takes constant checking on the part of an officer to keep these men on the straight and narrow path of the maintenance bibles."

### I. THE INSTRUCTION PROGRAM

When we were stationed at Casablanca, we gave instruction to various French units which would detach an officer and about twenty men to us. The group I drew to instruct in Motor Transportation had no one in it who could "parler Anglais," and I had only learned a few words of French. However, the French Lieutenant with the group could speak some German. So could I, so we made shift somehow. But because I couldn't lecture to his men, we adopted the system which is the basis of our present regimental maintenance instruction program. The French officer and I would go out together in the morning and work on the planned lesson for that day, then in the afternoon he would take his men out on the trucks and pass the instruction down to them. The system seemed to work out quite well. Of course he was mainly interested in teaching his men to drive our trucks and in driver maintenance, so some modifications were made when the program was adapted to our more technical work.

This system of decentralized instruction is particularly suitable for automotive maintenance because: 1) By the nature of mechanical work, it is best taught under close supervision; that calls for the smallest group possible. 2) Keeping up a maintenance program is a matter of battery discipline and training, therefore it is a subject for a battery officer to teach. 3) The mechanics will have more respect for an officer's inspection and criticism if they know that he is capable of teaching the subject he inspects.

We use the following instruction system: On Monday night, we have an hour and a half class on the more theoretical aspects of motor maintenance, which is attended by all the battery and battalion motor officers. Our textbook is a maintenance manual from one of our vehicles; discussion and expression of individual opinion is welcomed. The main purpose of these meetings is to develop *esprit* in motor maintenance work. It is like a professional society meeting. Technical questions in the maintenance field are discussed and solved or left open for practical investigation. The meetings inculcate a group feeling for this one phase of the officer's duties. Instead of being just another

one of the endless details of an officer's day, the work becomes a hobby to him. I see these meetings as their animated discussions of minor technical details as a sort of "Hobby group," such as the officer might well long to in his normal life. And for an officer who must spend an hour or half hour each day looking over his motor pool—"in addition to his other duties"—it is well for maintenance to be a hobby which he enjoys.

Another reason for the classroom work is that the officers gain a familiarity with the books and technical manuals used by his mechanics—a familiarity which is difficult to gain in the short periods of time used for maintenance instruction if all the activity is held to practical field work only. The familiarity gained in discussing theory and practice beyond the average mechanic's capabilities and interests also gives the officer a wider knowledge of the subject. This enables the motor officer to understand the "big picture" much better than his mechanics. For instance, the mechanics may or may not know how to tell a "hot" spark plug from a "cold" one, but there is nothing so good as driving the lesson home with a little talk on combustion and ignition—a talk which an officer can learn in a half an hour of classroom discussion, but which only the mechanic knows.

While the motor officers are kept together for the theory classes, decentralization starts with the practical course. On Wednesday afternoons the three battalion MTO's and I get into our coveralls and work on a truck covering what we have discussed in class the previous Monday. When we were discussing valve adjustment, for instance, we spent about two and a half hours arguing about the proper "feel" of the gage when the valves were adjusted correctly. We finally reached an agreement on how the gage should "feel" and now use that for a standard for the whole regiment. We had really gotten those valves adjusted to within a quarter of a thousandth of what the maintenance manual called for, but that wasn't the important point, most of our mechanics can do that; the important thing was that we were now interested and capable of inspecting something which a week before we had ignored and taken for granted. We were riding our hobby.

On Saturday afternoons each battalion Motor Transportation Officer has his battery Motor Transportation Officers meet at his motor pool and teaches the same practical work that he learned on Wednesday. Again there are arguments about the feel of the gage; again there is discussion and compromise and again interest is aroused in the new topic. The four battery motor officers who, only a week ago, had but a hazy idea of where the valves were, are now enthusiastically capable of inspecting valve adjustments.

On Monday afternoon each battery motor officer repeats the practical lesson with his mechanics. Sometimes the classes do not go off too smoothly, because the mechanics have their own ideas on many subjects and are quite sure that they're right. So at the Monday evening theory meeting, many complaints are aired starting, "My Sergeant says. . . ." These arguments are settled by reference to the manual and a new lesson begins.

Does the above method accomplish its mission? I think so. From a stepchild of "in addition to your other duties" automotive maintenance takes its rightful place beside

in the minds of the officers and men. Malpractices picked up by the mechanics by years of knocking around small civilian garages, careless assumptions which they have come to believe as truisms—"I didn't think it mattered about valve clearance so long as you couldn't hear the valves knocking"—and the "prima donna" feeling of the mechanic that no one can check or do his work—all these were brought to light and corrected.

Automotive maintenance is probably the only subject that isn't normally taught and supervised by a battery officer. Even a cook's kitchen and meals are carefully inspected by the officers, but the mechanics are left pretty much to themselves. They have many faults, but these are faults which only technical inspections can reveal. Most of them are not thoroughly familiar with their maintenance manuals; this is a cause of much of the poor adjustment and lack of essential lubrication that are revealed by inspectors. It is these faults in the mechanic which cause many a vehicle to break down and become useless while it is comparatively new. The inability of most mechanics to use their books correctly for reference leads them to hoard "trade secrets," learned at a good service school or that they may have picked up in conversation with another mechanic. I noticed in my Deadline Reports that we were replacing hydrovac cylinders on the GMC trucks at the rate of two a month for the fleet. These cylinders are part of the brake control system and shouldn't give much trouble. A physical inspection of the vehicles disclosed that the air cleaners of these hydrovacs were not being cleaned and that the lubrication was being neglected in most of the batteries. Questioning the three battalion Master Sergeants

disclosed that all of them knew the lubrication procedure quite well, while only one of them knew about the cleaning of air filters. But they had never passed the procedure of lubrication on to their own helper-mechanics, much less to their battery mechanics; they had never discovered the facts about air-cleaner cleansing. Yet, both of these processes are carefully described—and prescribed!—in the maintenance manual which is issued with every vehicle.

The battery motor officer who can read, understand, and interpret the manual to his mechanics will be trusted and respected by them. Soon they will be bringing their troubles and problems to him—and mechanics have many problems. For instance, we had trouble with watered gasoline in the 50-gallon drums which we drew from QM. I heard of vehicles breaking down on the roads. Investigation brought out many complaints about the gas situation. When I talked to the battery motor officer, however, I found that very few of them were cognizant of the problem; still fewer had been asked for solutions or help by their mechanics. But, while we were talking over the problem, various solutions kept jumping to the minds of the officers. "Why don't we shorten the pump pipe and so miss the bottom few gallons which will contain all the water?" "Why don't we pump out and throw away the bottom part of the barrel first? That contains all the water," etc. This problem, which had been dismissed by the mechanics as "bad gas," offered a challenge to the ingenuity of the officers whose greater familiarity with the laws of physics brought forth many answers. But these mechanics had not consulted their officers because the officers had not shown any interest in the problems of running a motor pool, nor did the me-



"It is a definite and necessary part . . . of maintenance to see that the vehicle is kept . . . decently clean."



Maintenance and repair in the field—New Guinea.

chanics have any confidence in their officers' ability to help them.

The officers' schools provide the training and spirit that enable them to lead their men again, even through the intricacies of modern machinery. We have other schools in addition to those outlined above. Being a regiment, we have three master sergeant mechanics who have many problems which exist only in their particular jobs. We have a school for them which is more a discussion group than an actual book study class. These men are responsible, under the battalion MTO, for making the six-thousand-mile vehicle inspection. This is a long and tedious job, but each of these men, who usually have a wide background of civilian experience to draw on, pick up short-cuts and make special devices which help to speed up the operation. Their meeting is a fine place for them to talk things over and pass on their various personal experience, meanwhile building up that spirit of competition and *esprit de corps* which makes men do their best.

Another all-important and necessarily continuous school is the drivers' school. Driving a military vehicle is far different from driving a civilian car or even a truck. Units which do not receive all their vehicles and take part in a maneuver before they leave the States will find that the majority of their drivers are hastily trained, with only a sketchy knowledge of the fine points of dragging a gun or trailer around. Even with all your drivers properly trained there is a problem of keeping them in practice. If you are in a position for three or four months the only men who will drive much will be your six or eight regular drivers in each battery, while all the others will be doing only their normal gun duties. Yet, when you pick up and move again, the safety and lives of the crew will depend on this man, who hasn't been behind a wheel for the last few months. Too, shifts often occur in the field. Often we say, "Let's shift Private Jones over into the third gun section and make him the assistant machine-gunner," without realizing that he will now also be a driver. Is he trained for this? I have seen too many vehicles lying wrecked at the side of the road to allow a hasty answer in the affirmative to pass unchallenged.

Another point of driver training which cannot be over-emphasized is training in the care of the vehicle. Shifting Jones, as in the example above, will not teach him to take care of his truck; only training at a school can do that.

The method of teaching the driving and care of the vehicle is again made a battery function. The battalion maintenance officer teaches the battery motor officers, and they in turn teach their drivers. Since the enforcing of proper driving methods and driver first-echelon maintenance is a major factor for battery discipline, the teaching and checking up on the subject should be a battery function. Poor driver training results in high accident rates and many needless vehicle breakdowns.

## II. THE INSPECTION PROGRAM

The need for constant and careful supervision of the Army Preventive Maintenance Program cannot be over-estimated. TM 9-2810 provides for the following maintenance inspections:

1. Driver's Daily check, consisting of Before Operations, During Operation, At Halt, and After Operations inspections and servicing.
2. Driver's Weekly check, consisting of more careful check and servicing of certain items.
3. 1,000-mile check, consisting of a technical servicing and inspection of the vehicle; it is done every thousand miles or every month, whichever ever comes first.
4. 6,000-mile check, consisting of more inclusive technical inspection, servicing and adjusting of the vehicle than was done in the 1,000-mile check; this is done every 6,000 miles or every six months, whichever ever comes first.

As regulations provide, even if the vehicle stands in the field for a month it must be inspected and serviced because of the rust and the drying up of the grease and the general deterioration which takes place. Recently we received a sudden order to shift one of our locator vans. This vehicle had not been properly taken care of in its isolated position and it broke its timing gears in the middle of a six-hundred-mile run. Towing this vehicle to its position and replacing the gears proved quite a chore. (At this point someone familiar with our echelon system of maintenance may be thinking, "They shouldn't replace timing gears; that's a third echelon job for the Ordnance." But like many other things out in the field, you must be prepared to make repairs beyond your normal capacity and, in this case, with the equipment needed in position, it was quite impossible to turn our truck in to be fixed at a shop.) At another time one of our prime movers towing a 90mm gun came to a very sudden stop and couldn't proceed with the convoy. Investigation showed that the jack-shaft bearing had burned out. Both of these cases were instances of lack of preventive maintenance, and you can lay nine out of ten vehicle failures—or more—to that.

Let's examine the time factors involved in making these inspections. Are your drivers in the habit of dashing into the motor pool every morning, jumping into their vehicles and rushing off to their details? Do they drive in at night, shut off their motors and dash for the mess line? If they are they're not doing their inspections. It won't make any difference to you now, if you've got a Regimental or Battalion garage and only half of your transportation and all your

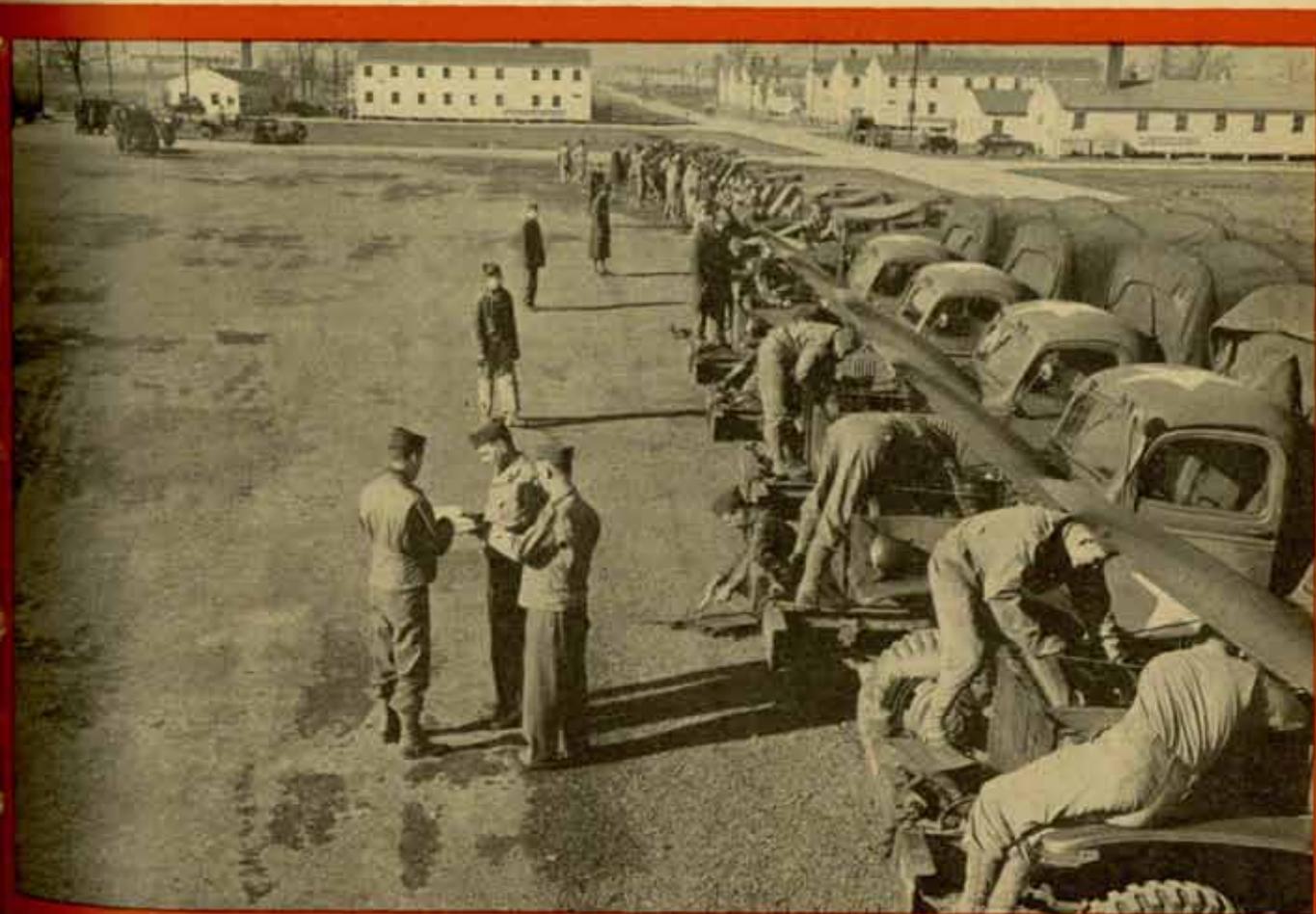
vehicles are new, but wait till your trucks are six month old and you've got all of them and your battery is a hundred miles from the nearest motor pool and your vehicles start breaking down! If your drivers aren't trained, now is the time to train them. How about these monthly checks? Suppose your T/E calls for twenty-five vehicles; that means you've got to make about one monthly check a day in order to get all of them done this month. Do your mechanics know this, or do they, like ours did, simply fiddle around with whichever truck breaks down first? No matter how good your motor sergeant is, I think you'll agree that this is the point for officer supervision to begin. Planning these inspections and making sure they are carried out is a really big job.

Even if you've planned the inspections, that's only half the job. No matter how conscientious your motor sergeant is, he is always tempted to slide over certain difficult or tedious operations which he may regard as unnecessary. Cleaning the ball and socket joint at the base of the gear shift lever seems unnecessary at first glance, yet in a few months of driving in dusty country it may cause your transmission to jump out of gear. Your sergeant may have picked up some erroneous information about a "better setting" for distributor point spacing or valve setting. This may cause other damage to the motor. It takes constant checking on the part of an officer to keep these men on the straight and narrow path of the maintenance bibles. The Army re-

quires that a work sheet be kept on each vehicle (WD AGO Form No. 461) so that the inspections will include a standard number of items to be inspected. This sounds like a fool proof method of keeping the mechanics on the ball, but I've picked up one of these sheets for an ordinary 2½-ton cargo truck only to find such mad things checked off as "Track Tension" and "Diesel Fuel Injector Pump" and "Armor Plate"! This shows that the mechanic has checked those items which he thought proper and then filled in the sheet with a series of check marks, not even bothering to look at what the thing said.

Many times special mechanisms or processes can be developed which will speed up the work and save labor. For instance, on the 6,000 mile inspection it is necessary to remove the wheels and pack the bearings with grease. All too often three or four mechanics will sit around while one wheel at a time is jacked up, removed, greased, and replaced. It takes very little ingenuity to provide four or six blocks and to hoist first one end then the other, shoving the blocks under the axles and thus allowing the men to work on all of the wheels simultaneously. This sounds very simple, but it usually takes an officer with some interest in the matter to cause the adoption of such a scheme.

Another aspect of a proper maintenance program is the care of the motor pool. Whether it is a modern garage requisitioned from civilian owners or a shady plot of ground in a forest, a motor pool must have certain fundamental



An occasional full dress inspection by the C.O. himself often does wonders.

features which, if allowed to run together, bring chaos instead of order. Because the vehicles are so unwieldy there must be a properly considered location of the fuel barrels with relation to the entrance; the grease rack or pit must not be in an awkward position; the oil and grease must be carefully stored so that careless or tired drivers and mechanics will not be tempted to make costly mistakes by using the wrong lubricants. The second echelon tool set must be handy and well kept; tools have a bad habit of disappearing.

Efforts must also be made to keep the vehicles clean. It is a definite and necessary part of the driver's and mechanic's maintenance to see that the vehicle is kept painted and decently clean. This is not only for appearance and morale, but also for very definite technical reasons. The bugaboo of rust exists just as much on the truck as on the gun; in addition mud- or dirt-clogged vents will cause broken oil seals, mud-coated oil pans and radiators act as insulators and do not allow proper cooling for the engine, mud-caked springs do not allow broken leaves to be detected, dirt-coated grease fittings which are hard to find present a great temptation to be skipped during greasing.

Besides the purely technical aspect of the inspection program as outlined above, there is a definite necessity for "inspecting the inspections." Your battery mechanics inspect your distributor spark gap and make a check-mark on the Inspection Form, meaning "O.K." Now the battery motor officer cannot follow each mechanic and check him and, while he can, by a system of selective sampling, spot-check the work of his men, this is a tough way to do things. For an officer to put on a pair of overalls, take up the mechanic's tools and sheets and deliberately check on his mechanic's probity, will ruin the necessary spirit of cooperation and mutual trust. As I see it, the inspecting function of the motor officer is limited to checking the paper work, which involves complicated planning, and dropping into the motor pool to see that all is running smoothly and that the mechanics are not killing too much time by embarking on big repair jobs that belong in a higher echelon maintenance shop. Of course, the Saturday morning inspection to check on the orderliness and cleanliness of the pool is necessary also.

The function of "inspecting the inspections" is a higher echelon job. It's up to the Battalion Motor Transportation Officer to inspect all the motor pools under his Commanding Officer's command, to see that the required inspections are properly performed. To make still more of a game of it, battery inspection teams can inspect other batteries on a round robin system of inspections. This is a particularly nice way of making the corrections and at the same time raising a fine competitive spirit which will do more to keep your mechanics and drivers working toward perfection than all the lectures and scoldings in the world. Of course, this sort of competition needs publicity and at this point I must describe my weekly *Automotive Bulletin*.

When I was an S-3 in an AW Battalion stationed in Boston, I found that the men at the isolated gun positions were in the doldrums of apathy. In an effort to rouse them, I started a series of written gunner's examinations and read off the results at a battery commanders' meeting. One battery commander said, "Why don't you publish that in

some sort of bulletin?" I answered, "You fellows are groaning now about the amount of poop coming out of the headquarters," and he returned, "Yes, but that's only dressed to us. Write something up for the men—they're desperate for something to do that they even read the fine print on the food box labels!"

I checked up on this and found that the men, cooped up in their positions for 24 hours a day, every day, were reduced to the point where they were even reading their training manuals at night! That started me on a system of assigning a lesson each week, giving a test and a gun drill to one section of each battery and publishing the results in a mimeographed one-page *Training Bulletin* under such appetizing titles as "Standing of the Batteries," "Does Your Gun Crew Make These Mistakes?" and "Boner of the Week." This was the only piece of "poop" I have ever turned out that was so eagerly welcomed.

Naturally when I was assigned to my present job I thought of turning out such a bulletin, and when I finally did, the *Automotive Bulletin* was almost as well received by the drivers and mechanics to whom it was addressed as the *Training Bulletin* had been in Boston. Of course such results can be published in the daily bulletin but, for a medium of publicity and a clarion call for "More Preventive Maintenance" or "Our Accident Rate Must Be Reduced" or "Are These Things Wrong with Your Trucks?" nothing can replace a little bulletin addressed right to the men. Americans are great readers and have a healthy respect for publicity; you can just see a motor sergeant's face fume when he finds that the Regimental Inspection Team (publicized as the terrible two) has found his motor pool POC on the basis of spot-checking two of his trucks. Excuses and complaints are duly registered, resulting, in a few cases, in the Battalion Commander coming up to demand a spot check! But, on the other hand, when the news is published that the First Battalion has not had an accident in three months, the drivers become proud—and doubly determined to keep their first place.

The first function of the bulletin is to publish the results of these spot-checks and the organization of the spot-check teams must be such that they can perform their function without taking too much of the time of the battery or battalion mechanics. It was found that an officer is an absolute necessity on these teams to keep the Sergeants from playing ball with each other or, in the other extreme, finding faults where none exist. The inspections should be made in a spirit of good-natured determination to find a fault if it exists.

Our Regimental Team consists of a specially qualified Lieutenant and a motor sergeant detailed for the purpose. They use a check sheet compiled from the 1,000 and 6,000 mile check sheet. It takes about an hour and a half for these two (the Terrible Two of my bulletin) to check a vehicle. It's a thorough job and reveals slipshod work or ignorance on the part of the mechanics.

The battalions and batteries use a simplified check sheet which checks the first and second echelon maintenance. This only takes about fifteen minutes on each vehicle inspected. Approximately one-fifth of the vehicles in each battery are considered a fair sample. In a separate battalion

organization it would be up to the battalion check team to make the more technical check.

Outside inspecting teams are also a fine tonic for a combat outfit. Most base section Ordnance Units contain an inspecting team which is only too glad to be invited to inspect an outfit. When the results of their inspections are published—well, heaven help the poor sergeant whose pool fails to measure up!

These inspections are in addition to the normal command inspections which are required by regulations. An inspection by the "Old Man" will do wonders for the appearance of a motor pool which may have been neglected in the intense concentration on the vehicle.

### III. ECONOMY PROGRAMS

When we enter a theater of operations many of us tend to scoff at economy. "This is war!" is the excuse for much waste and resulting inefficiency. Well, you'll be less prone to scoff when you've been blithely turning in tires with broken casings every week and Ordnance says finally, "There are no replacements for this size tire in this theater." Or when you are suddenly told, "No gas closer than fifty miles away—tanker sunk and our stocks are depleted two weeks sooner than we figured." Or when an accident wrecks one of your vehicles and Ordnance tells you, "None of these seven-and-a-half tonners available. You'll have to use an old reconditioned four-tonner till another shipment arrives—whenever that is!" Or when you find that all the mechanic's hammers that were in your vehicle kits were used to build tents back at your last position ". . . and they that have been left there or something!"—an explanation which is least comforting when you're ten miles from anywhere and need a hammer to put in a new winch shear pin to pull yourself out of the mud!

Yes, economy programs are necessary in a combat zone.

Before our regiment adopted a strong maintenance program, one of our searchlight batteries was turning in about three 2½-ton truck tires every week. The excuse—and these excuses are always good and logical—was that ". . . we have very rocky dirt roads leading to many of our sections—besides these tires don't stand up anyway!" Our other searchlight battery which had approximately the same type of roads and certainly the same same kind of tires, were not turning in one-tenth of the tires of the first battery. Well, the sergeant and I, armed with master tire pressure gages, descended suddenly on the uneconomical motor pool and checked every tire on every 2½-ton truck we found there. They averaged 40 pounds where the regulations called for 70 pounds, and the mystery was solved. Steps were taken to insure that each truck would be checked every morning and their tires no longer ". . . don't stand up anyway!"

Most waste is as easy to stop as that. Tools are a more difficult problem, but a Saturday morning check and a "Statement of Charges" for any lost tools will help greatly. To help the driver, the tools should be marked by stamping or etching (by a hot electric pencil) the battery check number on each piece.

Another great source of waste is turning parts in for salvage which can readily be repaired by the battalion mechanics. We've stopped that by making the batteries draw

and turn in parts through the battalion only. It does sound as if this procedure might slow things up, but actually over fifty per cent of the articles turned in can be repaired by the battalions faster than it can be drawn from a greatly harried Ordnance Depot. Also, when it is necessary to have the part replaced, the Battalion Motor Transportation Officer, being vitally interested in keeping his "deadlines" down and having the proper personal contacts, can get the parts more quickly than the battery motor sergeants.

At this point it may be well to explain this morbid interest in "deadlined" vehicles. These are vehicles which will not run or are unsafe to run. Before we started this carefully planned maintenance program, we received a rather sharp lesson. We had been in a stationary position defending a city for some months and as usual when a mobile outfit is static, we had plenty of transportation and tended to relax our campaign against deadlines. We suddenly received orders at five PM one day to detach four batteries for a long trip by 5 AM next morning. Imagine my embarrassment when I checked my charts and found that there were six deadlined vehicles among those four batteries! We couldn't very well replace these useless vehicles by trucks from other units because it might be only a matter of hours before the rest of us got our orders. No, we were in for it. We called Ordnance, whom we have always found to have a very realistic and coöperative attitude toward sudden movement orders, and they made the parts available within an hour. It was a rough night on the mechanics, but the outfits moved out with all their vehicles that night. This taught us a lesson, however, and was the spark which set off our intensive maintenance program.

Accident prevention is a very large and never ending part of the economy program. In foreign lands where people are not used to much traffic and drivers scoot along with Latin confidence in their tooting horns, the accident rate will rise to enormous figures if not carefully controlled. Driver training and discipline is a big part of the answer, but limiting transportation was found to be the surest means of reducing accidents.

My experience in Boston with a semi-mobile outfit had impressed me with what can be done with a small amount of transportation when the battery commanders coöperate. We have reduced transportation to the minimum compatible with carrying out our tactical mission. This has been roughly as six vehicles for a gun battery, eight for an AW Battery, and eighteen for a searchlight battery. With this limitation we have cut our accident rate from a high of three accidents a week to about four accidents per month. This also helped our economy program on gasoline and eased our maintenance program. With most of the vehicles immobilized, the maintenance problem becomes simplified and a rotation of the vehicles being used ties right in with the 1,000 mile inspection program.

### IV. CONCLUSION

Discipline can make a civilian into a soldier but only an interest in mechanical things can make that soldier into a mechanic. The program outlined above is an effort to arouse this interest by schools, to keep it aroused by inspections, and tie it into an efficient military effort by guiding it along the economy lines laid down by the War Department.

GENERAL HERRON was the first Executive of the first Personnel Division that the Army General Staff ever had. From the time he became Executive in this Division his interest in efficiency reports has been deep and abiding. General Herron and I have discussed this question many times, both by letter and by word of mouth. During the year and a half of the development of his plan we have discussed it at length and I believe it will work. I am also familiar with the weaknesses of the present system, having handled thousands of efficiency reports during my time in the War Department and as a corps, army, and department commander. All too often, after laboriously seeking in these reports the truth in regard to some particular officer, I have emerged with but a dim, uncertain and unsatisfactory picture.

I know of the near failure of our system not only at the beginning of this war but at the end of the last one when we tried to pick the best qualified men for our Regular Army, from lame and defective records. Soon we will again be trying to select not only new Regulars, but also those who are to have advanced rank in a greatly enlarged Regular Army. Let us hope that when the time arrives there will be a record that will show the true relative merits of the officers involved. The future of our Army, if not of our country, depends on this. I have no reason to believe that if the task were to begin tomorrow this war's records would be any more adequate than were those of the last.

So I join with General Herron in the hope that this presentation will help to evoke a better system than the one we now have and that the responsible authorities will recognize and put such a system into effect with a speed commensurate with the acuteness of the emergency. The existing system is a broken reed beyond repair or patching. It must be replaced!

MALIN CRAIG,  
General, U. S. Army.

# EFFICIENCY REPORTS

By  
Major General C. D. Herron

The supreme duty of a War Department is the defense of a Nation. This it can do only through an efficient Army with a corps of efficient officers. In fact, there is nothing as an efficient Army without a corps of efficient officers. Hence the necessity of knowledge by that Department as to the efficiency of its officers.

The acid test of an officer's efficiency and his usefulness to his country is the quality of his work. Obviously, knowledge of the quality of work done by officers of an Army as large as ours, the War Department must depend upon the reports of those who observe that work, when it is done. It is therefore not only requisite to have reports on performance of duty, but to have reports that are true to the officer, fair to the War Department, and illuminating to all who refer to them. The nature of the report system is of high importance to both parties.

Since only the angels can assign absolute values to performances of duty, mortal ratings must be relative and comparative. The rating officer must compare the job done with similar work done within his ken and by this means arrive at the rating of the workman. It is not beyond the power of competent officers to say which of jobs done under their observation is best, which is worst, and which is in between. This much a rating officer can do, although absolute values, numerical or otherwise, are beyond his powers. If upon such a seemingly scanty foundation a rating system can be built that will fulfill the requirements above stated, it will be on a foundation nevertheless.

The majority of competent and experienced observers within the War Department are agreed that it collects in the guise of efficiency reports much data that no one needs. Yet what it most needs it does not get. This is: Who are the most efficient at every grade, who least so, and who are the most efficient at all? It must know the best, that in war it may make them leaders of leaders. It must know this in peacetime that the coming leader may be trained for what lies before him.

The special training of the most promising cannot begin too early. The genius of Marshall, MacArthur, and Eisenhower was known to their associates when they were still lieutenants and might then have been known to the War Department, but instead was years in percolating.

At the other end of the scale, the War Department must know in every grade who are its worst, that they may be liquidated. The Devil is abroad in the world and an Army too soft to jettison its weaklings is on the way out!

Upon the great middle class of officers who beat no records and create no problems but who, in season and out, do their work well, some reports are of course necessary, but not many. If they are in good health and are suitably assigned, their sense of duty, aided by hope of preferment or fear of elimination insures adequate performance. Their adequacy is established by their presence in the middle class and on the efficiency reports of such officers it should be possible to economize.

For an "efficient efficiency reporting system," the requirements are reports upon individuals that are fair and illuminating and that, combined, clearly point out the best and the worst in every grade.

Does our system fulfill these requirements? The answer is a flat "No!"

When the emergency came on in 1940, the War Department needed for initiating the mobilization 150 general officers of ground troops. But efficiency reports, instead of showing the 150 best, showed only that of 4,000 ground officers of suitable general officer age, 2,000 were superior and best. As such a showing was perfectly worthless for the purpose, the selecting authorities reluctantly fell back on personal knowledge, which is exactly what the army thought it was getting away from when twenty years ago it inaugurated the existing system.

In the lower grades, General Staff committees charged with selecting from the records the best officers for promotion, found that ninety-five per cent of all officers were in the upper two of the five possible ratings. About all that seemed reasonably certain about them was that they were better than the other five per cent. Without the blink of an eye the records also declared that three-quarters of the field officers were in the upper third and to this absurdity the War Department calmly assented!

About all the committees could do in these circumstances was to fall back on hair-splitting and the totaling of arithmetical values arbitrarily assigned to the various ratings—a clerical procedure fantastically unworthy of the name of selection. But the records were to blame—not the committees.

At the other end of the scale, only one poor unfortunate was shown by his report to be of unsatisfactory efficiency. Yet the chiefs of branches when called upon, named some 200 whom they believed unfit for war. Subsequent impartial investigation largely confirmed their opinions and effectually stigmatized the system that had wrongfully labeled so many weaklings as fit for war.

The foregoing could be considerably amplified, but it seems unnecessary to go further to show that when the test came the existing system not only miserably failed to meet the hopes of its sponsors, but that it worked actual injustice, both to the Army and to the individual. The method clearly does not tell who are our best and who are our worst, although every commander worth his salt knows this in regard to his own command. In practice, and for reasons which need not here be discussed, this information is rarely passed on in efficiency reports. The general rule is: "All are best and none are worst!"

But such information as to the best and worst is the very bone and substance of any efficient rating system. Our system does not give it. It merely shelters the unfit and emits

a smoke screen to hinder the search not only for the worst but for the leaders of leaders whom we need so badly to find.

If the existing system is as bad as here characterized, what then?

As a proposal, the following outline of a form for reports and of necessary procedure is submitted:

(1) Name of officer reported on, rank, duty, station, period covered, etc.

(2) Date of birth.

(3) Rating (upper, middle or lower bracket). (See 7.)

(4) Reasons for rating. (To be stated for upper or lower bracket only.)

(5) Brief description, to include mental, physical and emotional characteristics, personality and specialties.

(6) Advantages or disadvantages of rated officer as compared with his competitors. (For instance: length of service, experience, difficulty of the task, etc.)

(7) If applicable, a full statement of the information available on the officer with the further statement that it is insufficient to warrant his inclusion in any comparison.

(Note: This will afford a needed refuge for weak or reluctant rating officers and so avoid one of the weaknesses of the existing system. The reliability of the reports will be increased. It will also protect officers newly arrived on strange jobs.)

(8) Signature, etc., of rating officer.

(9) Statement of the reviewing officer that he has checked through personal knowledge, official reports, or special investigations, the reports on the upper and lower brackets and believes them to be intelligent and fair.

(10) Directions for the use of the form.

Generally, the proposed procedure is to allot to each commander a fixed proportion of top and bottom ratings and compel him to the disagreeable and long-evaded duty of telling who are his best and who are his worst. The compulsion is the possibility of having it written on his own efficiency report that he does not know his command.

If it can be shown that the manifest disadvantages of a quota system will cancel themselves out and that from the mass of reports by subordinate commanders true gradations of officers from the best to the worst will appear, the system may be practical.

The exact proposal is that the lowest commander having under him at least five officers performing comparable duty, regardless of their rank or branch, report the twenty per cent best fitted and the twenty per cent least fitted for promotion, and report on the other sixty per cent, that they have been considered. The high and low ratings to be thoroughly checked by the next higher commander. The brief description to be as recommended in (5).

For example, in combat battalions where reports by company officers on each other are now notoriously weak, junior officers of companies having less than five lieutenants would be reported upon by battalion commanders in consultation with the company commanders concerned. If the battalion had as many as five company commanders or captain staff officers, the battalion commander would report upon them; otherwise this would be done by the regimental commander in consultation with those battalions commanders whose company commanders and staff captains are in-

volved. The middle sixty per cent would be reported as "Efficient."

After a commander has made his report, the next higher commander will check in every practicable way the selections of the best and worst and then forward all reports direct to the War Department, as other and intervening commanders can add nothing to them.

In a little while, and in the War Department records, two additional classes will develop. The two will consist of officers who are border-line cases, oscillating between two of the primary classifications. We will therefore ultimately have as now, five classes of officers, but the distinctions between them will be natural, meaningful and understandable, which is not now the case. There will furthermore be the same proportion of top second lieutenants as of colonels. However, it must be recognized that the struggle by those of the lower ratings to obscure distinctions among officers will still go on. Ceaseless efforts will be made to re-create the present situation in which everyone masquerades in a rating higher than he deserves, excepting only Class One officers who have no upward place to go. "When a wise man comes into the world, all the fools combine against him!"

It will be objected that such a system will result in twenty per cent being rated top and twenty per cent bottom—far too large a proportion. This will be true only for the first rating. In a short time, ninety per cent of all officers will have drawn either a top or a bottom rating and a little later those who are to be consistently top or bottom will begin to appear. A good officer will no more be stigmatized by one or two low ratings than he was by the same number

of "Unsatisfactory" ratings on his problems at Leavenworth. But like those "U's" enough of them will be serious for any officer. The make-up of the group to which an individual officer belongs, as well as his rating officer, will be constantly shifting, especially so in war; but individuals will soon find their levels, then to be but rarely out of them.

It may even come to pass that, as at Leavenworth, where no one contests the superiority of the officer who at the end of the period has received a top rating from practically every instructor and in almost every subject, the Army will not contest its own ratings, established by like methods. It might even further come about that the ex-officer who in every subject always drew the low rating, would agree that he did not belong, but that would be a good deal to hope for.

If our Army and our Nation are to survive in this savage world, officers must stand or fall on their Performance of Duty. Their value to the service is the sum total of their Performances of Duty. But for assignments of particular officers the War Department must know, not only their competency, but what manner of men they are. A few "Brief Descriptions" by different officers, provided they cover mental, physical, and emotional characteristics, personality and specialties, will tell the story. This, with "Performance of Duty" will give all that is necessary for assignment, promotion and even separation from the Service.

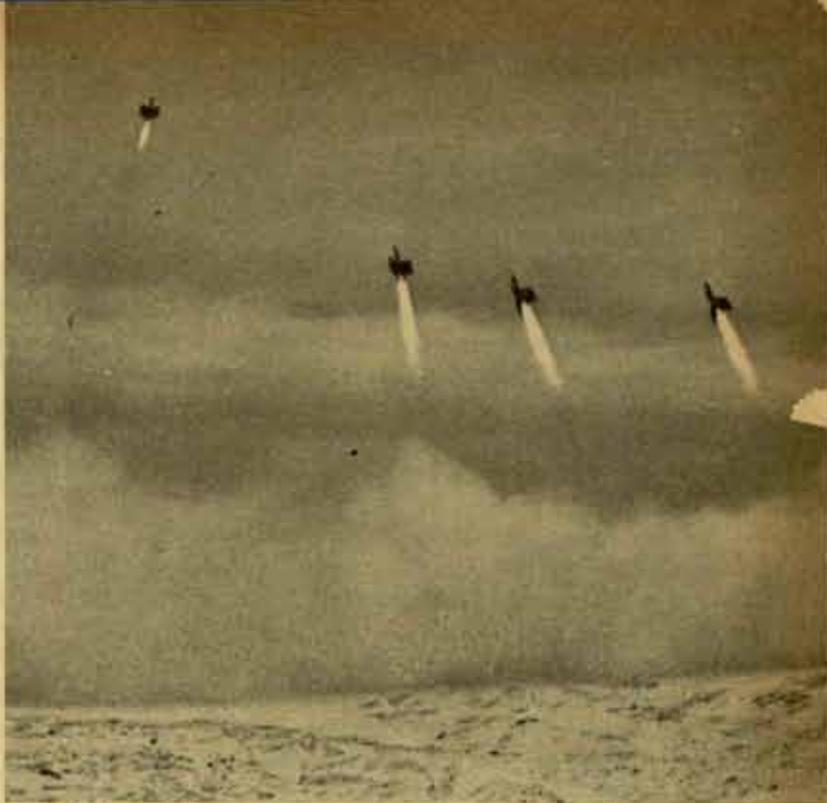
In the end, the proposed system will show for each grade the best, the near-best, the fully competent, the mediocre and the least competent. The "Brief Descriptions" will clearly indicate those wholly unsatisfactory and beyond the pale. If the system seems too easy and too simple, that is a misfortune.



The Cassino battle area. Mt. Trocchio (center) and Mt. Cairo, high peak in the background. The Abbey of Monte Cassino the white building above the town.

# ROCKET TARGETS for AA

One of the reasons for the excellence of American AA automatic weapons units is the rocket target. When gunners are able to get hits on these 450-mile-an-hour speedsters that are only fifty-nine inches long, Axis dive-bombers and hedgehoppers seem easy targets.



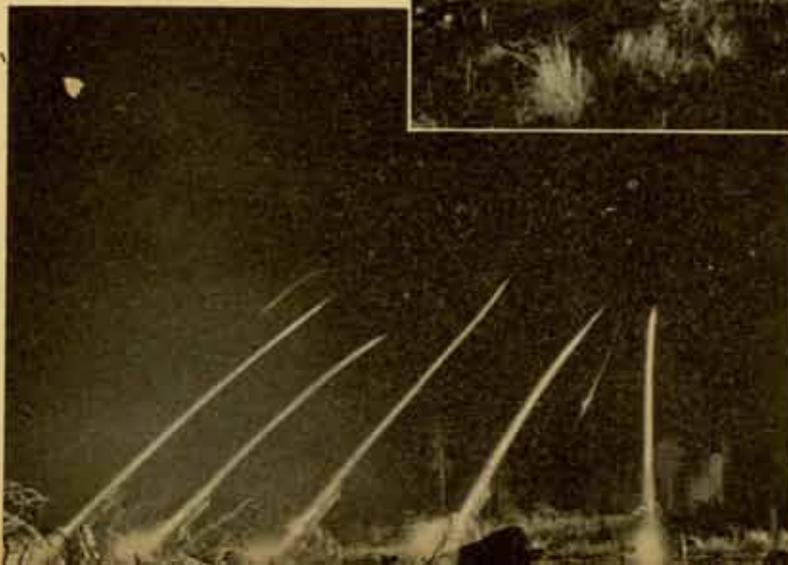
↑ Four rockets on the way. A cloud of dust covers the launchers.



↑ Loading the rocket in the launcher. Only one fin fits inside the rail.



↑ The targets work just as well at night.



← AW gunners have already begun to fire at the swift targets.

# An AA Battalion in SWPA

By Lieutenant Colonel A. Lester Henderson, Coast Artillery Corps

Our antiaircraft battalion was a former National Guard unit with almost two hundred years of history behind it. As antiaircraft artillerymen, it seemed inevitable that this organization, rich in tradition, should be one of the first to be called upon for combat service overseas.

In February 1942 we sailed for the Southwest Pacific Area as a part of the first American task force. Because the enemy submarine warfare was at its peak at this time, it was necessary to take special steps to safeguard the liner during the long voyage. Many guns were manned by the antiaircraftmen during the journey. The fast ship traveled thousands of miles in circuitous routes to guarantee its safe arrival. After a somewhat hazardous but extremely interesting trip the task force landed at a port in Australia with no ill effects, other than those to morale on the "home front" caused by a report released by short wave radio from stations in Italy and Japan announcing the torpedoing of our ship in the South Atlantic.

Our group seemed especially fitted for their rôle as far as being acclimated to the tropics was concerned. We were immediately moved up to the northern section of Australia with our tropical uniforms and equipment to await orders. During the train trip north we were applauded, entertained and treated royally by the citizenry as we stopped for meals and short periods of relaxation. The enthusiasm and genuine welcome were reward enough for these Americans who had traveled nearly 20,000 miles to assist the Australians to protect their homeland from the Japanese hordes, which apparently could not be checked.

The original assignment in the Netherlands East Indies was changed because the Japanese had captured the islands while the task force was en route. The battalion was ordered to set up antiaircraft defense of two important airdromes in Northeast Australia. This was during the last week of March 1942 and the first few weeks of April. At this time the only spot in the Southwest Pacific Area between Japan and Australia that had not fallen into the hands of the Japanese war machine was Port Moresby, New Guinea, just 400 miles from the Australian mainland. All of New Britain and the northern coast of New Guinea was infested with Japs and authentic information reported a huge Japanese invasion force forming in the vicinity of Rabaul, New Britain, the strong Japanese air and sea base, for a thrust towards Australia.

It was decided that at least some attempt should be made to hold the small Allied base at Port Moresby by reinforcing the force which was on duty there. We were given the assignment. We realized the seriousness of the situation and the absolute need for speed because the Japanese armada was already on the move south with Port Moresby or North Australia the destination. We strained every effort in a race against time, and by noon on the second day the small task force was on its way in a Dutch ship. We manned the few ship's guns and in addition set up our own

AA guns on every available inch of space. We were escorted by an Australian corvette on the journey.

The trip from Australia to New Guinea was made without serious mishap. On the last day of April the battalion arrived at Port Moresby and was met by the small group of officers who had been sent ahead by plane to make reconnaissance and preliminary arrangements for unloading and setting up gun positions. The Americans were warmly greeted by the Aussie force. Our small group, with an overstrength of AA machine guns and every man armed with an M1 Rifle, and often B.A.R.'s, pistols and hunting knives, was a considerable addition to the strength of the defenders. Each man had qualified on the small arms ranges and each was adept with the bayonet. All realized the task entrusted to them. The Americans were advised by the Aussies that they could expect a "strike" by the Nips at about 8:15 the following morning according to schedule. With this as an incentive, the ship was docked and by sunrise down the task of unloading the great store of equipment and supplies was under way. We assisted the Australian dock-working crews by manning the ship's winches, driving trucks and unloading the equipment while other details prepared gun positions, temporary kitchens, bivouac areas, established ammunition and supply dumps, laid communication lines and performed all of the many details necessary to be ready to greet the Japs at daylight if they should decide to change schedule and attack a few hours sooner.

After a busy night during which officers and enlisted men worked together as a well-coached team, the battalion was ready with a well-organized antiaircraft defense of the airdromes and vital installations. True to the Aussies' predictions, at 8:15 a.m. sharp the Nips came over with twelve-plane, twin-engined, high-level bombing attack. They were escorted by nine Zero fighters and came over at 26,000 feet. They dropped about 200 bombs, most antipersonnel ("daisy cutters") mixed with some demolition bombs. The target was a large drome and installation defended by Batteries A and C, but the aim was very poor.



Loading a 40mm AA gun on a C 47 for the trip over the mountains.



A 40mm position at Kila Drome, near Port Moresby.

damage was almost nil, with no casualties. The battalion had received its first air-raid.

We were all surprised to find how little we were affected by the raid. It was over in a few minutes. Huge craters were scattered over a large area in a single, regular pattern, the closest to any gun position being about one-hundred yards. The antiaircraftmen who were not on guns were digging out of slit trenches, brushing off, and resuming the work of building camp while others finished unloading the ship so that she could get away from the island as soon as possible. The gun crews continued to man their automatic weapons, their one hope that the Nips would come down within range of their guns as had been their custom for the past several weeks. Early that night the Japanese over Radio Tokyo informed the Americans that they were aware of their presence in New Guinea and urged them to evacuate the island at once before the Japs attacked and chased them off, or they would suffer the fate of the defenders of Bataan and Corregidor.

After another high-level attack by a formation of heavy bombers, we were given our chance. A group of six Zeros flying in pairs made a strafing attack on one drome while others attacked a smaller drome. The Japs came in at the top level, guns blazing, motors wide open, and attacked everything in sight. They were met by plenty of lead from a number of .50 caliber AA guns. When the attack was over, two Zeros were down and three more left with heavy, black smoke trailing from their fuselages which was almost a guarantee that they would not make the 175 mile trip to the high Owen Stanley Range back to their base at

the days that followed, the Nips tried other strafing attacks on other dromes and installations but received the same hot greeting by other units of the battalion. After several more unsuccessful attacks, during which they lost several planes and several probables, the Japs went upstairs. After, except for two occasions when they followed returning bombers in, they remained above 24,000 feet. In May the Artillerymen fought off thirty-four raids without the loss of a man but suffered some damage to equipment and supplies. During this period the battalion manned additional guns, unloaded ships, set up the Army

Post Office, buried the dead of the entire area, set up many miles of communications for the units of the island, furnished officers and men to work with the Australians in setting up the first operations room to handle the Aircraft Warning Service, and set up local defense of the dromes. In addition to these many duties, the Antiaircraftmen were called upon to perform other details that required every man to remain on duty twenty-four hours a day. But during this period and the months following, every man was ready and willing. Their enthusiasm and spirit was of the highest as long as they were seeing action, with the hope of seeing a Jap plane within their sights always uppermost in their minds and hearts. But by August first the heavy raids were becoming less regular, and all strafing attacks had ceased entirely, the chief attacks being nuisance raids by two or three float planes in high level night attacks.

During the first few months of duty in New Guinea several units of the battalion moved many times, some missions taking them many miles away. On June 23, 1942 one unit composed a part of a small task force which landed at Milne Bay and pioneered and built up that base. They were there during the landing made by the Japs in August 1942 and saw service during the entire Battle of Milne Bay, performing outstanding service and again proving most impressively what had already been learned: the incomparable value of the .50 caliber AA gun as a weapon against strafing planes and dive bombing attacks. In addition it is a very destructive arm against ground troops. This battery assisted in the defense of two dromes against ground troops at which time all fire was reserved until the Japanese troops had reached the "strip." Then the Americans opened up with their .50 caliber AA machine guns and piled them up at the edge of the drome. In this instance it was necessary to use a bulldozer to bury the Jap dead.

Later the same day, the Japanese airmen, believing one "strip" had been taken by their ground troops, attempted to land, and this maneuver gave the battalion its first field day. The net score was three Zeros and one dive bomber destroyed and two Zeros badly damaged.

This unit experienced great privations and almost unlivable conditions. They spent many hectic days and sleepless nights, existing only on bare necessities, in mud and ceaseless rains, combating disease, functioning at times with scarcely enough men to man the guns, and were finally relieved at Milne Bay (after the Japs had been annihilated at that point) and transferred to the Port Moresby area where they continued in combat service for many additional months.

In the early days of the battalion's service in New Guinea, we experienced the rigorous duties and attendant uncertainties of setting up formidable defenses along the beaches and ridges to withstand the contemplated invasion of the strong Jap forces. The first invasion was broken up and thrown back by the United States Navy in the Battle of the Coral Sea. The second attempt by the Japs was more successful and the enemy penetrated to within fourteen miles of the outposts of the battalion before the combined efforts of the Australian and American troops and the weather, terrain and jungle diseases finally checked them and started them on a hasty retreat over the Owen Stanley Range and through jungle trails, pursued by a very small

but determined Australian force. This was the real beginning of the Papuan Campaign.

During the entire service of the battalion in New Guinea, the "Trial and error" method for working out problems was used. The obvious fact that the organization, though considered a sacrifice unit, accomplished its mission within a very few weeks after it landed in New Guinea without the death of an officer or enlisted man proved that "the proof of the pudding is in the eating." It proved the merits of the operating procedure as well as the installations perfected and in use against unknown and diversified methods of warfare. The unit did, however, have a number of casualties who were later lost to the battalion from wounds and from disease and accidents.

While the total number of planes destroyed by the battalion was not very large, it was accomplished during a period of six or seven weeks and this period was those hectic, uncertain days immediately after the unit landed in New Guinea. Strafing and dive bombing attacks were broken up entirely, and it was very seldom that an enemy target ever came within range of the guns after that period. However, it was proved very definitely that the presence of the automatic weapons in the area deterred the Japs from returning to their customary method of low level attacks. Thus the mission entrusted to the battalion was accomplished. The total of thirty-three planes destroyed and an unknown number damaged was out of a total of twelve or thirteen enemy attacks. During the first year of combat service the battalion had experienced 114 air raids, four naval shellings and two ground attacks.

Many valuable lessons were learned in this theater, chief of which was the absolute necessity for training many specialists and having within the ranks an abundance of men of great versatility. Generators were built and vehicles and motors repaired from old damaged autos and planes; washing machines were constructed from gasoline drums, as were showers for bathing. A number of single and twin mounts for 20mm and .50 caliber machine guns were set up with armor plate shields. Ground and antiaircraft mounts were built for the .30 caliber machine guns. Various gadgets were devised and adapted to save manpower, such as changing the method of firing the Bofors and attaching containers for 40mm ammunition to facilitate loading. Various types of camouflage were constructed to meet different conditions. Ingenious disposal plants were constructed to dispose of garbage, trash and dish water to meet the disease menace. Latrines were fly-proofed and any kind of material that could be salvaged from bombed buildings was utilized to enable the units to function during the many months that it was impossible to ship supplies to the island.

Countless improvements were made to assist in combating tropical diseases. Malnutrition and vitamin deficiencies and stings and bites from jungle insects and rodents, stomach ulcers, dysentery and other ailments that at first incapacitated so many men, were soon "licked" and from a normal sick report of about 9½% it was finally reduced to less than 2% for all causes. Mosquito control, malaria discipline, the use of aspirin and B complex capsules, and every other possible safeguard to health was meticulously and scrupulously enforced to prevent loss of much needed manpower.

During quiet periods, recreation and relaxation were of paramount importance, but due to local conditions and lack of facilities, opportunities were very limited. Fishing, swimming in many streams, hunting to a limited degree, supervised motor trips to the rubber plantations and mines, the construction of an open air "movie," and concerts by a six-piece swing band organized within the battalion, were the only forms of recreation and entertainment for the personnel. The band, known as the "Rambling Rogues in Rhythm" were invaluable to the spirit and morale of the Defenders of Moresby. It traveled many miles over almost impassable roads and tracks touring the entire area to entertain Australians and Americans alike, often being interrupted by bombing raids, and returning at all hours of the night. This group received written commendations for their splendid services from general officers of the Southwest Pacific Area. The band, together with a piece of music written by a member of the battalion entitled *The Aussies and the Yanks are Here*, was very instrumental in cementing the warm spirit of friendship and wholehearted cooperation which existed between the Australians and Americans in New Guinea.

When conditions became more propitious, a comprehensive schedule of training of an entertaining as well as helpful nature was adopted including small arms firing, antimechanized firing, commando tactics, bazooka firing, the loading and unloading of planes and ships and barges with all tactical equipment including the Bofors and jeep, jiu-jitsu training, and other subjects considered essential to that Theater.

Necessity was the mother of many interesting experiments and changes and customs that were adopted by the battalion and the many valuable lessons learned have been passed on to higher headquarters. The impressive record made by the battalion which included the winning of a number of Soldier's Medals, Purple Hearts, Silver Stars and Letters of Commendation and a War Department Citation for the entire organization has been a subject for many a writer, correspondent and radio announcer.



Preventive Maintenance services are like suspenders—if you don't use them you're apt to be caught with your pants down.

# A Training Camp in Cornwall

By Lieutenant Harold R. Daniels, Coast Artillery Corps

EDITOR'S NOTE: This article is really two stories instead of one. But both articles are good, and to disentangle them would improve neither. Therefore, it is printed as it was written.

Somewhere in Cornwall is the living dream of many antiaircraft instructors. Listen well, oh ye who have waited out half a day for one hour's water clearance so that you could fire. The place is the 6th H M A A Training Camp, H M meaning "heavy mobile." Recently my unit received a two-week practice session there—we were the first American light ack ack unit to fire, the second American unit of any description to use the camp. Having been away from the States for almost two years the writer is not sure just what improvements have been made in our own practice camps. This I know, that they must be very good to match the facilities of this typical British camp.

In writing this I am confronted with three possibilities—I can discuss firing entirely, I can write about Major Hope, and I can write a eulogy on British-American relations. Each is a part of the whole, so here is a combination of the three.

The firing point is situated on a promontory about 450 feet sheer from the sea. The original roads into the firing point were much too narrow for our equipment so an advance party labored for a week widening them and preparing crushed stone emplacements. There is 180° field of fire and no boats are permitted in the area. You artillerymen who waited for hours for a fishing boat to move out of your field of fire would like that, I know. But this will make you wash your teeth. There are several squadrons of tow planes in the camp—they have no duties other than flying missions!

In addition there are classrooms available for wet days and an excellent aircraft-recognition room with a myriad of models and some first-rate instructors—British by the way. As a matter of fact, all the instructors are British—there is even a British Physical Training Instructor on hand to keep your men in trim. This is all part of a well thought-out plan, the idea being for our officers to devote as much time as possible to supervision and training in gunnery. And the British have been at the game for a long time.

Here is the firing schedule per gun section:

E1	E2	G1	G2	T1	ES1	GS1	GS2	TS1
10	20	20	20	40	20	20	20	40

The numbers on the bottom line are, of course, the number of rounds fired. The E refers to elementary, the G to gunnery and the T, tactical. In the second group, the neglected S refers to the Stiffkey Stick, about which, more

The idea, you may note, is to shoot. Every possible break in the rainy days was utilized. On more than one occasion our crews hot-footed it down to the firing point to get in one course before the rains came again.

The camp is commanded by Lieutenant Colonel Willis, a

tall, typical British Officer. The gunnery is under the supervision (close!) of Major Ian Hope, and a complement of officers and Sergeant-Major Instructors in gunnery, one of whom was assigned as a coach to each battery. From the beginning both British and Americans laid their cards on the table. To quote the boss, Lieutenant Colonel John Mazzei, "We are here to learn what they know. Let's learn it." Any tendency on the part of our troops to resent being taught and criticized by John Bull was dissipated immediately when we found out that he knew his stuff.

There were social adjustments to be made. One of the factors that had worried us a bit was the presence of Auxiliary Territorial Service girls who are used as recorders and observers. They are very pretty as a rule—even if they do wear long pants. And the thought of them standing behind the guns—well we needn't have worried. Once the shooting started they could have been statues for all the attention they received from the enlisted men. As for the officers: the funniest sight we saw during the whole stay at camp was that of our battery and platoon commanders begging and cajoling credit for line shots from the girls. Invariably the girls were adamant—and invariably the beseechers would stamp away muttering in their beards their opinion of women in the army in general.

There was the custom of tea in the afternoon. We came to like it very much. What we really appreciated though was the morning coffee which is also a British habit. We needed it—it was quite cold as a rule on the firing point. After two days of instruction we started shooting. Ours was an unusual case—the outfit had been in another theater as a 155mm battalion for more than a year. On arrival in England we were converted to the 40's. We had done no shooting—officers and men alike had spent their days—and most of their nights since then, mastering the elementaries. The first day we were quite bad. The drill in particular was sloppy. But the I.G.'s were right on the spot, making corrections after each course. And the improvement was noticeable immediately. By the end of the fourth day of shooting we were getting our full share of hits.

Procedure was as follows. The crew would count off as the target approached. Given "target" they would man their gun and engage. Single rounds were fired, usually ten to a course. After each course there would be a critique, where everyone was free to speak. At the end of the day the battery commanders would meet with the senior I.G., Major Hope, and receive their scores and plan the schedule for the following day in accordance with the needs of the battery. This flexible schedule was found to be a tremendous improvement over the old week-to-week plan. A word about the tow planes. Most of the pilots were either operational flyers getting a rest or new pilots getting practice. Censorship forbids my mentioning names. The planes themselves were study Hawker Henleys, once used as dive bombers. A clever windmill device reels the sleeve in when necessary. Speeds were usually about 150 m.p.h.

The Stiffkey stick received as much attention as the di-

rector—and the results using it compared very well with the M-5. Ideally, of course, the director is the most accurate method of fire. In the field, however, the British feel that a large amount of shooting will be done when there is no time to set up and orient a director. We considered it advisable to give priority to the training of the gunners as operator rather than the range setter, although it will be advantageous to have as many trained operators as the practice training permits.

Now this Major Hope fellow. Somehow, for all his limp—more about that later—he gets about like a rumor. His short figure and red hair are one of the most familiar sights in the camp. It took several sessions in the club with the best part of a meagre supply of Scotch to get him to open up about his adventures.

It was only when we told him that it was for the common good that he agreed to publication.

Major Ian Hope, "The Torch," also variously known at the club as "The Wild Irishman,"—actually he's Scottish—found himself at the start of the African Campaign in Alexandria, with a two-pounder antitank regiment. After only a bit of skirmishing action he was assigned to a Bofors ack ack unit and sent to Greece where the unit was attached to an armored brigade operating near the Jugoslavian border. Targets were plentiful and antiaircraft was scant. The guns were often split up into sections (two guns) and even operated as singles. "In this way," the Major commented dryly, "we found out the advantages of mutual support." But let's let the Major tell it. It's his story.

"It's a very bad thing to split up one's guns—but we had no choice. It was quite nasty at times. Jerry had the air—sometimes he'd have a dozen different types in it at once. Old biplanes would fly over and the pilots would throw grenades out. And of course we couldn't dig in—very mountainous there really. Quite rugged. Very often we actually fired at planes down hill. Since we couldn't dig in we'd spot our guns at the edge of a wood. When it got too rough we'd duck in under the trees. Most of the time it was very difficult getting our guns into any kind of a good site. I've often fired with one jack hanging in space over a cliff. Once I remember protecting a bridge—the only way we could get far enough away was to put the gun in the water. Fortunately it was shallow—it just came over the platform. Don't know what we should have done if we'd had predictor to worry about. But we were being chased out of Greece all this while.

"We helped form a rear guard at Thermopylae. That was the last action we fought as a unit. We raced South then to Corinth—but the paratroops beat us there by a day. We headed East toward Athens, and laid up in the woods. We'd destroyed our equipment of course. One unit had a radio—through it we contacted a destroyer. Meantime we heard of an antitank gun some miles away—it had been left intact. With eight men I went back and destroyed it. When we returned the destroyer had come and picked up our chaps and had left again. Of course we couldn't stay where we were. We headed North up the coast, traveling by night and lying up by day. We had a Bren gun with us—good job too. We were picked up by an armored car—quite slow it was. We fixed them—but it left only five of us. We came at last to a town—and our hearts were gladdened by the

sight of a pinnace in the harbor. Without waiting to see if there were any Jerries about we made a dash for it. The captain put out to sea at the point of a gun. We were a bit puzzled—we had no maps—but we needn't have worried—the boat blew up a few miles out.

"We made the nearest island in the small boat. It was deserted—all we found was two bottles of whiskey. That's what we drank. For the next five days we just waited, eating the last of our rations. There were no sails on the pinnace to be seen. Then one morning we heard a motor launch approaching. We hid unnecessarily, it turned out. Straight into the harbor it came, until it was near enough for us to see the two occupants wore the uniform of the Greek Navy. They had come, it seemed, from a Greek destroyer which had been run ashore at Piraeus. Their names were Stefanos and something unpronounceable. Him we called George. We still didn't know where we were—but I hoped to get from island to island and thus make Africa. The Greek had joined forces with us. Unfortunately we had no maps. One day just as we were running out of fuel we sighted a large island—from its shape I knew it to be Cyprus.

"We were welcomed and fed there—and when we had eaten we took a number of passengers. We had decided to head for neutral Turkey. In the dead of night we landed and were immediately interned. I was feeling rather low. I'd stopped a bullet with my foot in Greece and it was bothering me. We were well treated in Turkey, however, and soon I was fit and ready to go. With Georgie and Stefanos and two of our chaps I escaped in the same boat in which we had come. I knew Crete was west and there we headed. Soon we were lost entirely. The oil gave out and we made sail of a blanket. Luckily we found a small island. There were twelve men on it and they acted rather unfriendly. We caught one trying to use the local telegraph station and we threw them in jail and burned the telegraph station. (Here the Major sighed and wondered audibly what had happened to his prisoners.) There was very little food on the island and we decided to head on for Crete. We found a pocket Atlas in one of the houses and with that and the sun we knew at least in which direction to head. And then one day a destroyer raced up—one of ours. They were headed for Malta and asked us if we wanted to go. We decided that I'd still like to try to make Crete. They gave us some food and dashed away. Two days later we made Crete—and they were catching a packet. They threw me in jail—I had no papers of course. They were having air raids every half hour. By God's own grace I saw a chap I knew and he identified me to the commandant. I was released of course and I asked for something to do. They gave me a Lewis gun and a cottage at the edge of the airport to live in.

"We held it for ten days, shooting thousands of rounds at planes, gliders, and paratroops. A funny incident happened one day—a glider crashed right beside our little fortress—everyone was killed save one major. We fired at him and he dove into a well. Every now and then he'd stick his head up and shoot at us. One of our chaps got tired of it one day so he threw a tin of petrol into the well and fired into it. Out came the Major! He was wounded pretty badly, but we brought him in. It seemed he'd once been an ice box salesman in America! Very interesting chap. Later he died.

It was getting pretty nasty by this time. We were glad when one morning a sailor rushed up and told us that the land was being evacuated. And we were. Some of our destroyers sailed smack into a Jerry-held town! Our chaps fought their way aboard and we left Crete behind us. And while later we were in Egypt. Of course we didn't make it—the destroyer—bombs sunk her and we were picked up by H M S ——. I found that my battery had been lost. In Egypt we re-formed it and spent some time in Syria. It had been quite a show. We'd shot down some thirty planes and we'd had the ammunition it would have been a great deal more. Often, we'd fired single-shots at formations of 20 planes!

We went back into Libya for the second campaign—and were in at the relief of Tobruk. We were at Bengasi when the retreat started. Here I was hit again in the same spot. Made me quite browned off. Desert warfare? Pretty tough. Can't dig in—have to build up—but *do* it. No camouflage—used color painting. Worked quite well. *Care and maintenance is the whole show.* Gunners must be like the cavalry. Care for your gun first of all. I think we had

fourteen Stukas by that time. Then they sent me back to Staff School—and here I am."

I whistled. "Major," I said, "you've been around. I can't thank you enough. Before we finish though, is there anything you'd like to emphasize? Something I can pass along?"

He smiled. "Yes," he said. "Tell them this. Learn your Stiffkey stick. Your average engagement will be from five to six seconds and you won't be able to get on always with the director. You must keep your communications men keyed up. And above all you must give your gun commanders responsibility. They're the ones who must make the decisions. It's the best job in the army. You Americans are potentially the best in the world. Physically and mentally you are incomparable. All that's lacking is a little battle experience—and a little more serious attitude."

The fire had died down and the Scotch was gone. "Anything more, Sir?" I asked.

He grinned, "Yes—tell them this. *Dig in!*"

"Thank you very much, Sir—I'll pass it along to the rest of us."

And there it is.



We must learn to think that there is nothing essentially evil in force which is but another name for the power or energy necessary for doing work or achieving ends; that force is only an instrument which, if properly controlled and directed, can become the very cornerstone of justice and order; and that all law, all peace and order, internal or international, are empty words if they cannot be effectively enforced by the organized power of the community. We must remember these wise words uttered by the French philosopher Pascal almost three hundred years ago: "Justice without force is impotent. Force without justice is tyrannical. We must, therefore, combine justice with force."—HU SHIH, Chinese Ambassador to the United States.

THE

# Journal

NEWSREEL

Pictures from all the world

Signal Corps Photos



HAWAII: Barrage balloons protect a harbor area.

NORTH AFRICA: A well-camouflaged 40mm gun is ready for instant action. ↑



→ ALASKA: A 37mm crew sees something interesting near an air field.



KWAJALEIN ATOLL: The Seventh Division lands on Enebuji Island. "Alligators" on the beach.



↑ ITALY: What remains when a FW 190 is hit by AAA fire.



ITALY: A "90" crew stands by in a position that was chosen by necessity, rather than choice.



SOUTH PACIFIC AREA: The weather "laboratory" in operation. It isn't pretty, but it works.

AMCHITKA ISLAND: A "37" crew →



# Gun Commander's Action for 155mm Guns

By Lieutenant Colonel Wilmans K. Ballough, Coast Artillery Corps

The value of accurate fire control for Coast Artillery cannot be denied. However, experience shows that the accurate fire control system of a battery is frequently not ready to produce at the moment it is needed most. The reasons are numerous. B<sup>1</sup> can't pick up the target so we wait till he finally gets on, and then B<sup>1</sup> loses the target. Then they both report on target and everything is fine, or will be after the plotter decides the course is satisfactory and provided B<sup>1</sup> and B<sup>2</sup> are on the same target. In the meantime the enemy target being unaware of our difficulties or perhaps in a hurry will very probably keep moving and proceed with his mission without waiting for us. Then of course there are always communications to go out just when we need them.

It should be obvious that when gun crews have guns to

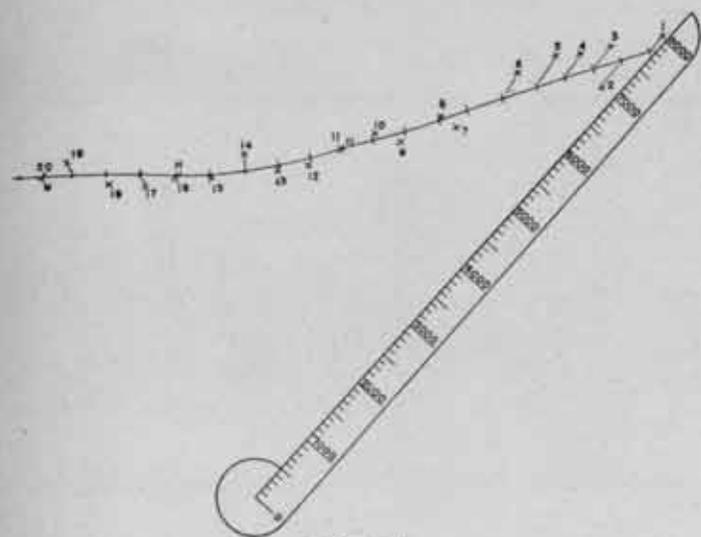


Figure 1

man, ammunition to fire and an enemy to be attacked, nothing should be allowed to delay or interfere with laying fire on the enemy.

One solution developed at one station is an effective method of training for and firing gun commander's action.

The gun commander estimates range and lateral components of target speed and opens fire. He does not attempt to make an accurate estimate of course and speed. Instead he develops range and its rate of change directly by bracketing, and adjusts deflection by splash jumping. Accurate spotting is of course essential to successful conduct of fire. The gun commander may delegate range adjustment and deflection estimation to appropriate members of the gun crew.

The first round is fired with estimated data and sensed for range. In order to bracket the target quickly the range is changed one thousand yards for each shot until an opposite sensing is obtained. When the thousand yard bracket

is obtained it is split to 500 yards. If possible the bracket is split with each successive round until hits are obtained. This procedure has to be modified because naval targets usually keep moving and the range changes rapidly. Therefore, it is desirable to get alternate overs and shorts while bracketing in order to keep squeezing in on the target. When two or more shots fall in the same sense bolder changes are made in order to rebracket. The following description of training devices and a typical practice range adjustment will give a better idea of the problem and its solution.

Training in range adjustment is carried on as a game by means of two boards. The A board consists of a drawing board or other board on which a sheet of paper can be tacked. An arm graduated in range yards is pivoted on the board as shown in figure 1. The pivot represents the gun position. Any hypothetical course is drawn on the board, a rate of speed is assumed and the course is marked off in intervals corresponding to the travel of the target during firing intervals.

The B board is simply a cross section chart with ranges and elevations vertically and firing intervals laterally as shown in figure 2.

A typical practice adjustment is shown in figure 2 for the course shown in figure 1. It is conducted as follows. A course is marked on board A by X, the board operator, who does not allow Y, the adjuster, to know what the course is to be. X swings the range arm to point 1 and sees that the range is 7,750 yards. Since Y has no way of guessing the range in this case X starts him off with a false range which in actual firing would be a reasonable guess, and calls to Y. "Your first shot is 8,000 yards and is over." Y marks O on his board at 8,000 for the first shot and orders 7,000 yards. X swings the range arm to the second point on the course and sees that a shot fired at 7,000

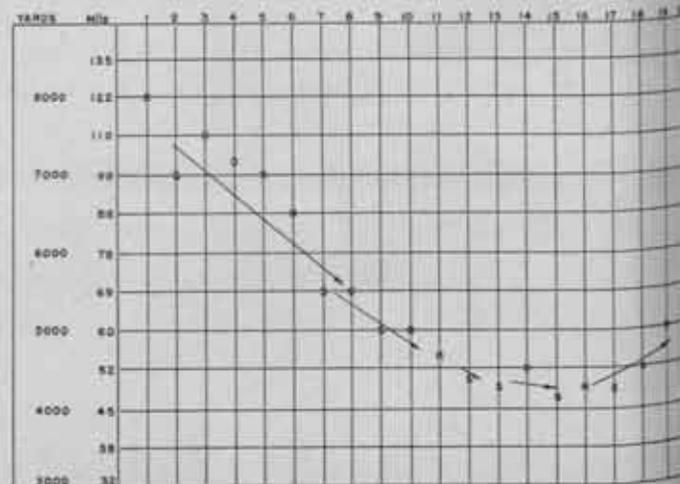


Figure 2

shots would be short and so calls "short." Y marks S for shot 2 at 7,000 and orders 7,500 thereby splitting the bracket. X swings the range arm to point 3 and reports "over." Y marks O on his chart at 7,500 on the vertical line for shot 3. He notes he has a 500 yard bracket between shots 2 and 3 and decides to split it to the nearest even 100 yards so orders 7,200. Swinging the range arm to point 4, X finds that 7,200 is beyond it so senses the shot as over. If the target were stationary X would know that he has a 200 yard bracket between shots 2 and 4, but since naval targets are often perverse enough to wander about the ocean at high speed, such a bracket cannot be assumed. Brackets are considered to exist only between successive rounds. Therefore, since Y has two successive overs he drops to 7,000 for shot 5 (the same range as for shot 2) and again gets an over.

At this time Y can see that he no longer has a bracket and that the course is incoming. Fortunately he cannot see the target and jump to any conclusions based on what he thinks he sees, so he follows the rule which calls for a bold change when three shots fall in the same sense. He shortens his range 500 yards and fires shot 6 at 6,500 and gets his fourth successive over. By this time Y is beginning to utter strong words and suspects that X probably cannot even read figures. However, as a last resort he again follows the rule, doubling his last correction and drops a thousand yards to 5,500. He is rewarded with a short. Y now has renewed faith in human nature and a clear indication of a rapidly incoming course. By drawing or visualizing a line through the brackets between shots 2 and 3 and between 6 and 7 he has a general idea of the rate of range change, and may attempt approximate range prediction. He decides to fire shot 8 at the same range as shot 7, 5,500 yards, and gets an over. This gives Y a better idea of range and its rate of change and actually is close. He fires shot 9 at 5,000, gets a short and fires shot 10 at the same range and gets an over thereby again bracketing the target with two shots fired at the same range. Reference to the tabu-

lation and to figures 1 and 2 will show how the adjustment was continued.

In the example just outlined a difficult course was selected in order to show adjustment on a rapidly moving target with a course causing large changes in the rate of range change. The target ran out of the original bracket and had to be rebracketed, and the eighth shot was the first hit. As a rule the first hit is obtained sooner. From this point on, the average range was 4,700. The danger space for one type of projectile fired from the M1918 155mm gun with normal charge would be broadside 81 yards, bow on 125 yards. Thus it can be seen that after the seventh shot range accuracy was sufficient to produce five broadside and four additional bow on hits.

In the foregoing example it is assumed that each shot is spotted correctly, whereas in actual firing conditions some of the splashes would be too far right or left to be sensed and would be called doubtfuls. A doubtful is marked as such on the B board and disregarded in the adjustment. The introduction of an occasional doubtful during practice helps to simulate service practice conditions.

Gun dispersion has not been considered in this example of adjustment. If desired it can be simulated by the use of a dispersion tape and adding algebraically the effect of dispersion for each shot to the range called for.

Adjustment is shown in terms of range (yards). In actual firing an initial range is estimated and the first round fired at the corresponding elevation. From that point on range in yards is no longer considered. Instead, bracketing is conducted entirely in terms of elevation. An average change in elevation corresponding to 1,000 yards, such as 20 mils is used as a basis of adjustment. Brackets are split only to the nearest mil.

The following rules of adjustment are used:

1. Before approximate rate of range change has been determined:

a. Range changes of 1,000 yards (in terms of elevation) are made until the target is crossed.

b. The 1,000 yard bracket is split.

c. Smaller brackets are split when successive rounds are of opposite sense.

d. If two successive rounds fall in the same sense the amount of the next correction is at least as large as the previous one. In other words, the next round will be fired approximately at the same range as the shot immediately preceding the two in the same sense.

e. If three successive shots fall in the same sense a bold change in range is made, at least 500 yards. If this change does not result in a bracket the range change for each successive shot is doubled until a bracket is obtained.

2. After approximate rate of range change has been determined:

a. The course of the target is followed as closely as possible by continuous close bracketing.

b. If three successive shots fall in the same sense the procedure previously outlined in 1. e. is followed. The B board is used in the actual conduct of fire, but gun commanders must not be dependent upon it. They should be able to follow the general procedure and adjust their fire without the aid of any chart or other device. Otherwise, the

Shot Number	Range Ordered	Sensing	Range to Point	Deviation
1	8,000	O	7,750	+ 250
2	7,000	S	7,440	- 440
3	7,500	O	7,120	+ 380
4	7,200	O	6,800	+ 400
5	7,000	O	6,500	+ 500
6	6,500	O	6,120	+ 380
7	5,500	S	5,800	- 300
8	5,500	O	5,450	+ 50
9	5,000	S	5,160	- 160
10	5,000	O	4,900	+ 100
11	4,700	Hit	4,700	0
12	4,400	S	4,500	- 100
13	4,300	S	4,350	- 50
14	4,500	O	4,250	+ 250
15	4,200	S	4,250	- 50
16	4,300	Hit	4,300	0
17	4,300	S	4,450	- 150
18	4,500	S	4,650	- 150
19	5,000	O	4,840	+ 160
20	5,000	Hit	5,000	0

loss of a pencil or misplacing of a board could hold up the fire of a gun.

Initial deflection must be determined very simply and quickly. Timing of travel and computations are not suitable for this type of action. The method used is as follows. The lateral component of the target speed is estimated. A deflection is then set in which the number of mils is equal to the estimated miles per hour of lateral travel. When deflection is set in degrees one division of .05 degree instead of one mil is set for each mile per hour. The rule given to the gun commander is a "mil per mile." The "mil per mile" deflection can be improved by adding or subtracting two or three mils for drift. Deflection is adjusted by splash jumping during fire.

Spotting is of course very important as the success of the method of adjustment depends upon accurate sensing of each shot. As a rule, the observer on duty at the B.C. station spots without order the fall of each shot and telephones his sensings to the gun pit. The gun pointer also calls out the sensings, and the gun commander designates one member of the gun crew to spot with his naked eyes. Accuracy of spotting is definitely improved by securing sensings from more than one source, which does not cause confusion in this type of action.

Training is carried on at the guns by alert crews on duty as follows:

1. A and B boards are used for training in fire adjustment.
2. Practice in range estimation is obtained by estimating ranges to passing vessels and checking with the range finder or D.P.F.
3. Practice in deflection estimation is obtained by estimating deflections by the mil per mile method and comparing the result with deflections more accurately computed.
4. Axial spotting training is obtained by spotting without height of site from the water's edge, splashes from .30 caliber rifle bullets fired at a small target about one thousand yards from shore. Each student records his spots and after each short series of shots his sensings are compared to sensings obtained by more accurate methods. Accurate spotting can be obtained from a nearby tower. A cliff 100

or 150 feet high is better than the tower, provided students have to climb down the cliff to their beach spotting position and if practice is held frequently until students are proficient.

The advantages of these training methods are as follows:

1. Fire can be opened in a minimum of time.
2. The method of fire adjustment is simple and will produce hits on moving targets on straight or maneuvering courses.
3. Rate of range change is developed directly by the method of bracketing, and it is unnecessary to depend upon personal skill in estimating course and speed.
4. The use of A and B boards for training gives practice in fire adjustment without ammunition expenditure and has the advantage that it may be used as a game by bored artillerymen tired of crap shooting.

A number of special service practices using gun commander's action have been fired at one station during 1942 and 1943. Since the adoption of the methods described a 73 per cent increase in hits has been obtained in gun commander's action service practices at this station. Analysis of reports from these practices shows that the percentage increase in hits could have been at least twice as great had these methods been strictly followed. For this type of practice the average time from target assignment till the first hit was less than from target assignment till the firing of the first round with conventional methods.

Failure to obtain this further improvement is directly traceable to the following:

1. One or more erroneous spots.
  2. Attempting to give magnitude to sensings such as "near" over or "way" over, or calling splashes hits when they appear "about right" for range. Even though the sensing is correctly called the gun commander can lose its value by giving it magnitude in his own mind and acting accordingly.
  3. Failure of the gun commander to follow adjustment rules because of his own "belief" in what he thinks about the target course and speed from watching it.
- Excellent results are obtained when the gun commander turns his back to the target and adjusts fire entirely on called sensings.



For heroes have the whole earth for their tomb; and in lands far from their own, where the column with its epitaph declares it, there is enshrined in every breast a record unwritten with no tablet to preserve it, except that of the heart. These take as your model, and judging happiness to be the fruit of freedom, and freedom of valor, never decline the dangers of war.—PERICLES.

# Cable Laying: A Solution

By Captain John P. Buck, Jr., Coast Artillery Corps

The use of submarine telephone cable in Seacoast Artillery is certainly nothing new, and its installation, where the usual facilities are at hand, is nothing more than a routine function for the Artillery Engineer.

Accessible to many a harbor defense for this purpose is a regular cable-laying vessel equipped with one or more large reels as part of its permanent gear, these reels being operated by power much in the fashion of a winch and capable of receiving or paying out thousands of feet of cable which may be required in an undertaking. Such a vessel often has all facilities for quartering and messing the men who may be required in the operation of cable laying without interruption, sometimes for days, until a job can be completed.

In a project of laying submarine telephone cable in one of our recently acquired Pacific bases where none of the ordinary facilities for the job were at hand, many problems were presented, and it is hoped that the experience gained may prove of value to others.

The author, as communication officer of a separate harbor defense battalion which landed at a Pacific base some months ago, was directed by the harbor defense commander to install a permanent observation post on an island some few thousand yards off shore.

It was obvious that satisfactory communication with the island was the problem to be solved. Radio was ruled out; field wire was impracticable; and because of the number and variety of messages that might be essential it was decided to install a multi-conductor, armored submarine cable.

A requisition for the necessary length of 26-pair cable including the necessary splicing material and spare parts was prepared. The days of waiting were not long, and before we had any right to expect it the cable was landed.

In the meantime, plans were being made for the laying. Quonset barges were obtained as cable-laying vessels. This type of barge is much used in foreign bases for unloading of supplies from ship to shore. It is built of box-like steel pontoons tied together with steel strips, so that a barge of the desired size can be formed. The most common barges are forty, sixty, or one-hundred and twenty feet long and from twenty to forty feet wide. Power for the barges is normally supplied by a Diesel engine mounted on the after end and driving a propeller in much the same manner as in the common outboard motor. Steering is accomplished by turning the propeller housing. By turning the housing 180° propulsion is reversed in direction.

Two barges were required and obtained, one without power unit for holding all apparatus and material, and the other with power unit for use only during the actual laying.

The cable was wound on four large reels eight feet in diameter and each full reel weighed about four tons.

In order that each reel could be successively spliced to the next preceding reel as the cable was run out the reels were arranged in column along the center line. Each reel was suspended on a separate axle with sufficient space be-

tween reels to permit splicing details to work and men to pass.

To support the reels a reel mount was constructed. This mount consisted of two parallel walls of heavy timbers laid on the deck of the barge and parallel to the center line. The two walls were slightly more than the width of the reels apart. The length of the walls was sufficient to accommodate the four reels at one time and afford working space between reels.

As the walls were constructed of many separate timbers it was necessary to nail them together as they were laid in place. Side bracing was provided by nailing angle braces from the upper edges to side pieces projected across the deck. Cross pieces were used to tie together the lower layers of the two walls.

Except for fifteen feet at each end of the barge, the reel mount extended the full length of the barge.

The axial hole in each reel was only 2¾ inches in diameter. All steel stock available and which might be satisfactory was tried as axles, but bent and buckled under the weight of the reels. Fortunately, a shipment arrived which included some steel shafting and satisfactory axles were found in this material.

Having assembled all material and built the reel mount, the reels were put in position. They had been landed about fifty yards off the dock and a small caterpillar tractor was employed to push and guide the reels onto the pier and barge. To check the rolling reels, wooden chocks were dropped in their path, and that method of checking combined with the slipping of the tractor treads on the steel deck and the tipping of the barge with the movement of the tractor and reel made an interesting and absorbing problem of loading.

Railroad jacks were placed under the axles and the reels were raised so that ten-inch blocks could be put under the axles and connecting with the end of the reel mount.

The reels were then moved to the desired positions on



Each reel of cable was finally emplaced by jacking the ends of the axle clear of the timber cribbing and putting block supports in position.

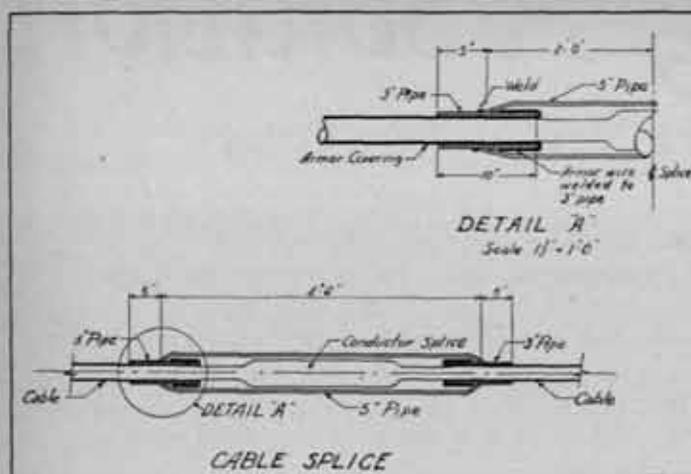


Figure 1

the mount and the axles lowered into notches previously prepared. Blocks were nailed in place to secure the axles in position.

To insure free-turning of the reels a cross-section cut from a three-inch pipe was inserted on each axle on each side of a reel before jacking up and moving into place on the mount.

To pay out the cable it was desired to run the cable off the barge over some kind of wheel or pulley. A steel sheave was borrowed from the boom of a steam shovel and welded to the stern of the barge. Cable was to be paid out from the underside of the reel and over the sheave.

A braking system was essential. The turning of the reel as the barge got underway and the great weight of the cable hanging from the reel to the sea bottom demanded some positive system of braking. This was accomplished by bending two 12-foot lengths of five-inch I-beam into an arc along the circumference of the reel. The four-inch thick ends of the reels fitted nicely into the channels of the five-inch I-beams and these channels kept the brakes in place. The brake bands fashioned from the I-beams were anchored at their forward ends by shackles and the other ends were linked to a length of pipe to furnish leverage.

It was found that one man on each lever provided sufficient braking force and control under all conditions encountered.

In making the splices between the four lengths of cable contained on the four reels it was desired to preserve the armor strength throughout the length of the completed cable. This was accomplished as follows:

A ten-inch length of three-inch pipe was slipped over each of the ends to be spliced. Then a four-foot length of five-inch pipe was slipped over one of the ends of the cable to be spliced. This piece of five-inch pipe was previously prepared by cutting large saw-like teeth in each end so that the teeth could be bent inwards to form a bell-shape to fit over the sleeves of three-inch pipe.

After the conductors in the ends of two cable lengths were spliced, the three-inch pipe sleeves were positioned so that their centers were two feet from the cable splice.

The strands of the wire armor on each of the ends were then bent back over its sleeve and welded to it. The four-foot section of five-inch pipe was then slid over the two smaller sleeves so that each end was at the center of a small

sleeve. The sawteeth in the larger sleeve were then bent down snugly around the small sleeves and welded in place. Thus the armor, welded to the three-inch sleeves which were welded to the joining five-inch sleeve was made continuous and the five-inch sleeve afforded almost perfect protection to the splice itself. (Fig. 1.)

An arc welding machine was used for all welding and was placed on the port side of the forward edge of the barge.

When commencing to lay the cable and when nearing the far shore it would be necessary to go close inshore until the barge was lightly touching bottom. In order to avoid propeller damage and the necessity of turning the barge which would put a turn or cross in the cable the separate power barge was initially tied to the off-shore end of the cable barge and held the barge against the near shore; during the paying out of the cable in crossing the channel the power barge merely reversed its propeller and towed the cable barge; on nearing the far shore the power barge was tied alongside the cable barge and well aft and pushed the latter into the beach.

It was decided that some form of anchor should be installed on the beach near each cable end to prevent the cable being pulled out of place. Each cable anchor was constructed of a longitudinal timber eight feet eight inches in length and six inches by six inches cross section to which were bolted four crosspieces six feet in length and spaced two feet center to center. The longitudinal member was drilled to receive five U bolts  $\frac{3}{4}$  inch diameter and three inches span.

An excavation five feet deep and shaped to receive the multiple cross was made on each shore near the location for the terminal huts. The anchor was laid over this excavation with cross members resting on the unexcavated portions. A trench leading from the water to the anchor position was dug. When the cable was brought ashore at either end it was passed over an anchor; the U bolts were inserted and made fast, and the anchor dropped into its excavation. Covered and well-tamped it afforded the desired cable anchorage.

With everything in readiness we shoved off from the pier at 1300 one afternoon and the laying and anchoring of the cable was completed by 1700 two days later.

Taking each end ashore was a tremendous job since it



The beginning of actual laying. Plenty of power on the brakes to see that nothing gets away.



Showing a splice completed in the cable itself. The outer sleeve will be slipped into place to connect the sections of armor.

had to be accomplished entirely by man power. The cable had great weight even in short lengths and since each end had to be carried about fifty yards inland on either shore, the communication detail was insufficient to do this part of the job. A full platoon of one of the firing batteries assisted in this particular part of the operation only.

Working after dark was avoided throughout the operation. Bedding and cots were taken aboard the barge. Hot meals were sent by boat from the camp mess. A three-day supply of Class C rations was taken along to provide for interruption of supply from camp.

On the first day the near shore end was firmly anchored. At daylight the second day the propeller started in reverse and cable was soon being paid out at a speed of three knots. In less than fifteen minutes the first reel was emptied. The cable paid out provided sufficient anchor while stopped for splicing. It was necessary to put a "stopper" on the cable where it passed over the sheave to keep the strain from the end held for splicing.

The complete process of making each splice, to include uncovering the armor and cleaning the exposed ends of the lead covering, required about four hours. The strands of heavy steel wire armor had to be cleared from around the lead covering the cable itself and then bent back over the lengths of iron sleeves and welded down. The lead had to be cut from around the twenty-six pairs of copper conductors, and then each of these conductor pairs had to be spliced by twisting and soldering the individual wires. Each of these small splices had to be insulated by slipping small paraffin-soaked cloth sleeves over them. To chase out all moisture which might have gotten into the open ends of the lead covering and to provide a moisture-proof coating over every bit of the surface of the conductors, boiling paraffin was dipped and poured over the conductors and over the length of the lead covering from which the armor had been peeled.

Next a lead sleeve was slipped over the exposed conductor pairs and belled down to join the lead covering, much the same as the outer sleeve of iron pipe was belled down to join the armor covering later on in the process. The joint was then "wiped" by pouring molten lead into a fire-proofed rag held in the hand of the wiper. A small hole was then drilled into the sleeve; the splice was poured full of

boiling paraffin, and the hole was finally closed by soldering. The entirety of the lead covering to the points where it started into the armor was then painted with a thick coat of molten pitch. The four-foot length of iron pipe was then centered over the splice; its ends were belled down to join the smaller iron sleeves; the joints thus formed were arc welded; and finally this outer splice of the armor covering was poured full of molten pitch through a hole prepared in the pipe for this purpose. The pitch upon solidifying and cooling, left the splice completed, and the process of cable laying was then ready to go on.

Before the laying was resumed after this first splice was made, we took time off to eat a hot noon meal which was received just as this morning's work was being completed.

The laying was resumed at about 1300, and the second reel of cable was paid out as quickly as the first. The barge arrangement which at first was feared as having none too much motive power for the comparatively big job of propelling such a load against the added drag of the cable as it unwound from the reels, continued nevertheless to make steady headway. The point on the shore of the mainland where the final end was to be landed, had been suitably marked before the operation by constructing a pyramidal beacon about ten feet in height made of cardboard and wood and painted white. This mark was easily distinguished from the opposite shore and enabled the barge to make a perfect course.

Upon expending the second reel of cable, its end was secured with rope for preparing and splicing. Since darkness was coming before a second splice could be completed, only the armor was cleared from the lead covering of the ends and the lead cleaned with gasoline. The decks were cleared up, and everything was made fast for the night.

With much of the preparatory work already done, it was possible the next day to finish the splice well before noon. Since additional help would again be needed in taking the final end ashore, the laying was not resumed until a message requesting the necessary men was dispatched on the boat returning to camp which had brought us our noon meal.

At about 1300 we resumed our course for the laying of the final reel of cable. We were a little less than 600 yards from shore, and after making headway for five minutes we were so near shallow water that we stopped and untied the



Climbing back aboard after the initial cable end had been anchored ashore on the island.

powered barge from its position of pulling and tied it alongside the cable barge.

Upon then resuming the course, it was difficult to make directly for our intended spot because of the unbalanced thrust being imparted to the arrangement. Steering could effect only a partial compensation, and upon our touching bottom about sixty yards off shore, we were displaced laterally about forty yards from the point where the cable was to be landed. This made for a slightly longer distance over which the cable had to be carried, but it was not a serious problem.

As each complete length of cable had been laid, the empty reel had been easily removed from the mount and pushed to the side of the barge in order to facilitate the cable's running unhindered to the sheave and to enable the hooking up and operating of the brake mechanism on the next reel. Upon touching the final shore, however, we became faced with a problem as to how the laying could be completed without hindrance, since the cable instead of being taken off the after end would have to be taken forward toward the beach. It was found we had one reel of cable too much. It was necessary to by-pass the extra reel which could not be displaced in order to clear the way. A solution was finally reached by handling the cable as though the portion leading aft were the standing part of a rope and the portion to be taken ashore, the running part. The men by grasping the sides of the reel were able to turn off enough cable to form a bight which taken over the top of the reel of unused cable, was then ready to be caught by all available hands and gradually worked toward the beach.

Although the anchorage for the cable was on the beach, the nearest protected spot for the terminal was about fifty yards further. This distance was finally covered with the cable, but only by extreme effort on the part of the forty-odd who had to carry the entire length of the running section and the bight.

The cable was secured to the anchor; the anchor was dropped into its prepared position; and the length of cable from shoreline to terminal was buried. The bight was cut at the terminal position and the ends were soldered closed to prevent moisture from entering. It was planned to install the terminals later as a separate operation.

That portion of cable which had been brought ashore as the running part had to be rewound. The job was finally completed by 1700 and our barge again backed off into deep water. Within the hour we were once more tying up to the dock from which we had pushed off two days before.

The next day was spent in unloading all our gear and knocking down the structures we had erected on the deck.

The terminals for either end of the cable were the regulation Signal Corps JB-13, twenty-six pair junction boxes. We installed them during two days of the following week. The process of installation was very much the same as that of splicing except that no armor covering was required to surround the splice. The armor covering was cut away from about three feet of the cable. A splice to the junction box's own short end of cable section was made. Then the whole section of exposed lead covering was straightened vertically and the junction box was fixed from three to five feet off the ground on its mount. In each instance the mount selected was rock formation, and we star-drilled the small holes which were necessary to receive the attaching spikes.

When installing the second junction box it was necessary to insure that each conductor pair connected with correspondingly numbered terminal posts on both boxes. This was accomplished by having one man connect a test telephone to each set of terminal posts in numerical order while another man on the opposite end tested until he had located the live conductor pair. This was then spliced to the conductor pair attaching to terminal posts of like numerical designation on the junction box finally to be installed.

Installation of the junction boxes put the cable in complete readiness for use. The JB-13 junction box is absolutely moisture proof. It is provided with a slip-over type metallic cover for the terminal posts where the conductor pairs of the telephone wires attach, and no additional housing is necessary. The exposed section of lead covering leading into the ground, we enclosed in wooden boxing three inches on each side and extending vertically from the junction box to the depth at which the cable was buried.

With the cable installed, field wires were quickly run to form the final link in the communications between the mainland and the outposts stations, and a satisfactory system was established.



The application of Preventive Maintenance in the combat zone must be *instinctive*. Hence, the soldier's safety and that of his comrades will one day depend upon his diligent application to details of Preventive Maintenance procedures while he is in training.

# British Against Germans\*

By General Sir Bernard Law Montgomery

## The Soldiers

The German soldier is a very good fighter, and it is a great mistake to suppose that he is finished and that the war will soon be over. He is not finished at all. The German general is a first-class, highly trained professional soldier, and he is particularly good if you allow him to do what he wants to do.

A battle is really a contest between two wills. If the German general is allowed to dictate the battle he is good. On the other hand, he is dictated to, he is inclined to get rattled, and there is no doubt that in the battle of Alamein and subsequent operations Rommel did get rattled.

The German soldier is a very good fighting man, and he has three characteristics that stand out. First, he is very good technically in handling his weapons. He is very good with his tanks, and also very good is the German organization for keeping his tanks in action, for picking up damaged tanks on the battlefield, for repairing them and getting them back into action again.

Secondly, the German soldier has a very good eye for country and the reason for that is that as children they play their games as military games. In those games they pick up military positions and the result is that the German soldier has a very good eye for country which stands him in very good stead in battle. He is quite first-class in making the best use of the ground he finds himself in.

The third point is his complete and absolute obedience. He obeys because he does not know what is going on, and he obeys blindly. Early in the pursuit battle we captured a German soldier at some crossroads at Mersa Matruh. The intelligence officer asked him what he belonged to and what he was, and his reply was: "I do not know. I was flown over here from Vienna and I was told to stay at these crossroads and here I am."

I would say that the chief difference between the German and the British soldier is that the German soldier laughs at other people's misfortunes while the British soldier laughs at his own misfortunes. The German soldier cannot stand up to really heavy concentrated artillery fire combined with air bombing, and that is one way in which we can get him in.

The German soldier is inclined to become a little stupid through over-indulgence in sun-bathing and in a country where the sun can be hot we have noticed that the soldier was becoming muddle-headed. The German soldier is not the strong, robust sort of man that people think he is. The death rate among the Germans was always far higher than it was in the Eighth Army. He suffered a great deal from rheumatism and stomach complaints and was nothing like as healthy and fit as the average British soldier.

There have been several cases of German and Italian

officers being captured in their pajamas. In battle you would never find a British officer in his pajamas.

The big battle-winning factor is morale, and the side whose troops possess the higher morale will win, other things being equal. I will say this for the British soldier, that you can work him up to a high pitch of enthusiasm in battle, and I think that of all the types in the Eighth Army the one easiest to work up to the greatest pitch of enthusiasm is the Scottish soldier of the Highland division.

The morale of the soldiers in the Eighth Army is quite amazing. It is so terrific as to be almost dangerous. They look upon themselves as an invincible army that can do nothing wrong.

You can be absolutely assured that the British troops in North Africa had only one idea, and that is that they would see the thing through to the end.

## The Tactics

There are three broad principles which governed all the tactics employed from Alamein to the breaking of the Mareth Line.

First, I always aim at making the enemy dance to my tune. That is to say, if we want to beat the German generals—and the German generals are very good—we have to dictate the battle. To do that we have to decide in our minds, before the battle begins, how we want it to develop. We then use the military power at our disposal and force the battle to swing our way.

The second point is that when we are fighting a battle we must always be so balanced or so poised in the whole area of operations that we are able to pursue our plans ruthlessly and never have to react to anything the enemy may do.

The third point is of great importance. We must strive to gain the initiative, and having gained it to keep it.

The problem at Alamein was how to break through the German lines. Those lines extended for forty miles from the sea to the Qattara Depression. The principle was to dictate the battle and to use all our military power to force the battle to swing our way. If you apply that doctrine to the offensive battle, it means that we had to start by hitting our enemy a really hard blow and then follow it up with smaller blows so that we kept our initiative all the time.

The tactics of the battle of Alamein were to make a deep thrust to drive a deep wedge in the enemy's lines, followed quickly by a number of additional attacks which forced the enemy to use up his reserves in attempting to stop holes by frequent counterattacks.

The main thrust was made in the north while diversionary attacks were made in the south, which successfully contained a proportion of the German and Italian armor.

Very bitter fighting took place from October 23 to November 3, during which our infantry attempted to blast a way through the enemy defenses through which our arm

\*Extracted from a speech by General Montgomery, reprinted from the *London Express*, London.

could pass. At last the way was cleared, and on November 4 our armor passed through the last of the defenses in pursuit of the withdrawing enemy.

Then the great pursuit battle began and the Germans tried to stand in a great many places. They tried to take up a line at Mersa Matruh, Sidi Barrani, Sollum, Halfaya Pass and Tobruk. The major tactics of the pursuit battle were to drive hard down the main coast road while armored forces operated in the desert and came in whenever the enemy tried to make a stand.

On we went until we came to El Agheila which had a marked psychological effect on the Eighth Army because it was thus far, and no farther, that British troops had been before. It was a strong position. We dealt with that position and passed through it, and once we were through, all the psychological effect of what had happened before began to disappear.

Finally, we came to Tripoli. As we were approaching Tripoli I knew the big nut to crack was the Mareth Line which, with the Gabes Gap, was a strong natural position.

The battle for the Mareth Line was the most interesting of all the interesting battles of the North African campaign, and I began to consider the problem of attack three months before I came to it. It was quite clear to me that the main feature must be an out-flanking movement, but I also considered it necessary to put in a frontal attack somewhere against the Mareth position.

I have no doubt that when the story of the war comes to be written by historians I shall be criticized for many things I did, and one of them will be for launching a frontal attack against the Mareth Line, which was rather like the Maginot Line.

First, a big blow was delivered against the Italians on the right, and it was successful. A wedge was driven through the main minefields and obstacle lines, and after two days that movement had so developed that it became very threatening to the Germans, who dared not ignore it.

Reserves were moved from the south to the north with this thrust and these reserves were so good and strong that they pushed me out. I lost the ground I had gained and the next thing was an announcement by Mr. Churchill in the House of Commons that the Eighth Army had suffered a setback.

I have been told that everybody in England thought the war was over. I had to take a quick decision, and I think that the decision I took was probably the turning point of the whole of the North African campaign, because the Germans knew quite well that, if once the Eighth Army broke through this line and got through the Gabes Gap and marched into the broad plain of Tunisia, the end of the campaign would be for them only a matter of time.

The decision taken was to strengthen substantially the flanking movement in the south, and it was the powerful drive put in south of El Hamma that finally drove the enemy from the Mareth area. The Germans rushed their reserves to try to stop the rout but they were twelve hours too late.

The last point of interest is the problem of the Gabes Gap. That was a strong natural position, and the point was what we were going to do about it for we were now in the dark period, and all our operations had hitherto been carried out in the moonlight period. I had to decide whether I would take a chance in the dark period, or whether I would wait for the moon and give the enemy a fortnight in which to strengthen his position.

I decided to do two things I had never done before. The first was to attack in the dark, and the second was to attack in the center, in the middle of the Gap. The enemy was so surprised by those two things that the Eighth Army broke through the Gabes Gap in one day. Later on I asked General Messe, the Italian commander, after his capture, if he expected the attack, and his reply was: "We thought you would wait for the moon. We did not reckon on an attack for a fortnight."



## NOTICE

The JOURNAL is most anxious to be of service to men overseas everywhere. The JOURNAL will try to procure and mail any article desired. However, in rendering this service the JOURNAL cannot be responsible for loss or damage as insurance on overseas shipments is not procurable. The JOURNAL will endeavor to see that articles are carefully packed and shipped to the address last furnished. Our responsibility ends there. Loss or damage is at the buyer's risk. It is believed that all purchasers will readily see why this is necessary, and that they will cooperate fully.

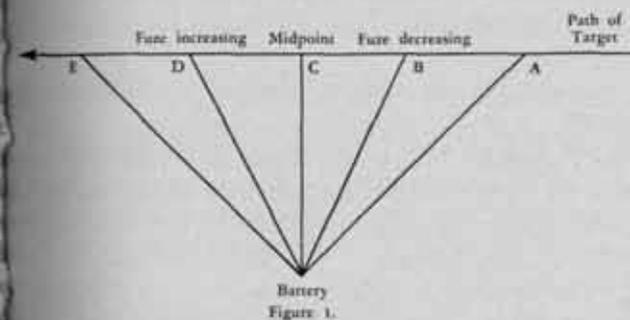
# What Is Your Dead Time?

By Major George A. Hoffmann, Coast Artillery Corps

The author has noticed a wide-spread misunderstanding of the definition of the dead time of a 90mm gun battery, and of the method of measuring it. There is also a general lack of appreciation of the value of having the correct dead time set into the director.

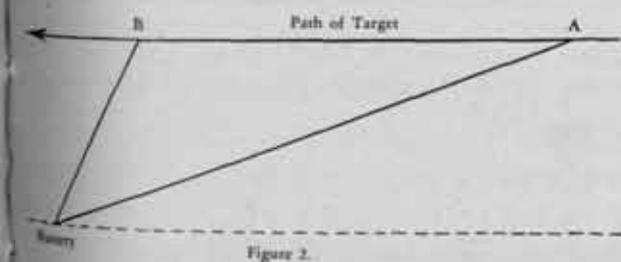
Directors correct for dead time by calculating fuze prediction. This fuze prediction is combined with the fuze value and the algebraic sum is sent from the director to the guns. The net result is to cause the fuze on each projectile to be set to a value which will be the correct value at the instant that projectile is fired.

Directors calculate fuze prediction from the rate of change of fuze; that is, the amount which the fuze is increasing or decreasing per second. The faster the fuze is changing, the more fuze prediction is necessary. For instance, on a crossing course, the fuze is decreasing on the incoming leg, becomes a minimum when the future position is at the midpoint, then increases on the receding leg as shown in Figure 1. The fuze is decreasing more rapidly



at A than at B. There is no change in fuze at C. The fuze is increasing more rapidly at E than at D.

On an incoming course directly at a battery, as illustrated in Figure 2, the fuze is decreasing faster at A than at B.



Rate of change of fuze depends on the speed of the target and the direction in which it is flying with respect to the battery. For instance, fuze decreases faster on a target flying directly at a battery than on the same target on the incoming leg of a crossing course past a battery.

Because rate of change of fuze is so variable, a flat fuze prediction will not work. It would be accurate for only one point on a course. Notice that at the midpoint of the crossing course shown in Figure 1 fuze prediction is zero. There are many directors in service which do not have fuze prediction mechanisms, and the fuze spot dial must be used to

correct for dead time. Once the dead time of the battery is determined, rate of change of fuze can be calculated for various speeds and courses and with this information the fuze spot dial may be used to vary the fuze prediction to correct for dead time.

If an incorrect value of dead time is set on a director having a fuze prediction mechanism, the fuze prediction will be incorrect, and an error in fuze range will result. Since errors in fuze range constitute the greatest source of error in guns firing time-fuzed projectiles, it follows that every precaution should be taken to obtain accuracy in range.

The definition of dead time given in one manual is as follows: "Dead time is the average time interval between fuze setting and the firing of the gun." This definition is quite true but has led to two false impressions:

(1) That the value set on a projectile when it is seated in the fuze setter and the fuze setting operation performed is the value that will be set on the projectile when it is removed from the fuze setter, regardless of anything else that might happen.

(2) That dead time is based absolutely on rate of fire. That is, that the dead time of guns maintaining a rate of fire of fifteen rounds per minute is four seconds, and the dead time is three seconds for a rate of fire of twenty rounds per minute.

As for (1), once a projectile is properly seated in the fuze setter and cut, the fuze setter pawls remain engaged and the fuze setting is continuously changed as the fuze range setter (Number 5) turns his handwheel, provided pressure is maintained on the base of the round to keep the projectile seated. It is the value to which the fuze is set when the projectile is removed from the fuze setter that counts.

As for (2), a gun crew whose average dead time is two seconds may take its time between shots and actually deliver fire at the rate of five shots per minute. It is generally true that the higher the rate of fire the lower the dead time. There is a certain amount of correlation but dead time cannot be measured by the rate of fire.

Perhaps the matter will be clearer if the following definition of dead time is considered: "Dead time is the average time interval measured from the instant the projectile is disengaged from the fuze setter pawls to the instant at which that projectile is fired."

This definition indicates the points between which dead time is measured. Measurements of dead time taken during dummy drill are of little value—actual firing is best. If a stop watch is obtainable which will permit the accumulation of the dead time intervals during the firing of a series of rounds in continuous fire, the best possible determination of dead time can be made. The watch is started each time a round is pulled out of the fuze setter and stopped when it is fired from the gun. The total number of seconds divided by the number of rounds fired is the dead time. Watches of the type which must be read after each time

measurement and then set back to zero before the next measurement, will not allow the timing of as many shots as the type described above.

The average dead time of the four gun crews should be the figure used. Considerable difference will be noticed between different gun crews, due mostly to the skill of the Loader (Number 4). Every effort should be made to equalize gun crews. A low average dead time figure is not as desirable as one from which the various gun crews do not deviate greatly. Timing for dead time must be a continuous process during training as the proficiency of gun crews increases. Whenever continuous fire is to be conducted during training, provision should be made to check the dead time at each gun.

It will be found that with manual loading the dead time will be greater when firing is conducted above elevations of 800 to 1000 mils than when firing at lower elevations. With power rammer loading dead time is greater than with manual loading, but does not vary to any great extent with the quadrant elevation.

Let us now investigate the error that will be caused by using no dead time figure or an incorrect figure. Assume a target is coming directly at your battery at an altitude of 6000 yards and a speed of 300 miles per hour (150 yards per second). Assume you engage the target at a point such that the horizontal range to the future position is 8000 yards. Assume also that you do not have a fuze dead time mechanism on the director or are not using it, and that actual dead time is, for the sake of illustration, 1 second.

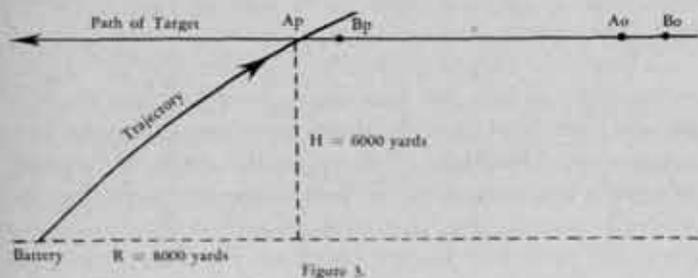


Figure 3.

The point  $A_o$  in Figure 3 is the present position of the target when the round is fired. Point  $A_p$  is the future

position calculated by the director and, everything else being equal, the trajectory will pass through this point. Point  $B_o$  is the present position of the target when the round was withdrawn from the fuze setter. Point  $B_p$  represents the corresponding future position calculated by the director at this instant.

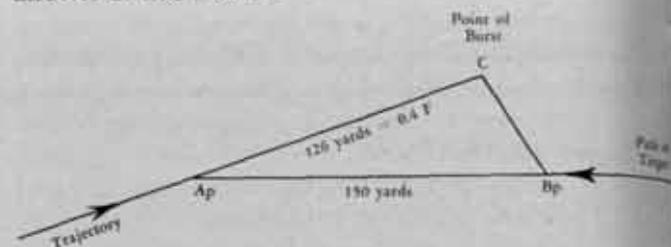


Figure 4.

The error in fuze may be determined graphically as shown in Figure 4. The target travels 150 yards in one second of dead time, so the fuze was actually set for a target at a future position represented by point  $B_p$ . The trajectory is drawn through point  $A_p$ , and a  $\phi$  line (line of constant fuze) drawn to the trajectory through point  $B_p$ . The projectile would burst at point  $C$ . The fuze error measured between points  $A_p$  and  $C$ . It amounts to 0.4 and the shot would be over.

Assume now that you have set a dead time of two seconds on the director, but the actual dead time of the battery is two seconds. This case is just the reverse of the preceding illustration. The amount of the fuze error will be the same, but the sense will be minus and the shot will be short.

When a dead time value greater than the actual dead time is set into the director, the director calculates an excessive fuze prediction. On a crossing course, this would cause the shots to be short on the incoming leg and over on the receding leg.

Errors due to inaccuracies in determination of dead time do not show up to as great an extent in training as they will in combat because of the slower target speeds encountered in training.

Better get out the watches and start timing. It will pay dividends in accuracy.



How important is tire maintenance? Here's what TM 31-200 has to say about it: "When a tire fails, the entire vehicle may be put out of action, together with its load of troops or supplies. In actual combat, tire failure may bring defeat of a local military mission."

# THE EUROPEAN FORTRESS\*

The German authorities have issued, inspired, and otherwise released much varied information and surmise during the past few days about preparations and prospects for the next phase of their "defensive war," especially in connection with Rommel's and Sauckel's extensive tours of inspection outside Germany—Rommel's of the long military ramparts of the fortress of Europe, Sauckel's to Paris, Rome, and other "foreign labor centers" inside the fortress itself.

Probably part of the more or less frank information given out by the Germans is mere angling for counter-information from the anti-German camp, about whose immediate intentions a great variety of copiously detailed guesses is being launched from Berlin. Some reports pretend to know just what the three allied leaders decided at Teheran and declare that German leadership is already taking effective measures to meet the menace, whose seriousness few show any inclination to minimize. For instance, Rommel's visit to "Denmark and presumably other points of the long European defensive and offensive front" is explicitly represented in the German Press as part of Hitler's prompt and direct response to Teheran; and casual remarks imply that Hitler designated Rommel as a sort of General Officer Commanding the fortress of Europe.

## AWAITING THE ATTACK

Most authoritative German commentators no longer scout the idea that the British and Americans intend to attack the western wall of the fortress; on the contrary, all now agree that this attack is certainly coming. They also profess to believe that another route is planned into the vitals of the fortress through the Balkans, but emphasize that the allies missed their best chance there immediately after Italy's collapse, and, having dallied so long, must mark time a few months more until the rigors of the Balkan winter have passed. Meanwhile the Germans must break the back of General Tito's army and the whole of the organized Balkan partisan movement before the allies are able effectively to use this valuable base in conjunction with a real invasion.

German reports and independent information show clearly that the German High Command hope to spend the next few months profitably shuffling with the seasons. A resolute anti-partisan campaign was intended earlier but has been delayed by the scurvy behavior of the Russian weather—the merging of summer into winter without the usual muddy period—enabling the Russian offensive to continue without pause and absorbing a large part of the German effort which could otherwise have been directed to the Balkans. The Germans expect a hard winter campaign in Russia and take into account the necessity of further retreats, not only in the Ukraine and White Russia, but also on the northern half of the front. They hope, however, to maintain their front unbroken through the next few months until the spring thaw and mud which, unlike the autumn, never fail to dictate a pause in large-scale operations.

## SEARCH FOR MAN-POWER

One of the greatest problems facing the Germans is to

man the huge European fortress during the next three or four months until the spring mud brings a respite and a chance to withdraw substantial forces from Russia without undue risk. Hungarian, Rumanian, and other non-German auxiliary troops have dwindled disquietingly since 1942; but the Germans this year have been endeavoring to the utmost, and with some success, to tap the military manpower of the Baltic States, guardedly offering Estonia and Latvia national liberty in the future in return for present active military assistance against the Red Army. Estonian and Latvian potential aid is far from negligible. From a population of 3,000,000 the Germans hope to raise something like 10 strong divisions of good soldiers.

With their brutal oppression of the past two years fresh in mind Estonians and Latvians would gladly fight with the Russians against the Germans if they were given any real prospects of national independence; but, according to available direct information, unless they are given an unambiguous assurance of their inclusion in the Atlantic Charter they will assist the Germans against the Russians in the vague hope of eventually benefiting somehow from the discomfiture of both their big neighbors as they did after the last war. German efforts to create a national Lithuanian army had little success and no fresh attempt in this direction has been reported lately.

The opinion appears to be strong in German military circles that if the coastal crust of the fortress of Europe can be kept intact until the Russian spring there will be a good chance of holding the fortress until the autumn and winning some sort of compromise peace. The argument advanced in these quarters is that the British people have been promised, or definitely expect, final victory by next summer. If, therefore, victory is not in sight by then, British over-confidence will abruptly change to over-pessimism, and the endurance of the Germans, long accustomed to a desperate outlook, will then be able to outlast that of the disappointed British whose hopes are already descending from their peak.

## RETREAT IN THE EAST

German military critics, particularly Captain Ritter von Schramm, now write that unquestionably the west front will play a decisive part in the final phase of the war. Their fondest hope appears to be that this western phase will not begin too soon, or before some sort of permanent stability is established on the Russian front. To achieve this stability the German High Command have made a number of noteworthy dispositions recently. Until July the main German strategic reserves were stationed in Prussia, Saxony, and Thuringia. Now the greater part of these have been moved to Poland. Escaped Poles arriving in Stockholm say that at the end of October the Germans had in the Radom district alone some 80,000 troops, or eight divisions. (The German division, for various reasons, has been numerically reduced since the beginning of the war, and now averages about 10,000.) Taking Radom as an average the General Government now has some 30 German divisions and the whole of Poland about 60.

\*Reprinted from the London Times.

## NARVA-ODESSA LINE

Owing to active local opposition Poland has always required the presence of large German garrisons; but the present number far exceeds requirements for the war against the organized underground movement and is intended, it is believed, as a strategic reserve to stabilize the Russian front on a Narva-Odessa or Riga-Odessa line. The latest information shows that the German High Command hope that the Narva-Odessa line can be maintained, as a withdrawal to Riga would sever Germany's contact with Finland and jeopardize sea transport to her troops there and her ore traffic with Sweden, besides being a possible inducement to Finland to withdraw from the war and making the defense of the whole northern part of the fortress of Europe more difficult.

The Germans show a certain lack of confidence in their ability to stabilize their front on a Narva-Odessa line and are consequently uneasy about the northern wall of the fortress. Indeed, what looks like a German feeler has been reported in Sweden recently. It includes the suggestion that the Germans might voluntarily leave the northern half and perhaps the whole of Norway if they were assured that the British and Americans would not occupy it. Within the past two months the Germans are reported to have withdrawn two divisions of Austrian Alpine troops from Finland, presumably for transfer to the Balkans. Until recently none but first-class troops were stationed in Norway; but constant changing has resulted in a distinct deterioration in quality if not in quantity. A large number of aircraft has also been withdrawn, but the ground staffs remain so that the position can be quickly restored if necessary. The troops now in Norway are mostly very old.

Denmark is at present one of the scenes of greatest military activity along the coastline of the European fortress. Since the summer fortification work has been proceeding on a great scale and at high pressure, more especially in Jutland, but also in Zealand. Not merely is the coastal strip being fortified, but a zone reaching far inland, with various tank traps and barriers, even in towns near the coast.

Two or three months ago Denmark had three or four German divisions—at the most 60,000 men. But that number has now approximately doubled. As in Norway, the quality of these troops is mixed; their uniforms are shabby and patched, and their morale is low, though not broken. The soldiers show a remarkable willingness to trade their arms for butter or butter coupons, especially soldiers going to Germany on leave. German aircraft in Denmark are at present less numerous than formerly. A large proportion are of old types, and accidents are frequent as personnel seems to lack training and experience.

Work on fortifications continues actively also in Holland and Belgium, though there it is more advanced than in Denmark, having been begun much earlier. A large part of this work is done by the Todt organization, but some is entrusted to contracting firms employing local and imported labor. Beaches are elaborately mined, and in some areas resemble underground warrens. At Ostend, for instance, where hotels line the coast, the Germans have linked all the hotel cellars, thereby making something like subterranean streets. Invasion barges which remained in Hol-

land and Belgium after the Battle of Britain and later were moved, presumably for safety from British bombs, to the Baltic have now been taken to Finnish harbors—also perhaps for safety, but they might serve as evacuation craft if the Germans decided to quit.

## THE HOME FRONT

The walls of the fortress of Europe are thick and strong apparently everywhere; but, says Ritter von Schramm, the military writer, the German Command does not depend entirely on any Maginot system. Germany has other defensive resources. It is no secret, he says, that the German western armies have been systematically permeated with veterans of the Russian front, and ultimately the quality of the men counts more than any other factor. He naturally does not mention that such veterans are not sufficient to go around the whole fortress, especially as a large proportion of them is still needed in Russia. The fact is that the men manning the fortress walls are of mixed quality and are constantly being changed.

The garrison of the fortress today includes, however, not only the uniformed armed on the outer walls but over 100,000,000 persons variously employed inside the fortress, and these are the greatest anxiety of the German leaders. The millions of France, Belgium, Holland, Denmark, and Norway are burning with hate and latent activity against the armed defenders of the wall. Some 10,000,000 or 12,000,000 foreign laborers, scarcely less vengeful, are employed under compulsion inside Germany.

## GERMANS LOOKING AHEAD

The latest—and certainly trustworthy—reports reveal that the mass of the German public is apathetic, believing nothing either from their own or enemy sources, interested in nothing, hoping nothing, but just plodding on as it were by inertia.

There is a passive, dull hopelessness; but not even the rudiments of any organized active resistance exist—nor apparently is there any wish for it. It would be futile to promise the Germans any degree of happiness or the blessings of democracy after the war. They simply would not believe that defeat would bring them happiness, and they have no desire for democracy anyway. Tell them, said one well informed student of the German mentality with facilities for gauging the present temper or temperless apathy, that the overthrow of Nazism will bring them a little relief, that life will continue to be hard, with laborious tasks for years ahead, but anyway somewhat, perhaps 10 per cent. less hard than at present, and strictly governed by stern justice, and then you will have the Germans listening. My informant added that this hopeless attitude—though less apathetic because the men have arms—is certainly present in some degree inside the army.

In spite of all this, it is useless to expect any sort of spontaneous revolt of the Germans. There is a core of perhaps 1,000,000 men, including Himmler and his Gestapo, who have charge of the armed forces and all the arms and munition depots, and will fight like rats in a trap, knowing full well that there is no way for them to work their passage home. While the grip of these men lasts the mass cannot revolt.

# The Attack Team Strikes

By Captain Frank Menacker, Coast Artillery Corps

A subject of training at the Antiaircraft Artillery Training Center, Fort Bliss, Texas, has been a strenuous course in physical hardening. Although this produced rugged individuals they still lacked training in the realism of battle. This phase of training was instituted in October of 1942 to develop psychological stamina in all individuals.

The need of this training in mental as well as physical endurance is well illustrated in the following example. One night, when a convoy started out on a mission, several members of the Physical Training Section armed themselves with a can of HC smoke, rifles and blank ammunition, and several sticks of dynamite, and intercepted the convoy at a given spot on the highway, which it was approaching under blackout conditions. Unexpectedly, it was met by the terrific blasts of dynamite, followed by smoke and rifle shots. The entire convoy was thrown into a panic. Confusion reigned as the drivers forgot their proper distances and jammed up the trucks. Men ran about excitedly, wondering what to do. Some thought that they were actually under enemy attack. It was a half hour before they could get under way again.

This incident led to the organization of an attack team under the direction of the Physical Training Section of S-3. This team was soon able to capture whole battalions and wipe out gun positions with ease.

Before long, the units in the field began to sit up and take notice. They were not able to accomplish their missions and, furthermore, they were suffering embarrassment in being captured by a mere handful of men. Interest and alertness were thus engendered and units began to train in local security, individual defense measures and defense against chemical attack. As a result, the attack team now experiences great difficulty in trying to capture any outfit. As a matter of fact the team is captured more times than not. However, the team has been doing a painstaking and beneficial job in bringing home the lessons of realism in the training center to serve them well on the battlefield.

At present, the attack team operates both day and night. For daylight attacks four M3A1 tanks are used. Units in the field are required to lay mines and construct tank obstacles. The team may decide to attack at night, or more often, at some early morning hour when a white-shirted (the white shirt is used to designate the commando as an enemy), dirty-faced figure will creep into the battalion commander's tent or dugout and make an important capture. Or, some other "enemy" may attempt to disrupt the entire problem at hand by capturing the radio and issuing false messages throughout the entire battalion.

Let's spend a day and night with these "Commandos" and see what their life is. At 1400 they meet at their headquarters and prepare to go on a tank attack. Every man checks his gear and climbs into his tank. The caliber .30 machine guns have plenty of blank ammunition. A demolition squad whose specialty is dynamite, gas and smoke is present. Definite orders are issued and each tank commander is assigned a task. A definite plan of attack has

been prepared but if something should go wrong, each man will rely on his own initiative as the mission MUST be accomplished, regardless of cost.

At 1430 the team rumbles away and is soon skimming across the desert at 30 m.p.h., approaching the objective, a brigade headquarters. Brigade spots the attackers in the distance but before they can set their defense plan in motion they are suddenly covered by a thick blanket of smoke. The demolition squad has slipped in ahead, unseen, and set it off. While the smoke covers the area the tanks slip in and commence firing. In the meanwhile, the dynamite charges go off at intermittent intervals. As the smoke clears the team rides roughshod through the area, completely "destroying" the position and killing all personnel.

This mission accomplished, the team heads for a group headquarters some distance away. It approaches the position and waits for the usual smoke screen. It is not there. The demolition squad has been captured by the alert outposts and sentries. The signal to attack is given. The team approaches the position, deploys and heads for the heart of the CP. Two loud explosions are heard. Two of the tanks have struck hidden land mines and are "put out of action." They have stopped and are being bombarded with "Molotov Cocktails" and hand grenades.

Another tank drives over a concealed fox hole from which a figure pops out and hurls a "Molotov Cocktail," making a direct hit. The last tank, all guns blazing, realizes the case is hopeless as the personnel of the group are well dispersed. Retreat is indicated but it is too late. Word of the attack has reached an AW battery. It has blocked every avenue of escape, covering each with a gun.

At midnight the team, forty strong, with blackened faces, meets in a darkened room, lighted only by a candle over a spread out map. They are all ready for action. The demolition squad is ready and supplied. Orders are issued. Jeeps are mounted and they start for their objective, an AW battalion headquarters. About a mile from the position the team dismounts and forges ahead on foot. It is suddenly halted by a sentry who steps out from behind a bondock. This is a fatal mistake for him to make as he is clearly silhouetted. One of the attack team slips up behind him and he is out of action. Crawling ahead, the Battalion CP is finally sighted. The demolition squad goes into immediate action. There's the gas alarm! Everyone is awakened and heads for his battle station. If he exposes his position, he is shot. Here comes a thick blanket of smoke and the team starts infiltrating: What a din as the dynamite keeps crashing through! When the smoke clears, most of the team is at the CP. Much equipment has been destroyed and the officers and men have been "killed." Of course, the team has suffered a few casualties, too.

This unit will never again make the mistake of having an incompetent sentry. It knows now that it needs a system of outposts which will not try to stop the attackers but will allow them to slip through while notifying the CP so that every man in the Battalion will be on the alert.

# Graphical Analysis for AW Fire

By Lieutenant Colonel Bradley M. Cooper, Coast Artillery Corps

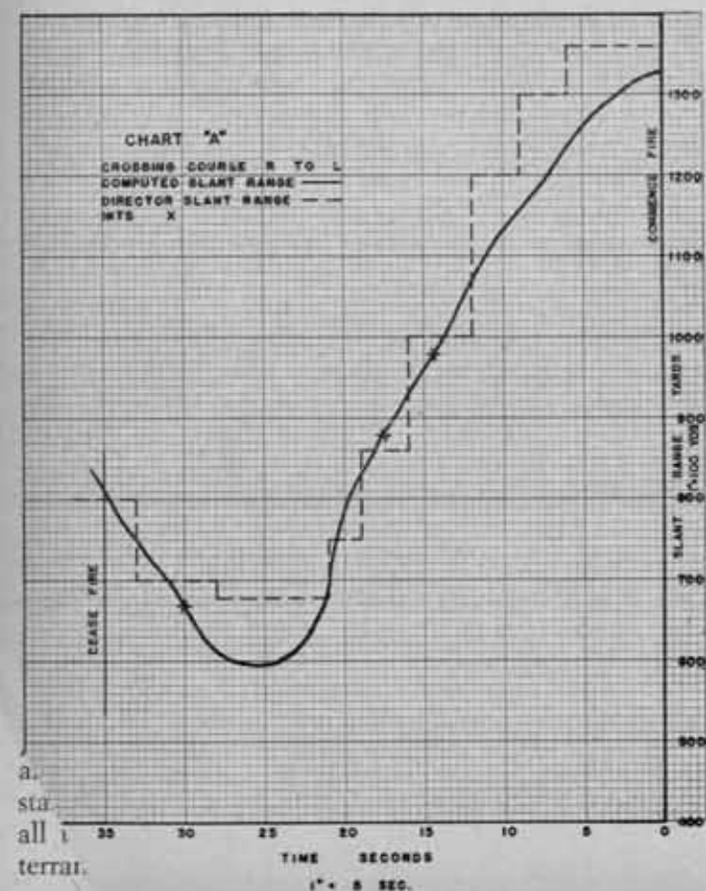
The purpose of this graphical analysis is to give the Battery Commander a chart showing exactly what his range section did during target practice. It is a graphical picture of each course. Without some record of this nature it is impossible to determine why hits were not obtained. It shows the slant range to the target, the ranges set into the director, and the hits as they occurred. It has proved invaluable at critiques to point out errors in the operation of the equipment.

The method used to obtain the data is simple. The equipment required is readily available to most AW units. These charts may be drawn on a blackboard after each course of the target at the firing point. These charts may then be studied after the firing has ceased. The Battery Commander may then correct errors made by the range section immediately and not several hours later when the range section has forgotten the conditions that existed during the target practice.

## GRAPHICAL ANALYSIS CHARTS

Charts A, B and C are copies of charts prepared on an AW battery target practice. This battery was equipped with 37mm guns and M5 Directors.

Chart "A" shows that the range setter had too much range set in at commence fire and that when he did get sensings of over he did not make a bold enough decrease in range to get a short. At the midpoint he should not have



increased his range until he got a sensing of short. This is, however, an excellent example of the proper method of range adjustment. It resulted in three hits and shows that the range setter knows what he is supposed to do. It shows that he needs more experience in estimating ranges so that his initial range will be just short of target on this type course. Range Data and Hit Data sheets below show how these sheets are marked to plot Chart "A."

Chart "B" shows that the range setter did not adjust the range properly. At no time except at the first part of the course would he have got a hit.

Chart "C" shows that the range setter was not bold enough in decreasing his range. He got two hits but would have had more if he had changed his range sooner after getting sensings of over.

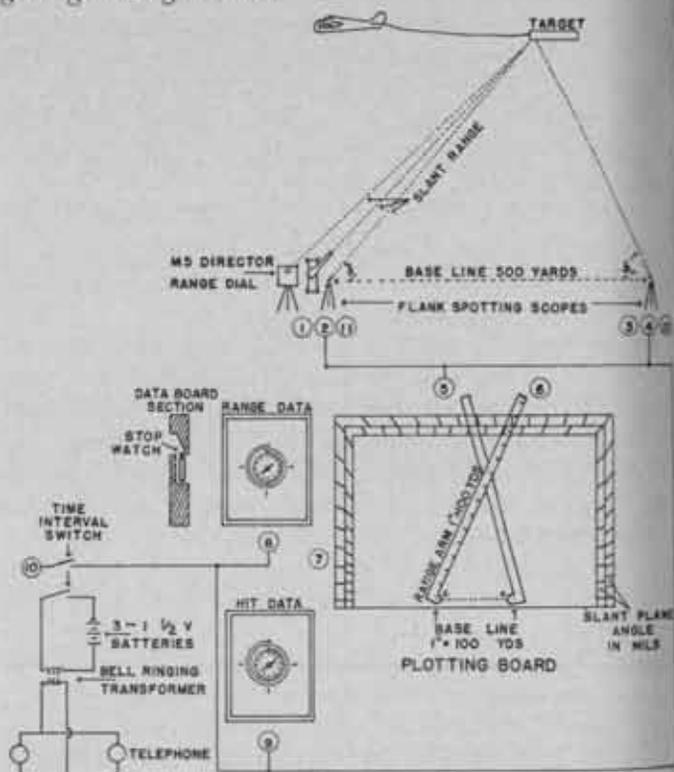


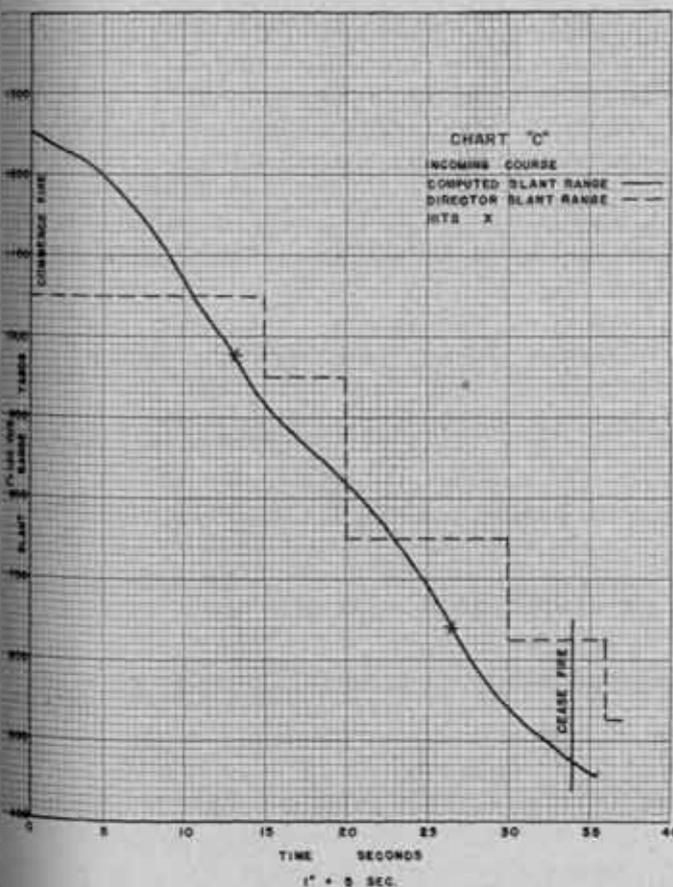
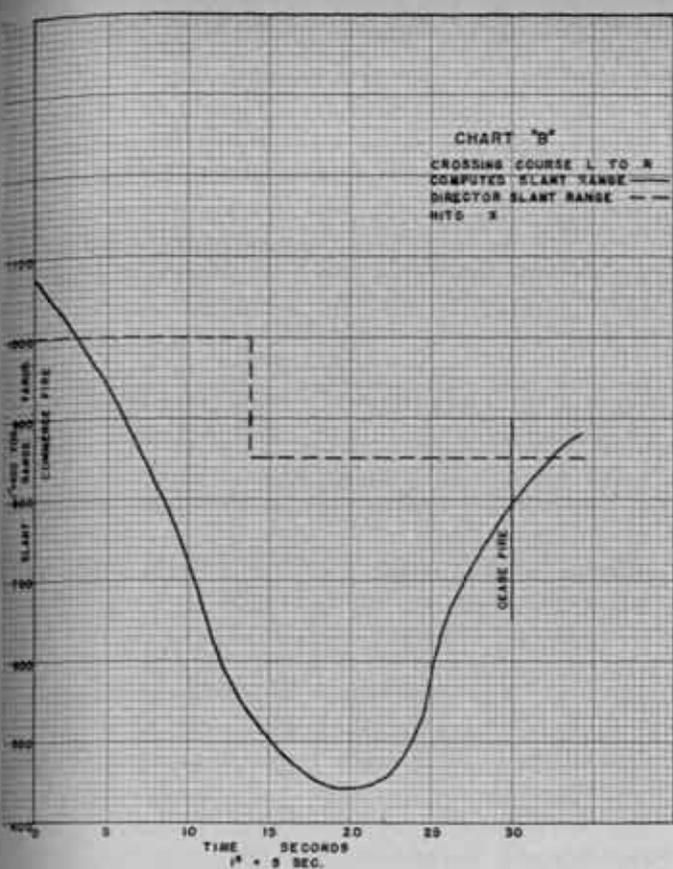
Figure 1

### Personnel:

- (1) & (3) Instrument Observers.
- (2) & (4) Slant Plane Angle Readers.
- (5) & (6) Slant Range Arm Setters.
- (7) Slant Range Reader.
- (8) Director Range Recorder.
- (9) Hit Recorder.
- (10) Timekeeper.
- (11) & (12) Slant Plane Angle Recorder (not required if plotting board is used).

### PROCEDURE

(1) Two flank spotting instruments are set up on a five hundred yard base line. One instrument is placed behind and near the firing unit. The other instrument is placed at the other end of the base line. It will simplify orientation

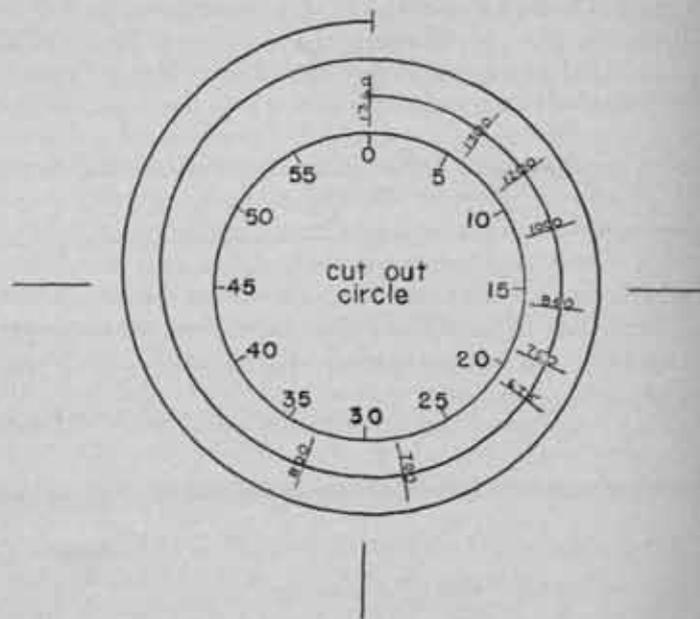


(2) The plotting board is set up in the rear of the firing line and is manned by two Range Arm Setters (5) & (6), and a Slant Range Reader (7). The Slant Range Reader (7) reads and records the slant range at the intersection of the two slant range arms for each point plotted.

(3) The Director Range Recorder (8) equipped with a range data board will stand behind the M5 Director so that he can record the range set into the Director by the Range Setter. He will wear a headset connected to the Timekeeper (10). The range data board has a recess in its center for a stop watch and a hole through the back to allow a finger to enter and touch the stem of the watch. A data sheet with a hole in its center the size of the crystal of the watch is fastened to the front of the board (see figure 2). This data sheet has a spiral line drawn around this hole. The data sheet is placed so that the starting point of the spiral line is directly in line with the zero mark on the watch. The Director Range Recorder (8) will start the stop watch at the command ready, "Take," preceded by "Stand by for time zero." He will stop the watch at the command of "Cease firing." These commands are given by the Timekeeper (10). The Director Range Recorder (8) will record the range set into the Director at time zero on the starting point of the spiral line. He will write the new range set into the Director across the spiral line and opposite the point of the second hand of the stop watch whenever the range is changed by the Range Setter.

RANGE DATA SHEET

Battery & Section \_\_\_\_\_ Range (Location) \_\_\_\_\_  
 Weapon \_\_\_\_\_ Type of Course R TO L \_\_\_\_\_  
 Date & Time \_\_\_\_\_ Number of Course CHART "A" \_\_\_\_\_



NOTES

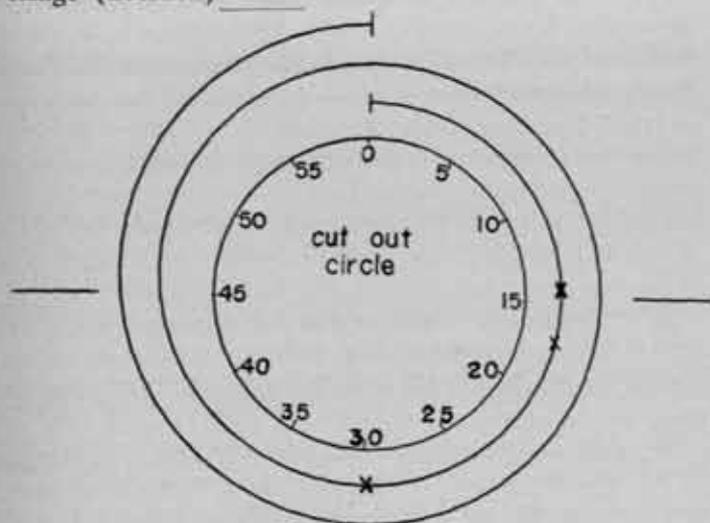
Watch is started at command, "Take," preceded by "Stand by for Time Zero, Ready, TAKE." It is stopped at the command of "Cease Firing." These commands are given by the Chief Time Keeper. The range set into the M5 Director is written on curved line at Time Zero. Changes in range estimation thereafter will be written on the curved line opposite such occurrence.

Figure 2

If these instruments are placed so that they are intervisible, each instrument is manned by an Observer (1) & (3) and Slant Plane Angle Reader (2) & (4). They will read the angle between the base line and the target in the slant plane. No vertical angle is necessary.

## HIT DATA SHEET

Battery & Section \_\_\_\_\_ Type of Course R TO L  
 Weapon \_\_\_\_\_ Number of Course CHART "A"  
 Date & Time \_\_\_\_\_ Number of Rounds 30  
 Range (Location) \_\_\_\_\_



## NOTES

Watch is started at command, "Take," preceded by "Stand by for Time Zero, Ready, TAKE." It is stopped at the command of "Cease Firing." These commands are given by the Chief Time Keeper. A radial line is drawn on curved line at the time of each hit.

Figure 3

(4) The Hit Recorder (9) will be stationed behind the firing line and watch the target on its course. He will have a Hit Data board exactly like the Director Range Recorder (8) and will start and stop his watch in the same manner. The Hit Recorder (9) will mark a cross on the spiral line opposite the point of the second hand of the stop watch whenever he observes the HE burst on the target (see figure 3).

(5) The Timekeeper (10) is stationed near the plotting board. He has a telephone and time interval switch connected into the telephone net. He gives the command "Stand by for time zero, ready, Take" and "Cease firing," and closing the time interval switch on the command "Take" and every five seconds thereafter until the command "Cease firing."

(6) The telephone net is connected as shown in the schematic diagram. All personnel are equipped with headsets and chest sets. This net is used to allow the Timekeeper to give his commands and to transmit the time interval signals. The net is also used by the Slant Plane Angle Reader (4) at the distant instrument to transmit the slant plane angle to the Slant Range Arm Setter (5). The Slant Plane Angle Reader (2) at the instrument near the plotting board will call the slant plane angle to the Slant Range Arm Setter (6).

## COMMENTS

It will be noted that, as the procedure used to prepare these charts is studied, that the time of flight of the projectile will introduce an error in these charts. The slant range to the target is computed for every five seconds. The range changes made by the range setter at the director are recorded as they change. The hits are recorded as they occur. These hits are the result of range settings that were in the director at a time prior to the time the hits occurred equal to the time of flight of the projectile. This error is not important. The charts show that hits occur when ranges are set into the director properly.

From the study of many graphical analysis charts it has been found that range setters tend to underestimate ranges and that hits will occur on courses where the range is overestimated but never when the ranges are underestimated.

The method by which slant ranges are obtained above has been used to train range setters in range estimation. The plotting board and instruments are set up adjacent to an airfield. Slant ranges to airplanes are computed and called to student range setters until they are familiar with ranges to various type targets. The ability of these students to estimate ranges may be checked by recording the slant ranges from the plotting board and comparing this record with slant ranges that the students have written on paper furnished for that purpose. This method of training is valuable in that the range setter is trained to estimate ranges to airplanes. He estimates ranges to a target by its apparent size and shape in space. The panel or flag target does not have the shape or size of an airplane or battle target. This training of range setters is necessary so that the fire of the AW unit may be effective against airplanes.

*While analysis of drill and of target practice are tedious and often monotonous operations they may be made into valuable aids in training, showing up errors and weaknesses in the team.*



"I haven't received my last two JOURNALS," writes Captain X from APO —.

It's not surprising—Captain X never told us he was leaving Camp Davis.

# Fire Adjustment for Rapid-Fire Batteries

By Sergeant Charles Wegener, Coast Artillery

**Editor's Note:** It is believed that the principles involved in this article are being employed in one way or another by firing batteries to maintain a current record of the number of salvos lost after a correction has been ordered.

The complications that may arise from the use of a chart such as described in this article are many. It must be appreciated that in combat both "C" and "K" will be extremely variable, particularly with rapid-fire batteries. The thoughtless use of such a chart is to be guarded against.

A rapid-fire battery, firing at a fast-moving and probably fast-manuevering target, would most likely open fire for effect immediately without waiting for trial salvos. The shortness of the K-factor as compared to the time of flight makes it illogical to take the time to sense a salvo and calculate a correction. A large number of shots might be thrown at the target during this time, and even though their center of impact was not on or even near the target, the resulting volume of fire might score a "lucky" hit or come close enough to divert the target from its mission. Consequently, the most justifiable course for such a battery would be to open fire as soon as an initial correction sufficient to insure reasonable accuracy has been applied.

However, all methods of fire adjustment are based on separate corrections applied on each of several trial salvos until it is clear that the center of impact is approaching the target. Opening fire without such single salvos complicates the problem. A correction can be applied on the sensing of the first salvo as soon as it is received, but several of the following salvos will have been fired on the same correction as this opening salvo, and cannot be considered in applying a new correction. The operator of the fire adjustment board must therefore be furnished with some means of determining how many salvos (sensings) he must allow to pass before the correction he has made will take effect and he can apply another. The number of such salvos will be given by the following formula:

$$S = \frac{TF + C}{K}$$

where 'S' is the number of "dead" salvos, 'TF' the time of flight at the given range, 'C' the correction interval or time required to calculate and apply a correction on the sensing of a salvo,<sup>1</sup> and 'K' the "K-factor" or the interval between salvos.<sup>2</sup> In solving for 'S' its value is taken simply to the whole number, fractional parts being disregarded. Thus if the time of flight is ten seconds, the interval between spotting and application of correction on the gun is seven seconds and the value of 'K' is five seconds, the number of salvos which will be fired on the old correction will

<sup>1</sup>'C' is somewhat analogous to dead time, but is the interval between spotting and firing, rather than observation and firing.

<sup>2</sup>This formula assumes that the value of 'K'—the interval between salvos—is equal to the interval between salvos. If the guns are not firing together and one is faster than another, the lowest expected value of 'K' should be taken.

be three. In a two-gun battery this would mean that six sensings must be allowed to pass before sensings on which to base a new correction will be received. To take an example, let us assume a two-gun battery using a fork of 2.4%. The salvos are sensed as follows and corrections made as indicated.

1. SS—plus 2.4% or 324 (reference numbers)
2. SS
3. SS } "dead"
4. SS }
5. SS—plus 2.4% or 348 (reference numbers)
6. SS
7. SS } "dead"
8. SS }
9. OS—no correction: this salvo and the following ones are plotted and corrections made as indicated on the adjustment chart after eight (8) to twelve (12) shots
10. OH  
etc.

For lateral adjustment of fire these rules will vary with the exact method used. Ordinarily it would not be necessary or advisable to apply a correction on the spotting of the opening salvo alone unless it is obvious that all the guns of the battery are a considerable distance off the target. However, whatever the number of shots plotted before making an adjustment, the general principle which determines the number of sensings which must be counted as "dead" before a correction takes effect will still be stated by the formula, though 'C' may vary.

Those responsible for lateral and range adjustment must therefore be furnished with a table giving the value of 'S' for each zone of ranges in which it remains unchanged. In any specific case he can refer to the percentage-corrector for the corrected range, consult his table and apply corrections accordingly. In computing the value of 'S' it is desirable to include a "safety" factor which may lose an extra salvo now and then but which will assure that no correction is made on a sensing which was not affected by the previous correction. There are three ways of doing this. The value of 'C' may be increased beyond the normal time experienced in drill on the assumption that combat conditions would tend to slow the process down, or the value of 'K' may be taken as the same or even less than drill or target-practice time on the theory that the guns will fire more slowly under combat conditions. This will have the same effect as increasing the value of 'C' since the faster the guns fire, the greater the number of salvos they will fire during the time of flight and application of a correction. Both of these may be taken together or the values may be taken literally and an extra salvo arbitrarily added. The value of 'S' will then be:

$$S = \frac{TF + C}{K} + 1$$

# Training Aid for 155mm Batteries

By Captain U. S. Jones, Lieutenant J. M. Jarvis, and  
Lieutenant M. E. Bishop, Coast Artillery Corps

The latest invention of a Coast Artillery (SC) battery now stationed in the Caribbean Area, is an adapter to permit firing the .50 caliber water-cooled machine gun as sub-caliber to the 155mm gun. More firing is possible as allowances of .50 caliber ammunition are much greater than either 37mm or 155mm ammunition. The firing has been beneficial to both morale and training. It is particularly valuable practice for gun pointers and spotters.

One very successful practice session was held on July 23, 1943. More than a dozen problems were fired at ranges varying from 2900 yards to 5100 yards. Of the 183 rounds fired, ninety seven shots or more than 50% landed within thirty yards of the target. Excellent spotting was obtained even though the splash and the target, a 50-gallon drum, were both small. Only seven shots of the 183 were lost by the spotters and less than ten per cent were incorrectly called, in spite of the white caps in the water area. Practically everyone on the gun crews had a chance to fire a few shots either as gun pointer or elevation setter. The whole battery had a good time at the shooting and the great accuracy gave both the range section and the gun crews added confidence in their ability to hit any assigned target.

The 37mm sub-caliber mount M1 is easily changed to accommodate the .50 caliber water-cooled machine gun, Browning, M2. The enclosed drawings and photographs show the details of the modification. The adapter consists of two brass trunnion sleeve bushings and two brass trunnion covers. These bushings fit into the trunnion supports of the 37mm sub-caliber mount and are held in place by the trunnion covers. The trunnions of the machine gun are not used. The machine gun is supported by a bolt through the hole in the lower forward part of the receiver. The ends of the bolt bear in the brass trunnion sleeves. A

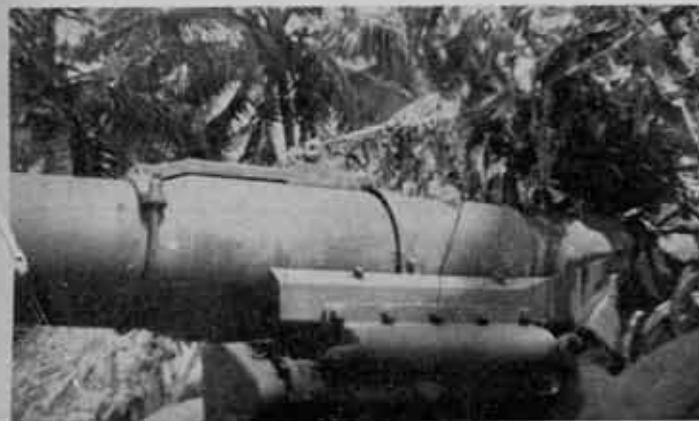


The .50 in place.

small portion of the frame of the sub-caliber mount is cut away to accommodate the water jacket on the machine gun.

A short  $\frac{3}{4}$ " rod is fastened to the rear of the sub-caliber mount and, by means of a short length of pipe brazed at right angles to the rod, is bolted between the lugs protruding from the bottom edge of the receiver group of the machine gun. This rod firmly anchors the gun and permits of some adjustment in elevation. The machine gun is oriented in azimuth by boresighting the 155mm gun on a distant object and then aligning the machine gun sight on the same point. The elevation of the machine gun barrel is measured by opening the cover plate and placing a gunner's quadrant on the top of the bolt assembly. As the machine gun is loaded and fired one shot at a time, the magazine is not needed.

The firing data for the machine gun was worked out by the battery officers. The machine gun was mounted so that it was at 11 mils elevation when the 155mm gun was at zero elevation. This added elevation plus the height of site of 175 feet enabled us to reach the minimum range of 2000 yards to the water area with the elevation of the 155mm gun set at zero. The preliminary data was obtained by firing four shots at zero elevation, four shots at 5 mils elevation and four shots at each 5 mils increase in elevation up to 75 mils. The splashes were spotted at the base-end stations and the distance to the splash obtained from the plotting board. The center of impact of each four shots fired at the same elevation was computed and plotted on a graph with a horizontal scale of 100 yards to the inch, and a vertical scale of 10 mils to the inch. After all the centers of impact were plotted, a smooth line striking an average between all the plotted points was drawn. This line was used as the true range-elevation relation for the machine gun. The



The adapter.

Subsequent firings proved it to be accurate. A logarithmic tape with a scale of one log unit equaling 200 inches was prepared and placed in the percentage corrector. The elevations on the tape were drawn in to be the elevations at which to lay the 155mm gun to get the indicated range from the machine gun. A bracketing adjustment chart was prepared in the regular manner using the formula  $C \text{ equals } \frac{S - O}{2(S \text{ plus } O)}$ .

F. The probable error of the gun was computed by averaging the individual deviations of each shot in a group of four from the center of impact of that group. This figure was expressed in terms of per cent of range and a grand average of the per cent of range deviation for each group of four shots was used as the gun's probable error. With the bracketing adjustment chart and the per-

centage corrector, the plotting room was prepared for Case II firing.

The adjustment of the deflection on the M8 panoramic sight was accomplished directly from the battery commander's post by means of a 1910 azimuth instrument and a special slide rule to convert the 3 normal of the azimuth instrument to the 10 normal of the M8 sight. The deflection settings were telephoned directly to the gun pointers.

This use of a .50 caliber machine gun has proved to be one of the most effective and popular training aids ever used by this battery. It arose from an experiment started by Captain U. S. Jones, in March, 1943. The details of the modification of the 37mm sub-caliber mount were worked out by T/Sgt. W. F. Lackey, artillery mechanic, and T/Cpl. J. M. Seay, plotter.



## ROTC Medal Winners

Each year the United States Coast Artillery Association gives a medal to the outstanding student in each Coast Artillery senior ROTC unit. The medal is awarded by the Association on the recommendation of a board of three members appointed by the P.M.S.&T. of the institution concerned.

The selection is made on a grading scale of one hundred points. Grades in academic subjects exclusive of military subjects carry a weight of thirty points; grades in military subjects, both theoretical and practical, rate forty points; personal qualifications, including character, initiative, force, leadership, coöperation, loyalty, industry, military bearing and neatness, count thirty points.

The award is made to a student who has completed his junior year, and is based on three years of military and academic work.

Awards for the academic year 1942-43 were made as follows:

*University of Alabama:* Lawrence Drew Redden, First Street, Tallassee, Alabama.

*The Citadel:* Cadet First Sergeant James Marvin Paul, 922 7th Avenue, Wausau, South Carolina.

*Fordham College:* Cadet Major Robert J. Mullens, 1523 7th Street, Brooklyn, New York.

*University of Delaware:* Cadet Arthur Saulsbury Carr, Jr.

*Georgia School of Technology:* Cadet First Sergeant Arthur Chester Skinner, Jr., Jacksonville, Florida.

*University of Illinois:* Cadet Richard L. Diemer, 1742 Humboldt Avenue, Chicago, Illinois.

*University of Kansas:* Cadet Sergeant Harold Keith Alford, 1407 Kentucky Street, Lawrence, Kansas.

*Kansas State College of Agriculture and Applied Science:* Cadet Ned. W. Rokey, Sabetha, Kansas.

*Massachusetts Institute of Technology:* Private Lawrence Earl Nelson, 7419 Hampton Boulevard, Norfolk, Virginia.

*Michigan State College:* James R. Burnett, Dimondale, Michigan.

*University of Minnesota:* Cadet Sergeant Burton L. Elvig.

*Mississippi State College:* Cadet First Sergeant Archie Glenn McKee, 1205 North President Street, Jackson, Mississippi.

*University of New Hampshire:* John Henry Greenaway, Jr., 49 Pleasant Street, Portsmouth, New Hampshire.

*University of San Francisco:* Cadet Colonel John Francis Blake, 50 Santa Clara Avenue, San Francisco, California.

*Agricultural and Mechanical College of Texas:* Cadet First Sergeant John R. Hill, Jr.

*Utah State Agricultural College:* Cadet First Sergeant George H. Bullen.

*Virginia Polytechnic Institute:* Cadet Corporal Robert M. Kilpatrick, 40 Ash Avenue, Newport News, Virginia.

*University of Washington:* Cadet Technical Sergeant Robert F. Mueller.

Several schools made no award due to the dislocation of their ROTC programs by the war program and others have not yet reported. The large majority of the recipients of these latest awards are now serving in the armed forces, a large proportion in the Coast Artillery Corps. Some recipients were already at new stations when the awards were announced.

# Emergency Time Interval Device

By Lieutenant Robert J. Barnard, Coast Artillery Corps

One of the problems often confronting a commander overseas, when he is establishing a battery of seacoast guns, is that of a Time-Interval system. This is especially true when he is emplacing or taking over emplaced Naval armament, with which T-I systems are not usually found.

In one remote battery, where materials were very scarce and tools almost non-existent, the T-I problem was successfully solved by Corporal Leonard Watkins in three days of after-hours tinkering. With such materials as camouflage wire, packing crates, cigarette tins and adhesive tape; with such tools as a pocket knife, hammer and a dull saw, Corporal Watkins constructed an automatic Time-Interval device accurate to a fraction of a second and capable of several hours of continuous operation.

The device is, in fact, a simplified clock, using a weight for power, and as in all clocks, an escapement for controlling the power.

From the diagram it may be seen that the heart of the device is a cogged wheel on which the escapement acts. This wheel is turned, through a series of pulleys, by gravitational force acting on a weight suspended from a cable,

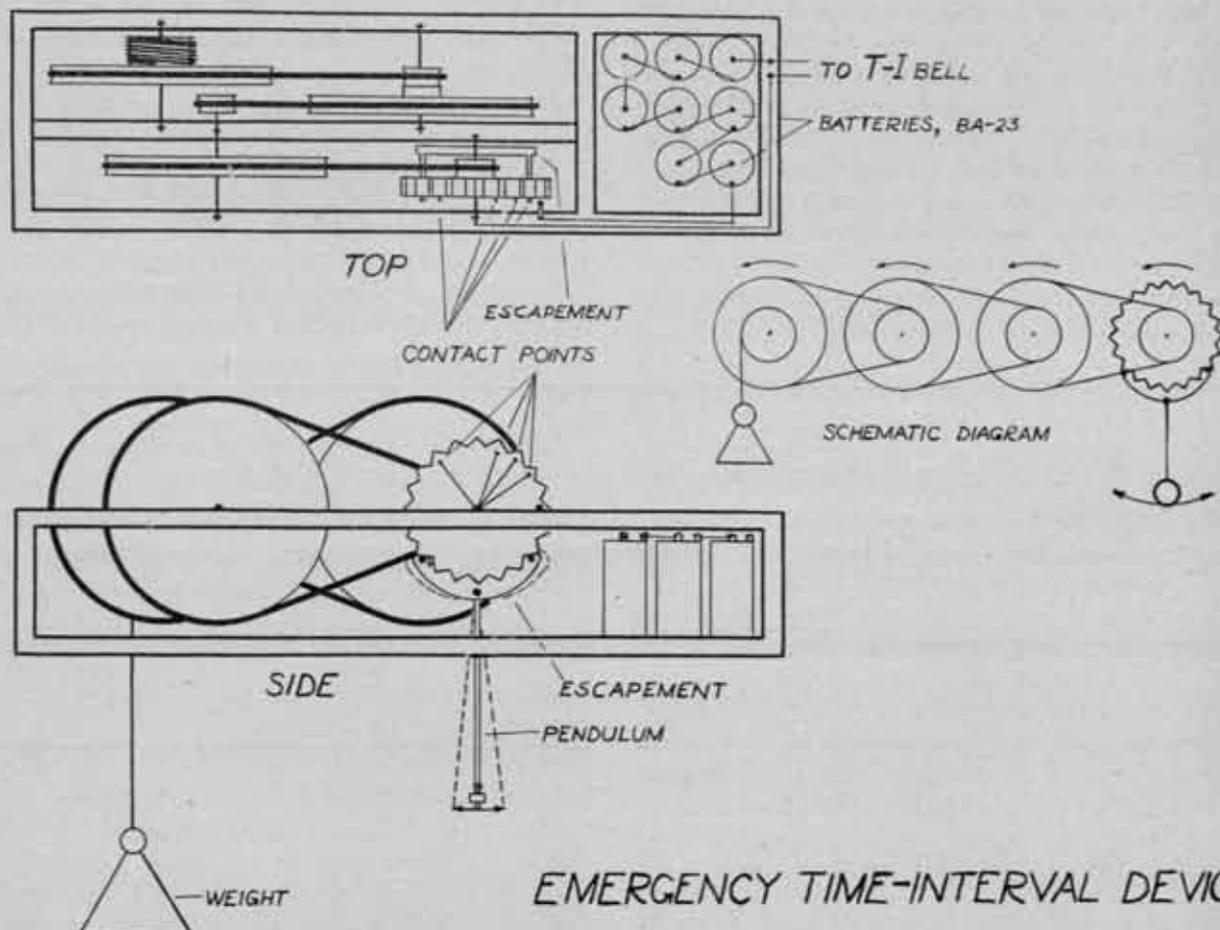
the other end of which is wound about a drum on one of the pulleys.

The escapement in principle consists of two teeth set on the ends of a rocker arm so that in the movement of the arm they will alternately engage the cogs of the wheel and stop its rotation momentarily.

Affixed to the escapement arm at its pivot point is a pendulum. The length of this pendulum determines the rate at which the escapement arm can rock, thereby controlling the speed of the rotation of the geared wheel. The longer the pendulum, the slower will be its oscillation. For easier adjustment, if the lower end of the pendulum is threaded a nut may be screwed on it and control of the movement to a fraction of a second is obtained.

For a twenty second interval, a wheel with twenty cogs was made. Taking an arbitrary cog as number one, a contact point was placed at the fifteenth cog, three more points at the eighteenth, nineteenth and twentieth cogs respectively. These points were connected to the axle of the wheel which in turn was wired to the T-I bell.

Another point was so placed on the frame adjacent to



the wheel as to cause the points on the wheel to strike it successively in each revolution, closing an electrical circuit between the batteries and the T-I bell. Thus if the cogged wheel rotates at the rate of one revolution per twenty seconds, a five second warning bell is sounded, followed by three more bells, the last of which is the firing or observing bell.

In order to transmit the sound of the bell to the various components of the battery, it was superimposed on tactical times already in existence. For each telephone circuit requiring the bell, a headset or handset was extended from the nearest telephone of that circuit and placed a few inches from the bell. An experiment showed that with this arrangement the sounds of the bell were easily heard in a Harbor Defense Command Post after passing through three switchboards and thirty miles of field wire.

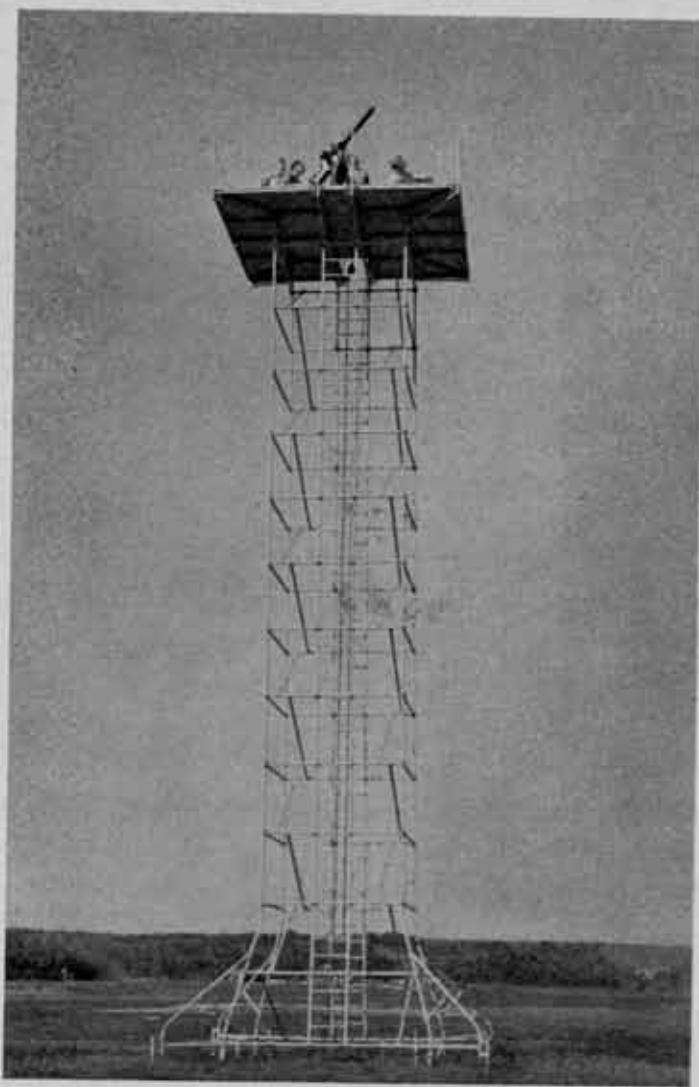
From the diagram it will be noted that no dimensions are given. These were purposely omitted since the size of

any part depends largely on the materials readily available.

The ratio of the pulleys should be about six to one. If it is less, the weight will descend so rapidly as to make constant rewinding of the cable necessary. If it is greater, the loss in power will be too great. With the number and arrangement of the pulleys as diagrammed, the weight descends approximately one foot per hour.

The pulleys were constructed from one-inch scrap lumber and the belts from some old rubber insulation the ends of which were sewn together. A double layer of adhesive tape also makes a good belt material. Camouflage wire may be used for the axles, for the escapement and any other place to hold the device together if nails are not available.

All in all, the device looks like hell and clutters up the appearance of any well laid out plotting room. It has but one redeeming feature, it works, and is a lot more dependable than a man beating out twenty second tempo on a piece of scrap iron with a hammer and a stop watch.



Official U. S. Navy Photo.

"Hasty erection tower," seventy-five feet high, supports a .50 caliber AA machine gun in demonstration at Quantico Marine Air Station.

# Blinker Spotting System

By Lieutenant Wallace A. Hopkins, Coast Artillery Corps

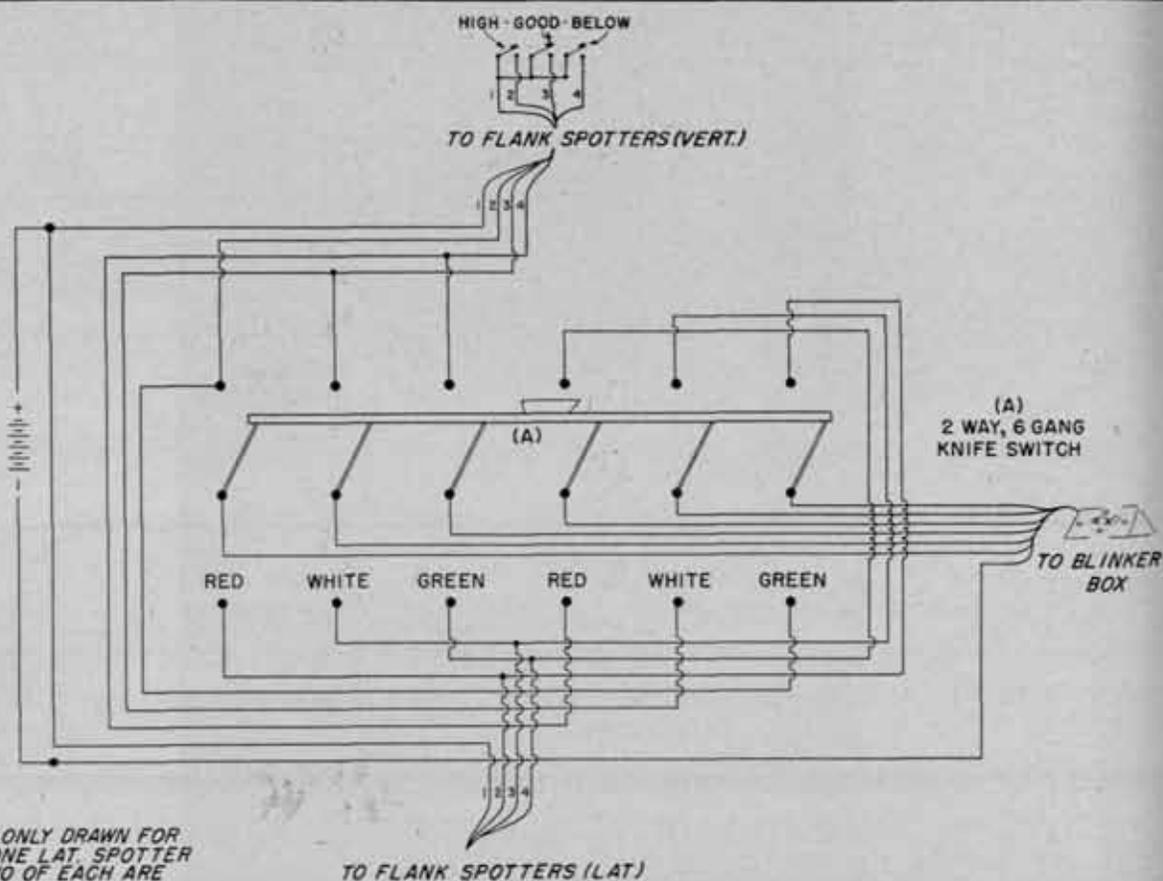
When two .50 caliber machine guns were added to the 37mm AA mount, the continuity of sound during firing made it almost impossible to hear sensings on the field telephone at the central control box when the normal spotting methods were used. Sergeant Joseph H. Zilley, of Battery H, 66th CA(AA), met the challenge by designing an apparatus that transmits sensings visibly instead of audibly.

The device (see picture) consists of four spotting boards (one for each of the flank spotters) on which were mounted three push buttons and a small electric bulb; a switch box, consisting of a multiple-pole, double-throw switch and batteries; an indicator box, containing two banks of indicating lights, visible to the lateral and vertical adjusters on the control box; and a wiring system which connects the spotting boards to the switch box.

During operation, a flank spotter presses the appropriate button on his board at approximate one-second intervals, causing flashes on the corresponding light in the indicator

box. The right bank of three lights is observed by the lateral adjuster. Red signifies "Ahead," green "Behind," and white, "Good." The left bank is observed by the vertical adjuster. Red signifies "Above," green "Behind," and white "Good."

The master switch is used to distribute sensings to the proper indicator bank. For instance, during a course coming from the north, the master switch would be thrown to the right. This would send spots from the north spotter to the right-hand bank for observation by the lateral adjuster, spots from the east and west spotter to the left-hand bank for observation by the vertical spotter. At the same time, the small electric bulbs on East's and West's boards are illuminated indicating that they should send in vertical sensings, while the bulb on North's board is unlit, indicating that he should sense laterally. Sensing is done with the same three push-buttons in either case. The buttons are painted with the same colors as their indicator lights, and



NOTE: PLANS ONLY DRAWN FOR ONE VERT & ONE LAT. SPOTTER ALTHOUGH TWO OF EACH ARE USED.

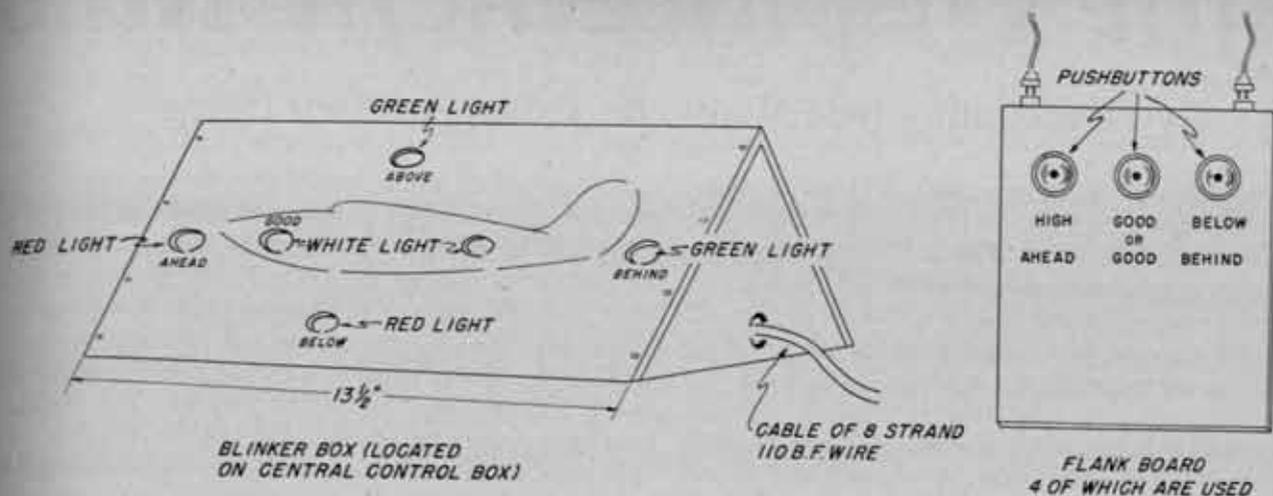
TO FLANK SPOTTERS (LAT)



ANTI-AIRCRAFT DEFENSE  
BLINKER SYSTEM FOR CENTRAL TRACER CONTROL

DATE  
SCALE None  
DRAW. NO. 1  
SHEET NO.

DESIGNED BY  
DRAWN BY  
CHECKED BY  
APPR BY



ANTI - AIRCRAFT DEFENSEL	
BLINKER SYSTEM FOR CENTRAL TRACER CONTROL	
DATE	DESIGNED BY
SCALE None	DRAWN BY
DRAW. NO. 2	CHECKED BY
SHEET NO.	APPR. BY

equipped with a simple arrangement of one, two, or three tack heads for easy identification during night firing.

Indicator lights were from the semi-focusing clearance lights used on cargo trucks, and set at the bottom of four-inch tubes, the interiors of which were painted lustreless black. This rendered the lights clearly visible on even the brightest days.

The bill of materials for the Blinker unit includes:

a. Material used in Blinker Box

1. Two truck clearance lenses, clear.
2. Two truck clearance lenses, red.
3. Two truck clearance lenses, green.
4. Twenty-four screw hooks, flat top.
5. Three square feet  $\frac{1}{4}$ " plywood, masonite or fibre board.
6. Eight board feet of dressed lumber.
7. Six bulb sockets, porcelain. (1 $\frac{1}{2}$  volt)
8. Six flashlight bulbs (1 $\frac{1}{2}$  volt)

9. Six flashlight reflectors or equal.
10. Six feet field telephone wire.
11. Screws, paint, glue and nails.

b. Master Switch Unit (2)

1. One 1" x 10" x 12" dressed lumber.
2. One Triple pole, double throw switch.
3. Screws, staples, paint and field wire.

c. Spotters Switch (4)

1. Three doorbell pushbutton switch or equal.
2. One 1" x 6" x 8" dressed lumber.
3. Screws, paint and field wire.

d. Hookup and Power

1. 800 yards field wire.
2. 18 to 20 volts, direct current.

Colonel Charles Thomas-Stahle, Commanding Officer of the local Coast Artillery Command, awarded Sergeant Zilley a citation for designing and constructing the device.



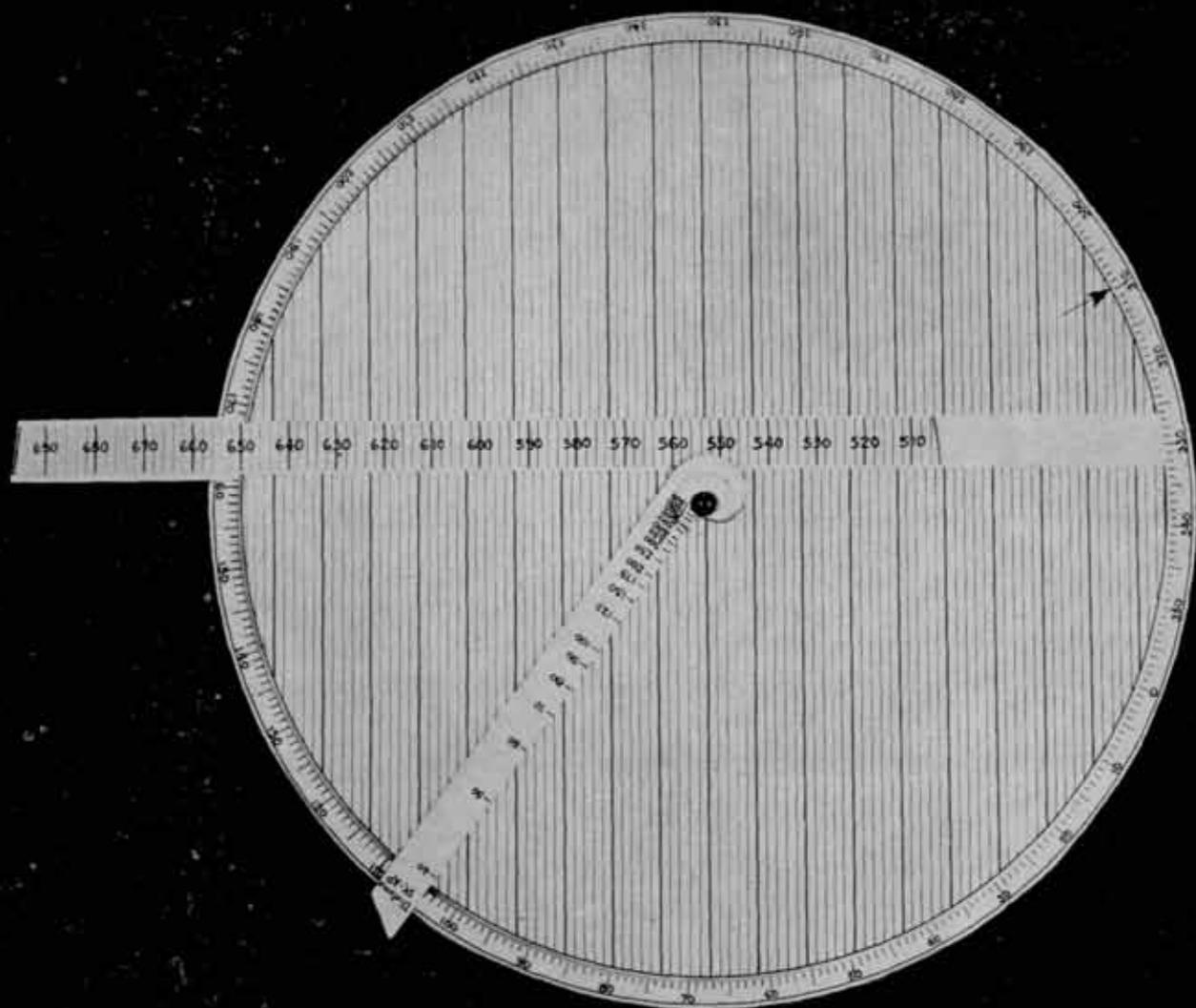
# Sight Displacement Rule

By Lieutenant Clyde W. Beebe, Coast Artillery Corps

Sight displacement is a common cause of errors of pointing in direction in case III firing. Under some conditions it can cause considerable error. The problem applies only to those guns pointed in direction by means of a panoramic telescope and an aiming point. This error can be eliminated at the source by use of the aiming rule, but many Coast Artillery mobile batteries are not equipped with these instruments.

It is not intended in this article to elaborate on the mathematical solution of the sight displacement problem. Basically the error occurs as diagrammed in figure 2. The gun and sight are oriented at G-1 and S-1 respectively. The line of sight is from the sight to the aiming point and there is no error in pointing at the orienting position. It is desired to move the axis of the bore from the orienting position to another azimuth. This involves the turning of the

gun on its pivot (pintle center) by a certain angle. To accomplish this the sight is first pivoted the amount of this angle "A" in the opposite direction. Then, by traversing the gun (on which the sight rides) until the line of sight is again from the sight to the aiming point it is intended to traverse the bore the desired amount. Because the sight is lined on the aiming point in both positions the line of sight in the two positions can not be parallel. This causes an error in transmission of the angle "A" to the bore. The sight stops at S-2 and the gun at G-2. To traverse the gun to G-3, which is the full amount of angle "A," it is necessary to move the sight to S-3. In this position the line of sight would be parallel to the original line of sight. It can be proved that the parallax angle formed by the two converging lines of sight at the aiming point (angle # 1) is equal to the angles labelled # 2 and # 3 in figure 2.



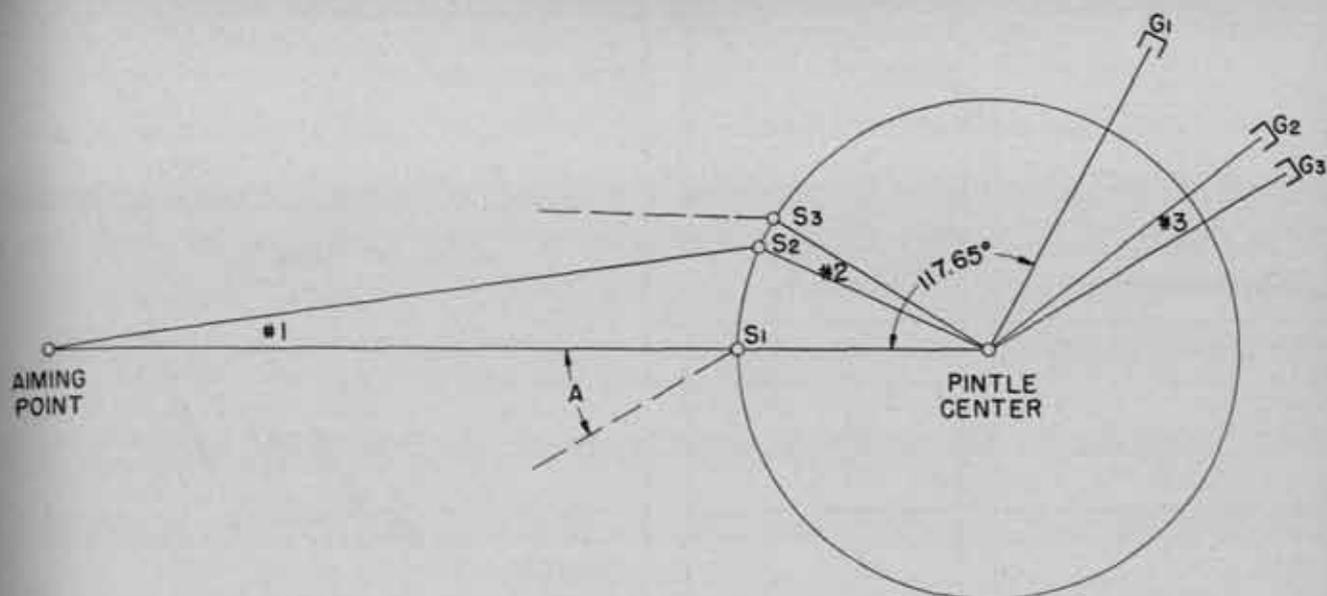


FIG. 2

Angle # 3 is the error in pointing. Thus by determining the amount of angle # 1, the parallax angle, the amount of angular error due to sight displacement is known.

Using the Sight Displacement Rule described here (figure 1) a correction can be quickly computed and applied to the firing data. Construction of the rule is not difficult. It is made for a particular combination of gun and sight, and will function in any location or with any aiming point for this combination. Circumstances that force the battery to fire case III using a nearby aiming point cause the introduction of an appreciable error due to sight displacement. Use of the Sight Displacement Rule permits this error to be equalized in the plotting room without additional personnel. The suggested method of using the rule is to place aiming stakes at the same distance and azimuth from each gun when orienting the battery, these to be used in times of poor visibility. This will make the sight displacement correction the same for all guns, and it can then be applied to the firing data in the plotting room. The change in sight displacement error will be small during any series of shots, and only an initial correction at the beginning of fire should be made, this to be used on all shots of the series.

The rule consists of two disks and an arm, all mounted on the same pivot (figure 3). One disk is covered by a grid of parallel lines, and has a slide working across these lines. The slide is inscribed with the lines, and the labels of the lines. Its function is to permit the labels to be shifted on the grid as required for different situations. The second disk has an azimuth circle around its border and is mounted behind the first disk. It is enough larger than the first disk so the azimuth circle fits at the edge of the grid providing a movable azimuth circle. The arm is mounted on top of the grid and is used to set azimuths. Graduations on the arm indicate different distances from the pintle center of the gun to the aiming point. The rule is oriented for a particular aiming point in two simple operations. Then the arm is set to the firing azimuth, and a correction for error

due to sight displacement, in reference numbers, is read directly from the grid. This correction will be accurate within any reasonable limits.

Three factors must be known in order to construct the Sight Displacement Rule:

1. The distance from the pintle center of the gun to the sight.

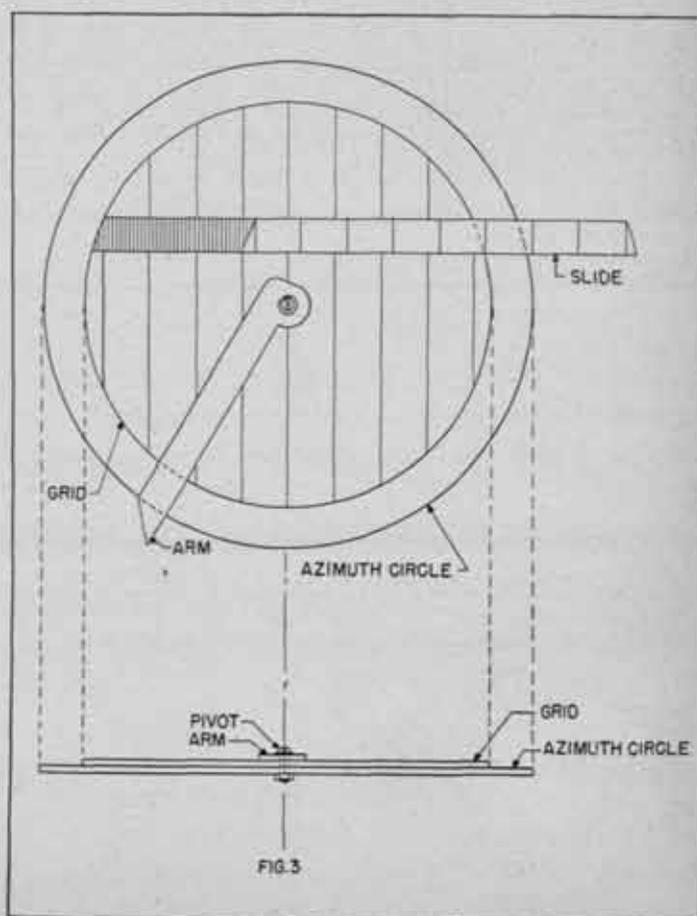


FIG. 3

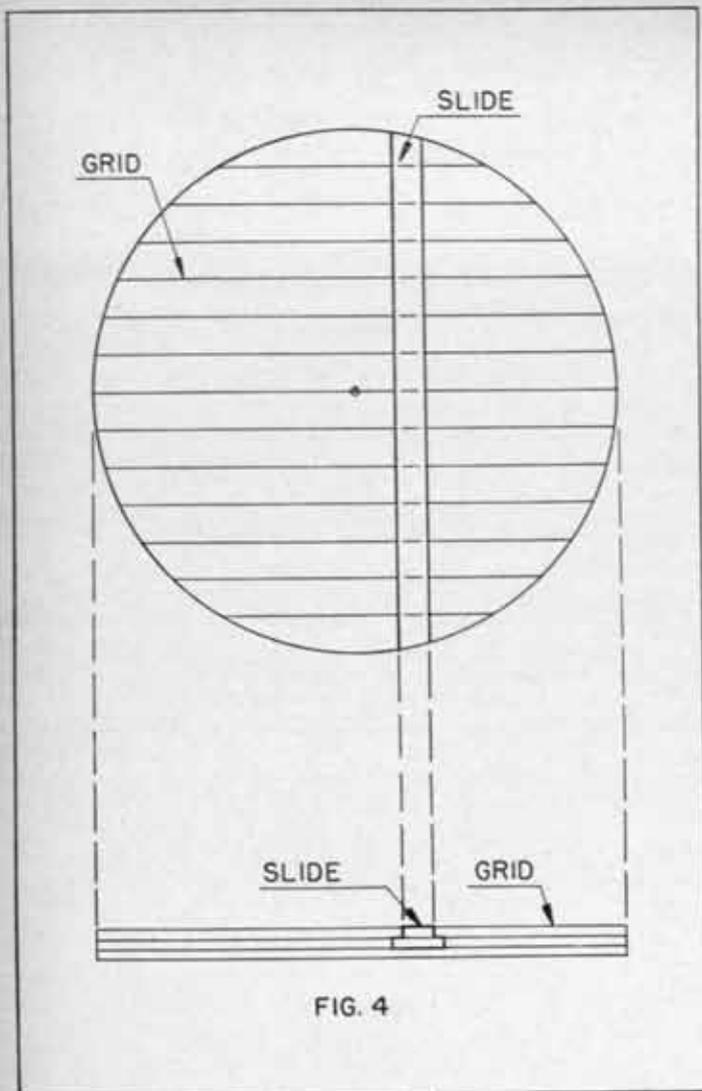


FIG. 4

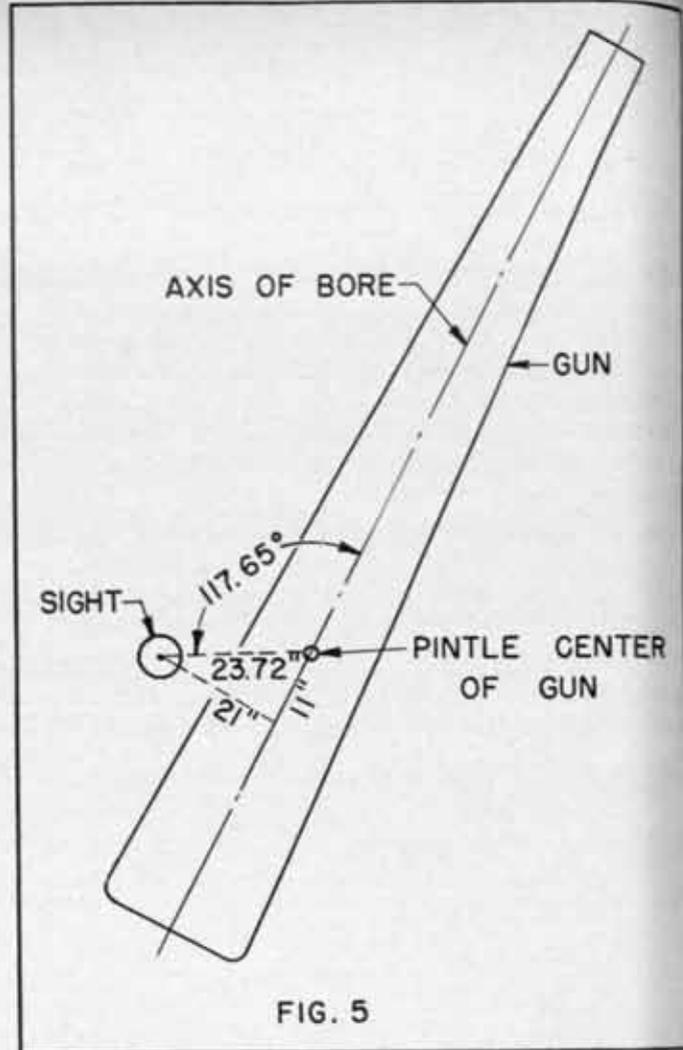


FIG. 5

2. The angle: muzzle-pintle center-sight.
3. The minimum distance from pintle center to aiming point that the rule will be required to accommodate.

Factors No. 1 and 2 are permanent for any combination of

gun and sight. Factor No. 3 is a matter for individual decision. Within the limitations imposed by these factors the rule can be used in all situations.

The rule described here was constructed by laying out the faces of the two disks on drawing paper. Then heavy

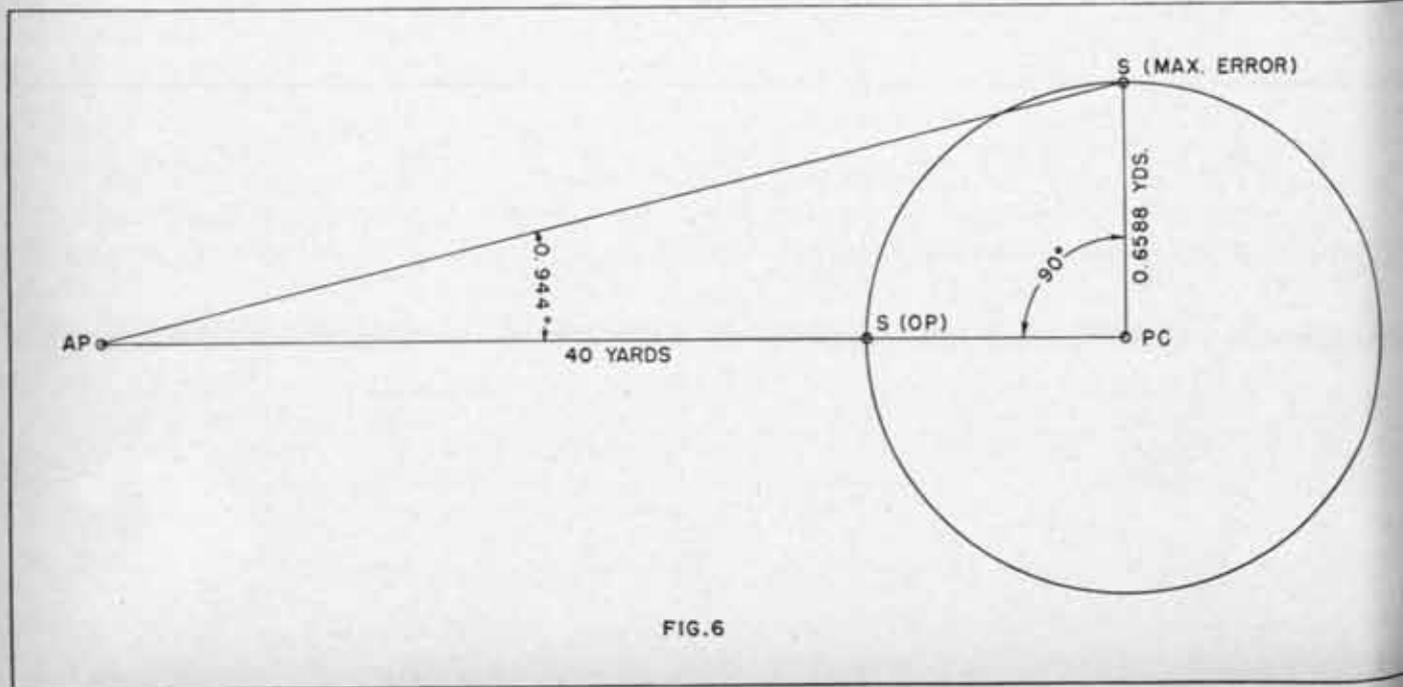


FIG. 6

cardboard disks were prepared and the faces cemented on with paper cement. The azimuth circle is mounted on one cardboard disk. The grid is mounted on the second disk which has been constructed with a slide across it near (but not on) the center of the circle. It may be constructed (figure 4) with three layers of cardboard laminated with paper cement. This rule works well, but for permanent use more durable material should be used to mount the faces.

This rule was designed for use with the 155mm gun M-3, equipped with the M-8 sight. A minimum distance from PC (pintle center) to AP (aiming point) of 40 yards is permitted. Measurements show the horizontal pivot center of the sight to be 11 inches behind and 21 inches to the left of the pintle center of the gun (figure 5). Solution of this triangle proves the angle muzzle-pintle center-sight to be 117.65 degrees. The distance from pintle center to sight is 23.72 inches, or 0.6588 yards. Accuracy of the rule would be little impaired by using less exact measurements, however these need be used only one time.

The next step is to compute the maximum error, in degrees and hundredths, that sight displacement will introduce at the minimum distance PC-AP, in this case 40 yards, providing that the orienting position of the sight is on the line PC-AP (figure 6). Using the relation

$\tan L = \frac{\text{Sight Displacement}}{\text{Dist. PC-AP}}$  this angular error can be found. Substituting in the formula:

$$\tan L = \frac{0.6588}{40.0}$$

$$\text{Angle} = 0.944^\circ$$

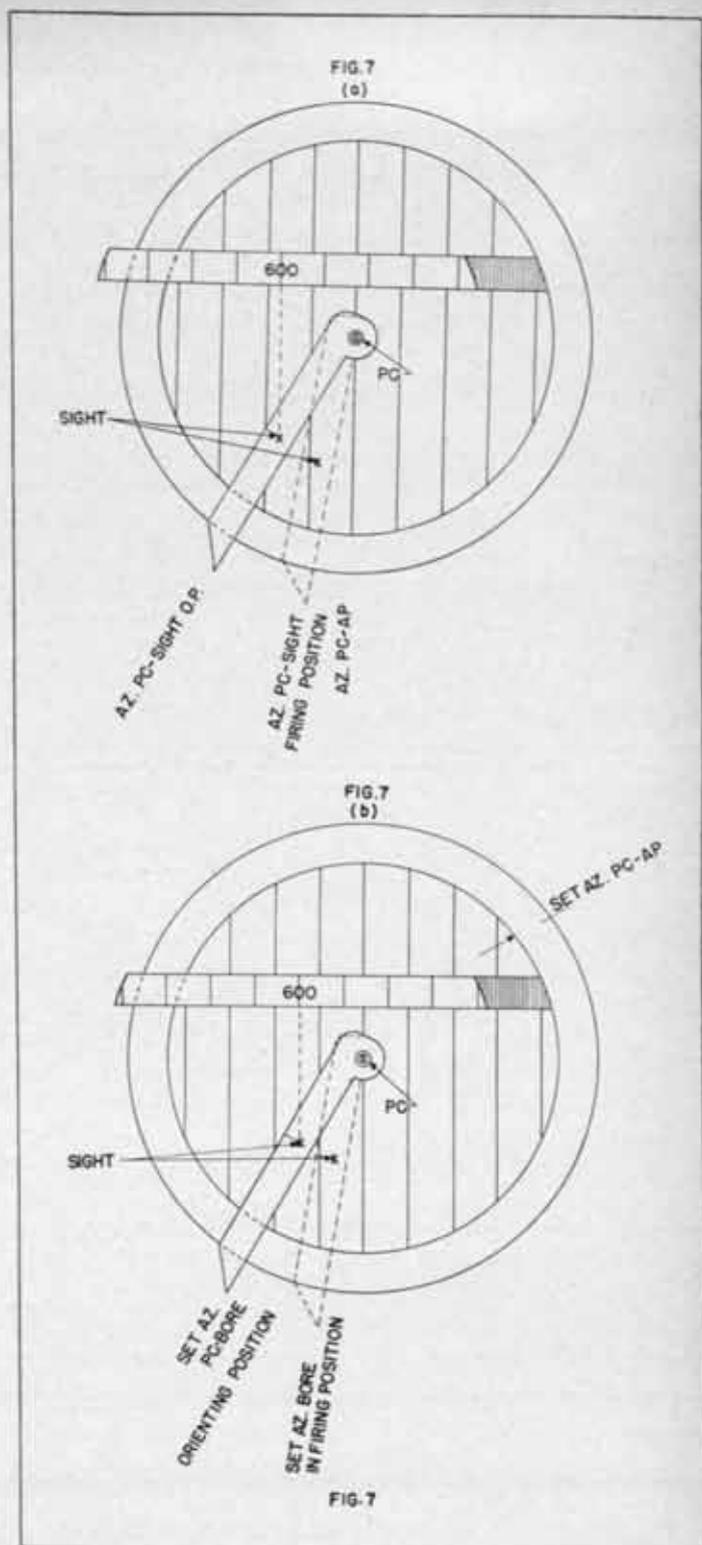
By this method the table of angular errors corresponding to selected distances PC-AP (Table I) was computed.

The parallel lines of the grid are used to measure the angular error. Knowing the maximum angle the grid must accommodate, i.e.  $0.944^\circ$  at 40 yards, the grid may now be constructed. The scale used is  $1/20$ th inch =  $0.01^\circ$ . The smallest graduation is  $0.02^\circ$ . To accommodate a radius of error of  $0.944^\circ$  the disk must have a radius of at least 4.72 inches. Having laid out this circle, draw a diameter or center line across it, then place parallel lines  $2/20$ ths inch apart each way from the center line until the grid is covered. It will be convenient to accent the center line and each fifth line therefrom as an aid in reading.

The second disk has an azimuth circle around its border. Graduations of one degree will be sufficient. It is a little larger than the first disk so that when pivoted behind it the azimuth circle can be read at the edge of the grid. The arm is constructed with a straight line for its reading edge, and with a projection of this line passing through the pivot point.

Next the two disks and the arm are fastened together. A small bolt and nut is used for a pivot. The graduations on the arm are marked off by measuring from the grid. First set the arm at right angles to the direction of the lines of the grid. Then mark a graduation on the arm at the point of the maximum angular error for each distance PC-AP using the angles computed in table I. Label each graduation to read the corresponding distance PC-AP.

Then adjust the azimuth circle to read the angle muzzle



—pintle center—sight opposite one end of the center line of the grid. This angle was calculated to be  $117.65^\circ$ . At the edge of the grid, and pointing to the zero of the azimuth circle place an arrow. This arrow is to be used as an index. The rule is now complete except for the slide. Reference numbers are placed on the slide labelling the lines of the grid. These numbers run from right to left with the normal of the reference number system on the center line. By moving the slide these labels may be positioned on the grid as required.

Actually the rule is a graphic representation of the problem (figure 7, (a)). The azimuth PC-AP is set using

TABLE I

Distance PC-AP	Parallax Angle	
40 yards	0.944	degrees
50	0.755	
60	0.629	
70	0.539	
80	0.472	
90	0.419	
100	0.377	
125	0.302	
150	0.252	
175	0.216	
200	0.189	
250	0.151	
300	0.126	
350	0.108	
400	0.094	
500	0.076	
600	0.063	
800	0.047	
1000	0.038	
1500	0.026	

the base of the center line of the grid as an index. This places the lines of the grid parallel to this azimuth. Then the arm is swung to the azimuth PC-sight in orienting position. The distance PC-sight (in the graphic presentation) is the distance from the pivot point to the graduation on the arm labelled with the particular distance PC-AP. Since there is zero error in the orienting position the normal (zero) of the slide is adjusted to the line of the grid on which the sight is located. The rule is now oriented. By swinging the arm to the azimuth PC-sight that corresponds to a particular azimuth of the bore the sight (represented by the arm graduation) is moved from the parallel of zero correction. By reading the reference numbers of the line the sight is now on, the correction for angular error due to displacement of the sight is obtained.

However, in the above procedure several azimuths are used that are available only after some computations. To accomplish the identical result using data available in the

plotting room without computations the operation of the rule is modified. Azimuths of the axis of the bore are substituted for azimuths PC-sight (figure 7, b). To permit this without changing relationships in the graphical presentation, the index arrow is used to set the azimuth PC-AP. This arrow is displaced counterclockwise from the base of the center line of the grid by the difference between the azimuth of the axis of the bore and the azimuth PC-sight, in this case  $117.65^\circ$ . In effect this angle is added to the azimuth PC-sight, then to retain the proper relationships it is subtracted from the azimuth PC-AP.

After completing the orientation of the board for use with an aiming point by positioning the slide, only the arm is moved for use with this aiming point. When a firing azimuth is determined, set the arm to that azimuth, locate the line indicated by the graduation on the arm (distance PC-AP), follow the line to the slide and read in reference numbers the correction required to counteract the error introduced by sight displacement. It should be necessary to determine this correction only one time during a particular series of shots, as fire adjustment will absorb the small and gradual changes in the amount of error.

It will prove desirable to type out the following rules for operation of the rule and place them on the back of it, or in some other convenient place:

#### OPERATING PROCEDURE

1. Set azimuth from pintle center of gun to aiming point at the arrow.
2. Set arm to azimuth of the bore when in the orienting position.
3. Adjust the slide so that its normal is in line with the arm graduation representing the distance from the pintle center to the aiming point.  
THE BOARD IS NOW ORIENTED FOR USE WITH THIS AIMING POINT. THIS PROCEDURE MUST BE REPEATED WITH EACH CHANGE OF AIMING POINT.
4. Set the arm to the azimuth to which the gun is to be pointed.
5. Read the correction for sight displacement in reference numbers opposite the graduation on the arm which represents the distance from the pintle center to the aiming point.



Jack-rabbit starts, sudden stops and speeding on curves have a harmful effect on both synthetic and natural rubber tires. That's why smooth driving is actually a duty—it's the number one preventive maintenance service of tire operation.

# Polaris Orientation Chart for the Northern Hemisphere

By Lieutenant Colonel John Parmakian, Coast Artillery Corps

The position and appearance of the North Star (Polaris) are known to nearly everyone. This article describes the use and construction of a circular chart which will give the azimuth and angular height of Polaris to the nearest mil for any time of darkness from any given area north of the equator. These charts have been found to be very useful for quickly and accurately orienting artillery batteries which are located within the area for which the chart applies. The construction and use of these charts is quite easy and is explained in detail below with an illustrated chart for the island of Oahu, T. H. These charts are applicable for the years 1943 to 1950 inclusive.

In order to obtain an accuracy of about one mil in azimuth, the latitude and longitude of the place of observation should be known to within 2 degrees and the standard civil time within an accuracy of about five minutes. In order to obtain an accuracy about one mil in angular height the latitude of the place of observation should be known to a greater accuracy or within about four minutes. The area for which one chart may be used with a one mil accuracy is about 200 miles in latitude and longitude.

## CONSTRUCTION OF CHART

The complete orientation chart consists of three discs as shown in figures 1, 2, and 3. These discs may be cut out or copied to form the complete chart. The outer date disc, shown in figure 1, consists of a complete annual date circle for the entire year. The middle disc, shown in figure 2, consists of two concentric rows of ninety-six blocks spaced uniformly around the circumference. The azimuth and angular height of Polaris from the area for a complete cycle are recorded in these blocks. This disc also has a scale for correcting for the difference between local mean time and standard civil time. The movable inner disc, shown in figure 3, consists of forty-eight fifteen-minute time intervals spaced uniformly around the semi-circle. The semi-circle is graduated from 1800 (6:00 P.M.) war time to 0600 (6:00 A.M.) war time for the hours of darkness for which orientation data may be desired.

The following steps are required to construct a chart for any area:

1. Select as the origin a point near the center of the area for which the chart is to apply and obtain its latitude and longitude.
2. Enter Table I below with the latitude of the area and, interpolating if necessary, obtain the azimuth of Polaris for a complete cycle of ninety-six time intervals. Record these ninety-six values in the ninety-six blocks of the inner row of the middle disc starting with the block marked "Start Readings Here" and continuing in a clockwise direction around the circle.

3. Convert the latitude of the origin into mils. Add to this latitude each of the ninety-six values given in Table II below. The resulting ninety-six values are the angular height of Polaris for a complete cycle of ninety-six time intervals. Record these values in the ninety-six blocks on the outer row of the middle disc starting with the block marked "Start Readings Here" and continuing in a clockwise direction around the circle.
4. Compute the difference in longitude between the longitude of the area and the longitude of the standard

		TABLE I																			
		North Latitude																			
#		10° 15'	10° 30'	11° 00'	11° 30'	12° 00'	12° 30'	13° 00'	13° 30'	14° 00'	14° 30'	15° 00'	15° 30'	16° 00'	16° 30'	17° 00'	17° 30'	18° 00'	18° 30'	#	
1	0408	0408	0408	0408	0409	0409	0410	0410	0411	0412	0414	0416	0418	0420	0423	0426	0430	0434	0438	+ 16	1
2	0407	0407	0407	0407	0408	0408	0409	0409	0410	0411	0413	0415	0417	0420	0424	0428	0433	0438	0444	+ 17	2
3	0406	0406	0406	0406	0407	0407	0408	0408	0409	0410	0412	0414	0416	0419	0423	0428	0434	0440	0447	+ 17	3
4	0405	0405	0405	0405	0406	0406	0407	0407	0408	0409	0411	0413	0415	0418	0423	0429	0435	0442	0450	+ 17	4
5	0404	0404	0404	0404	0405	0405	0406	0406	0407	0408	0410	0412	0414	0417	0422	0428	0435	0443	0451	+ 18	5
6	0403	0403	0403	0403	0404	0404	0405	0405	0406	0407	0409	0411	0413	0416	0421	0427	0434	0442	0450	+ 18	6
7	0402	0402	0402	0402	0403	0403	0404	0404	0405	0406	0408	0410	0412	0415	0420	0426	0433	0441	0449	+ 18	7
8	0401	0401	0401	0401	0402	0402	0403	0403	0404	0405	0407	0409	0411	0414	0419	0425	0432	0440	0448	+ 18	8
9	0400	0400	0400	0400	0401	0401	0402	0402	0403	0404	0406	0408	0410	0413	0418	0424	0431	0439	0447	+ 18	9
10	0399	0399	0399	0399	0400	0400	0401	0401	0402	0403	0405	0407	0409	0412	0417	0423	0430	0438	0446	+ 18	10
11	0398	0398	0398	0398	0399	0399	0400	0400	0401	0402	0404	0406	0408	0411	0416	0422	0429	0437	0445	+ 18	11
12	0397	0397	0397	0397	0398	0398	0399	0399	0400	0401	0403	0405	0407	0410	0415	0421	0428	0436	0444	+ 18	12
13	0396	0396	0396	0396	0397	0397	0398	0398	0399	0400	0402	0404	0406	0409	0414	0420	0427	0435	0443	+ 17	13
14	0395	0395	0395	0395	0396	0396	0397	0397	0398	0399	0401	0403	0405	0408	0413	0419	0426	0434	0442	+ 17	14
15	0394	0394	0394	0394	0395	0395	0396	0396	0397	0398	0400	0402	0404	0407	0412	0418	0425	0433	0441	+ 16	15
16	0393	0393	0393	0393	0394	0394	0395	0395	0396	0397	0399	0401	0403	0406	0411	0417	0424	0432	0440	+ 16	16
17	0392	0392	0392	0392	0393	0393	0394	0394	0395	0396	0398	0400	0402	0405	0410	0416	0423	0431	0439	+ 16	17
18	0391	0391	0391	0391	0392	0392	0393	0393	0394	0395	0397	0399	0401	0404	0409	0415	0422	0430	0438	+ 16	18
19	0390	0390	0390	0390	0391	0391	0392	0392	0393	0394	0396	0398	0400	0403	0408	0414	0421	0429	0437	+ 16	19
20	0389	0389	0389	0389	0390	0390	0391	0391	0392	0393	0395	0397	0399	0402	0407	0413	0420	0428	0436	+ 16	20
21	0388	0388	0388	0388	0389	0389	0390	0390	0391	0392	0394	0396	0398	0401	0406	0412	0419	0427	0435	+ 16	21
22	0387	0387	0387	0387	0388	0388	0389	0389	0390	0391	0393	0395	0397	0400	0405	0411	0418	0426	0434	+ 16	22
23	0386	0386	0386	0386	0387	0387	0388	0388	0389	0390	0392	0394	0396	0399	0404	0410	0417	0425	0433	+ 16	23
24	0385	0385	0385	0385	0386	0386	0387	0387	0388	0389	0391	0393	0395	0398	0403	0409	0416	0424	0432	+ 16	24
25	0384	0384	0384	0384	0385	0385	0386	0386	0387	0388	0390	0392	0394	0397	0402	0408	0415	0423	0431	+ 16	25
26	0383	0383	0383	0383	0384	0384	0385	0385	0386	0387	0389	0391	0393	0396	0401	0407	0414	0422	0430	+ 16	26
27	0382	0382	0382	0382	0383	0383	0384	0384	0385	0386	0388	0390	0392	0395	0400	0406	0413	0421	0429	+ 16	27
28	0381	0381	0381	0381	0382	0382	0383	0383	0384	0385	0387	0389	0391	0394	0399	0405	0412	0420	0428	+ 16	28
29	0380	0380	0380	0380	0381	0381	0382	0382	0383	0384	0386	0388	0390	0393	0398	0404	0411	0419	0427	+ 16	29
30	0379	0379	0379	0379	0380	0380	0381	0381	0382	0383	0385	0387	0389	0392	0397	0403	0410	0418	0426	+ 16	30
31	0378	0378	0378	0378	0379	0379	0380	0380	0381	0382	0384	0386	0388	0391	0396	0402	0409	0417	0425	+ 16	31
32	0377	0377	0377	0377	0378	0378	0379	0379	0380	0381	0383	0385	0387	0390	0395	0401	0408	0416	0424	+ 16	32
33	0376	0376	0376	0376	0377	0377	0378	0378	0379	0380	0382	0384	0386	0389	0394	0400	0407	0415	0423	+ 16	33
34	0375	0375	0375	0375	0376	0376	0377	0377	0378	0379	0381	0383	0385	0388	0393	0399	0406	0414	0422	+ 16	34
35	0374	0374	0374	0374	0375	0375	0376	0376	0377	0378	0380	0382	0384	0387	0392	0398	0405	0413	0421	+ 16	35
36	0373	0373	0373	0373	0374	0374	0375	0375	0376	0377	0379	0381	0383	0386	0391	0397	0404	0412	0420	+ 16	36
37	0372	0372	0372	0372	0373	0373	0374	0374	0375	0376	0378	0380	0382	0385	0390	0396	0403	0411	0419	+ 16	37
38	0371	0371	0371	0371	0372	0372	0373	0373	0374	0375	0377	0379	0381	0384	0389	0395	0402	0410	0418	+ 16	38
39	0370	0370	0370	0370	0371	0371	0372	0372	0373	0374	0376	0378	0380	0383	0388	0394	0401	0409	0417	+ 16	39
40	0369	0369	0369	0369	0370	0370	0371	0371	0372	0373	0375	0377	0379	0382	0387	0393	0400	0408	0416	+ 16	40
41	0368	0368	0368	0368	0369	0369	0370	0370	0371	0372	0374	0376	0378	0381	0386	0392	0400	0408	0416	+ 16	41
42	0367	0367	0367	0367	0368	0368	0369	0369	0370	0371	0373	0375	0377	0380	0385	0391	0398	0406	0414	+ 16	42
43	0366	0366	0366	0366	0367	0367	0368	0368	0369	0370	0372	0374	0376	0379	0384	0390	0397	0405	0413	+ 16	43
44	0365	0365	0365	0365	0366	0366	0367	0367	0368	0369	0371	0373	0375	0378	0383	0389	0396	0404	0412	+ 16	44
45	0364	0364	0364	0364	0365	0365	0366	0366	0367	0368	0370	0372	0374	0377	0382	0388	0395	0403	0411	+ 16	45
46	0363	0363	0363	0363	0364	0364	0365	0365	0366	0367	0369	0371	0373	0376	0381	0387	0394	0402	0410	+ 16	46
47	0362	0362	0362	0362	0363	0363	0364	0364	0365	0366	0368	0370	0372	0375	0380	0386	0393	0401	0409	+ 16	47
48	0361	0361	0361	0361	0362	0362	0363	0363	0364	0365	0367	0369	0371	0374	0379	0385	0392	0400	0408	+ 16	48
49	0360	0360	0360	0360	0361	0361	0362	0362	0363	0364	0366	0368	0370	0373	0378	0384	0391	0399	0407	+ 16	49
50	0359	0359	0359	0359	0360	0360	0361	0361	0362	0363	0365	0367	0369	0372	0377	0383	0390	0398	0406	+ 16	50
51	0358	0358	0358	0358	0359	0359	0360	0360	0361	0362	0364	0366	0368	0371	0376	0382	0389	0397	0405	+ 16	51
52	0357	0357	0357	0357	0358	0358	0359	0359	0360	0361	0363	0365	0367	0370	0375	0381	0388	0396	0404	+ 16	52
53	0356	0356	0356	0356	0357	0357	0358	0358	0359	0360	0362	0364	0366	0369	0374	0380	0387	0395	0403	+ 16	53
54	0355	0355	0355	0355	0356	0356	0357	0357	0358	0359	0361	0363	0365	0368	0373	0379	0386	0394	0402	+ 16	54
55	0354	0354	0354	0354	0355	0355	0356	0356	0357	0358	0360	0362	0364	0367	0372	0378	0385	0393	0401	+ 16	55
56	0353	0353	0353	0353	0354	0354	0355	0355	0356	0357	0359	0361									

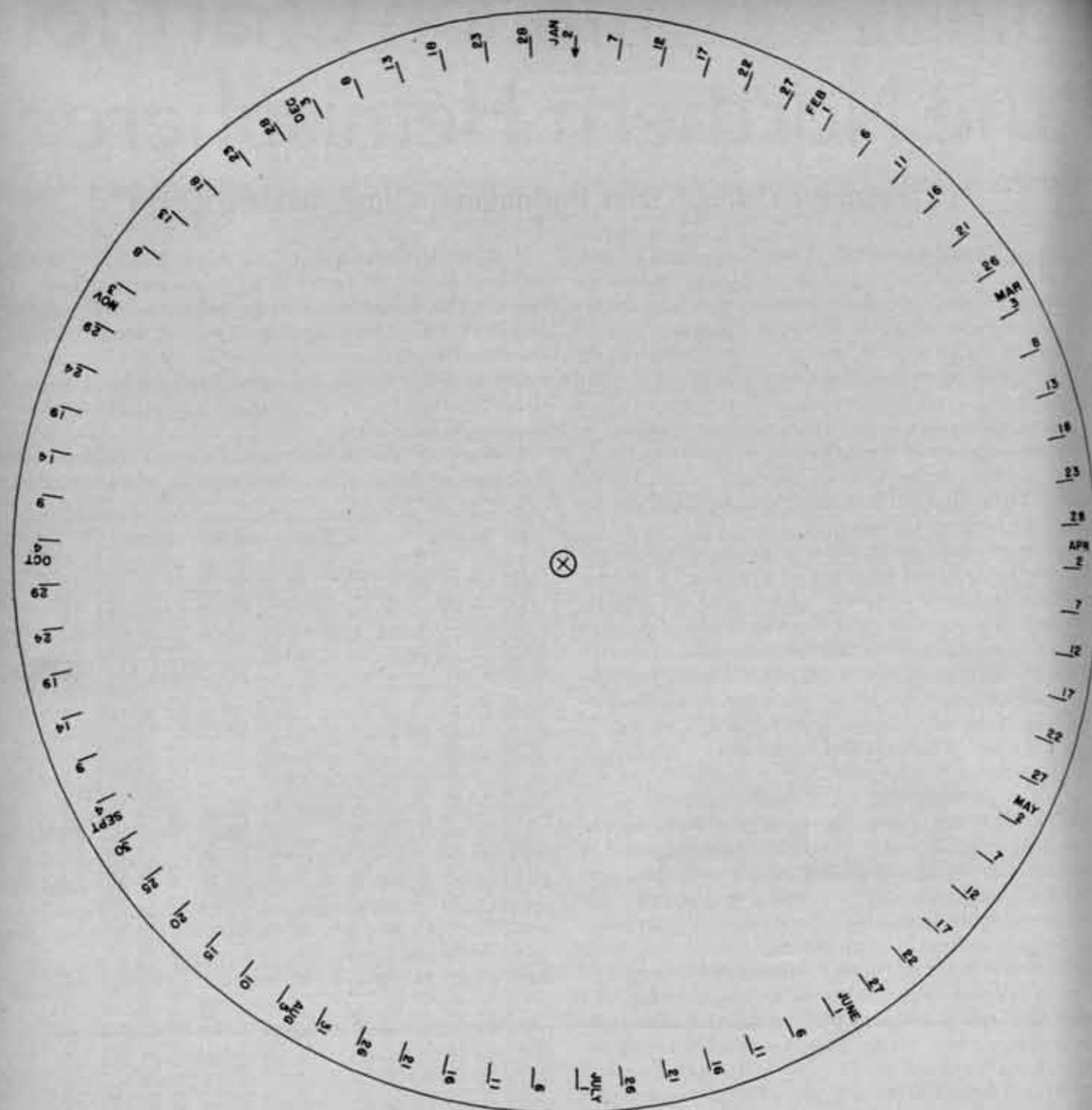


Figure 1

time meridian that applies for the area. Set the middle disc over the outer disc at a common center so that this difference in longitude is set on the middle disc opposite the small arrow at January 2 on the outer disc. (For example, if the area for which the chart is constructed is  $5^{\circ}$  west of the standard time meridian, the setting of  $5^{\circ}$  west on the middle disc is set opposite January 2 on the outer disc.) This will orient the two discs for the area for which the chart applies. Now paste or staple these two discs together with this setting. Hereafter, these two discs will be used as one disc.

5. As an observer moves north or south of the origin the angular height of Polaris will increase or decrease one mil for each 3.9 miles. Draw a sketch of the area for which

the chart applies on the inner movable disc and divide it into one-mil horizontal strips starting from a point a half mil or 1.95 miles above and below the origin. Mark each strip north of the origin in increments of plus one mil and those south of the origin in increments of minus one mil.

6. Pin the inner movable disc and the composite outer disc at the center to form the completed chart.

#### USE OF CHART

To use the chart, set the index arrow of the inner movable disc opposite the date on the outer disc for which the orientation data is desired. Since the dates on the outer ring are for five-day intervals throughout the year, it may be necessary to interpolate, that is, set the index arrow between

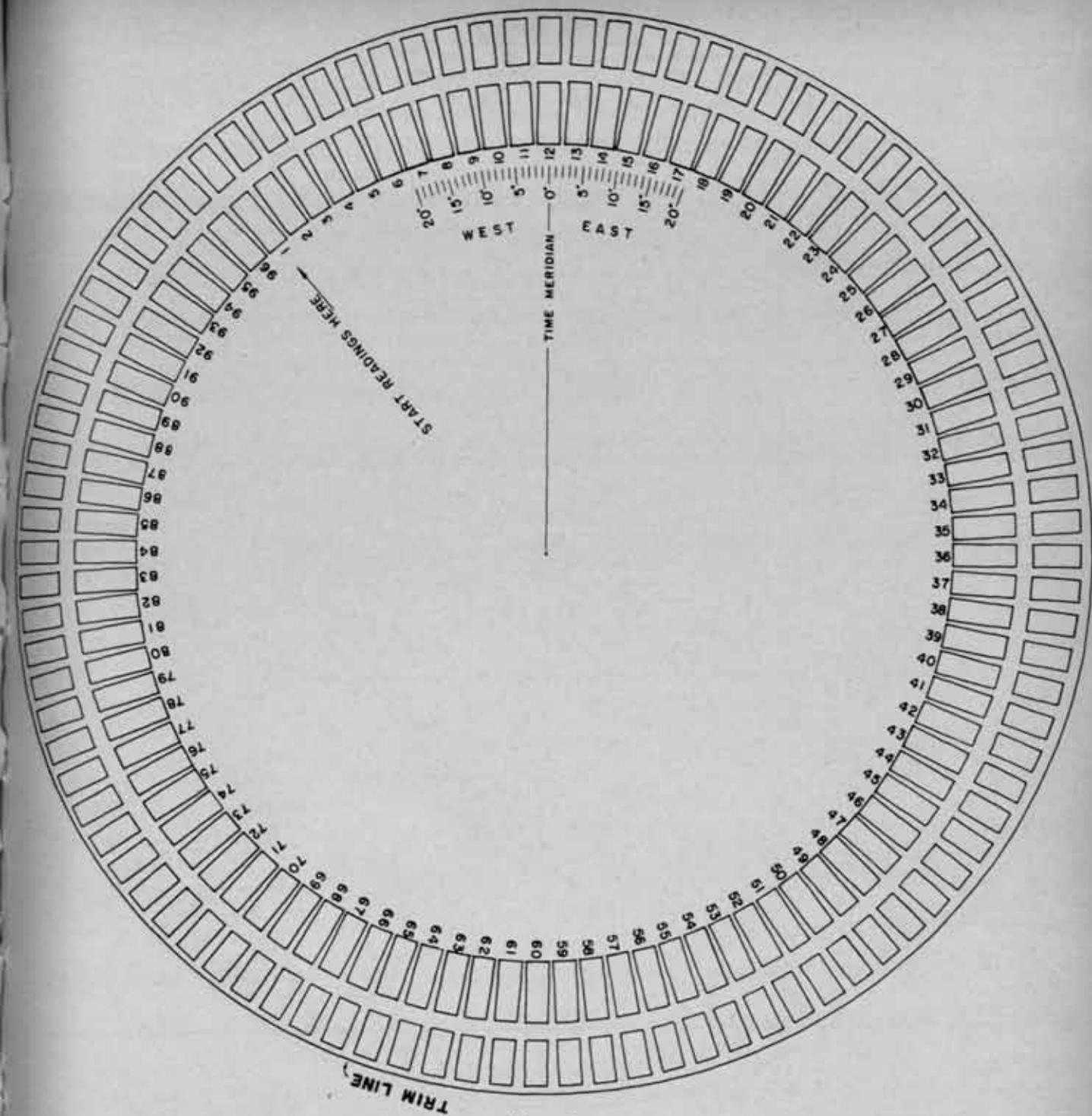


Figure 2

the dates given on the chart. The azimuth and angular height of Polaris can then be obtained by reading the numbers on the outer disc opposite the time shown on the inner disc. Although the time intervals on the inner disc are given for each fifteen minutes, the data for any time between these time intervals can also be obtained by interpolation. Note that with one setting of the movable inner disc, orientation data for Polaris can be obtained from 1800 (6:00 P.M.) on the date selected to 0600 (6:00 A.M.) on the following day.

A small correction must now be added to the angular height only depending on the position of the observer in the area. This correction can be obtained from the map shown on the inner disc.

## ILLUSTRATION

Suppose that an orientation chart is desired for the island of Oahu, T. H. The necessary steps in the construction of the chart are as follows:

1. The point selected as the origin near the center of the island is at longitude West  $158^\circ$  and latitude North  $21^\circ 30'$ .
2. From Table I for a latitude North  $21^\circ 30'$ , the ninety-six values of the azimuth of Polaris for a complete cycle are 6408, 6407, 6406, 6405, etc. These are recorded on the disc shown in figure 4.
3. The latitude  $21^\circ 30'$  expressed in miles is 382 miles. When the values from Table II are added to 382 miles the

USE OF CHART

SET THE INDEX LINE OF THE INNER DISC OPPOSITE THE DATE. IF NECESSARY INTERPOLATE BETWEEN THE DATES SHOWN. THE AZIMUTH AND ANGULAR HEIGHT OF POLARIS CAN THEN BE READ TO THE NEAREST MIL BY NOTING THE READINGS OPPOSITE THE TIME DESIRED.

A CONSTANT CORRECTION IN ANGULAR HEIGHT ONLY MUST BE ADDED DEPENDING UPON THE OBSERVER'S LOCATION IN THE AREA. THIS CORRECTION IS OBTAINED BY CONSULTING THE MAP BELOW.

POLARIS ORIENTATION CHART FOR \_\_\_\_\_

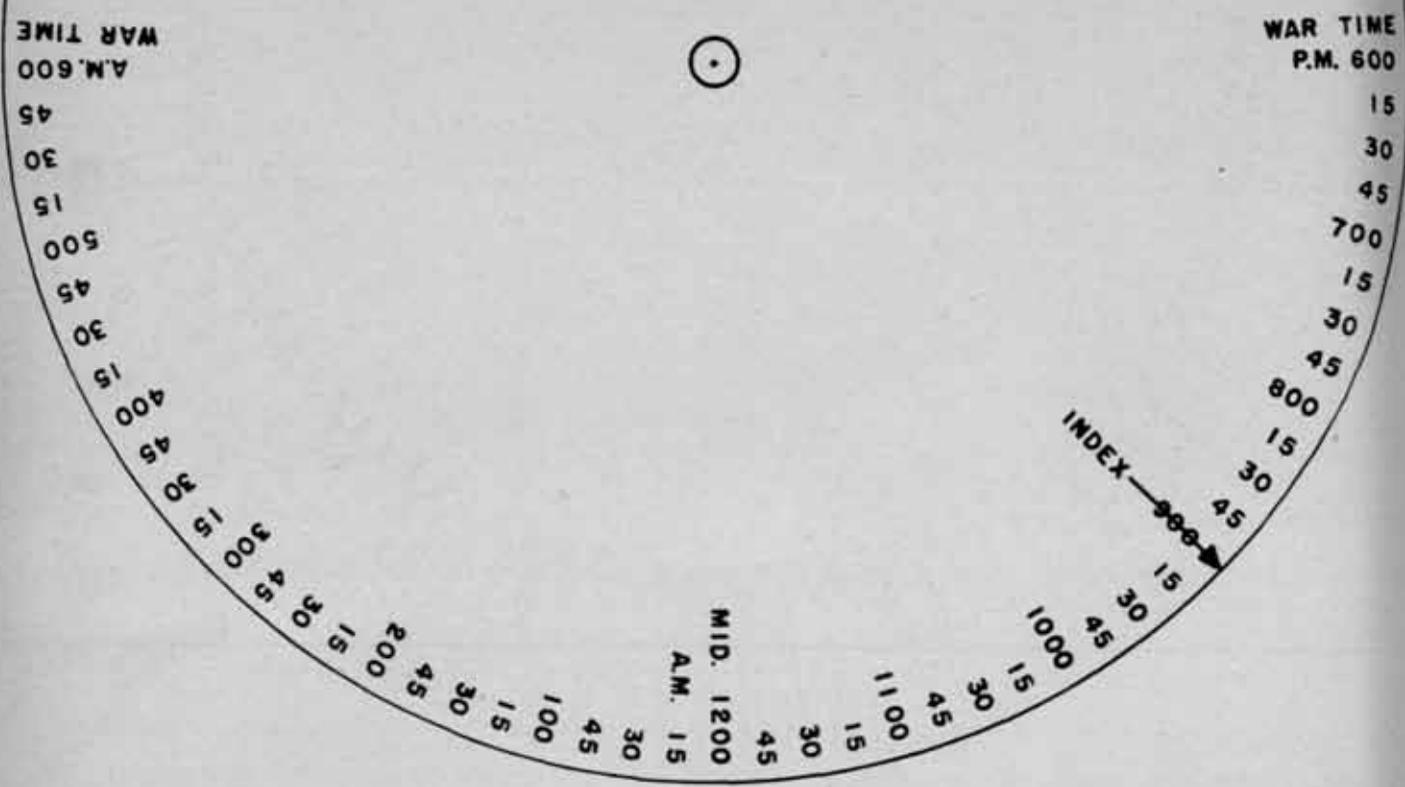


Figure 3

ninety-six values of angular height to be recorded on the center disc are 398, 399, 400, etc. These are recorded on the outer row of the middle disc.

4. The standard time meridian for Hawaiian standard time is at 157°30' West longitude. The longitude at the origin of the area for which the chart is to apply is a half degree west of the time meridian. Set the outer disc so that the arrow at January 2 is opposite the half degree west graduation on the middle disc. With this setting the outer and middle discs are stapled together to form a composite disc.

5. Draw a sketch of the island to scale on the inner movable disc and divide it into one-mil strips starting from a

point a half mil above and below the origin. Mark these strips in increments of one mil as shown in figure 4.

6. Pin the inner movable disc and the composite disc to form the completed chart.

In order to illustrate the use of this chart suppose that it is required to determine orientation data for 11 July at 2045 (8:45 P.M.) Hawaiian war time for the northernmost point on the island. Upon setting the index of the movable disc opposite 13 July, the azimuth and angular height for time 2045 will be found to be 6406 mils and 365 mils. The correction in angular height for the northernmost point on the island is plus 3 mils, which gives an angular height of 368 mils.

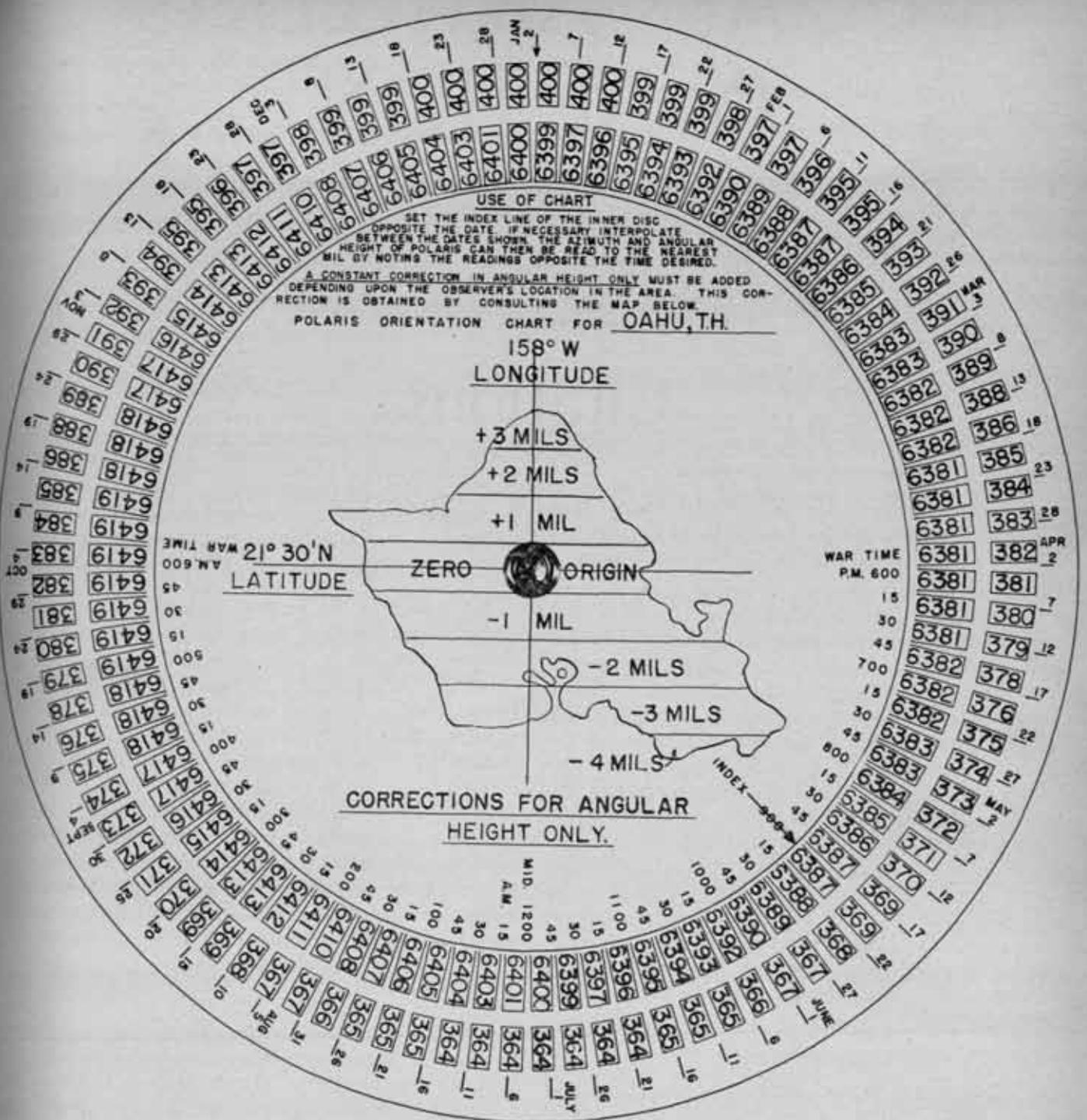


Figure 4



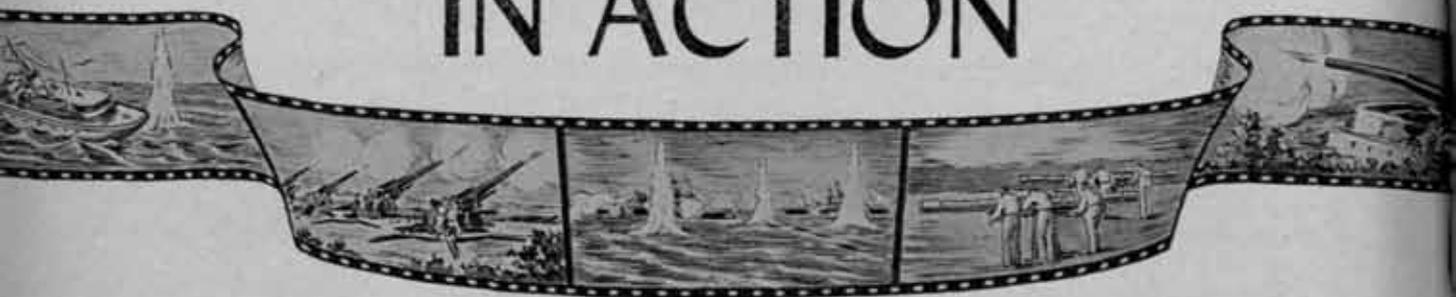
**Be Patient!!**

Indicative of the delays which occur in current shipments of items purchased from the JOURNAL, we quote an extract from a letter we received on March 18:

" . . . today I received the balance of the books ordered. The envelope corresponds to the first shipment . . . is dated September 10, 1943."

The time in transit in this case was over six months.

# COAST ARTILLERY IN ACTION



## Citations

### Distinguished Service Medal

TO: PAUL D. BUNKER, Colonel, Coast Artillery Corps. Posthumous. Next of kin: Mrs. Landon B. Bunker, Widow, 538 South Van Ness Avenue, Los Angeles, California.

FOR: Exceptionally meritorious service to the Government in a position of great responsibility at Fort Mills, Corregidor, Philippine Islands, from December 8, 1941, to May 6, 1942. As commander of the Seaward Defenses of Manila Bay, Colonel Bunker constantly maintained his command in a state of instant readiness to repel hostile naval attack. In addition to the normal function of the weapons of his command he repeatedly engaged hostile land targets on both shores of Manila Bay, contributing materially to the defensive operations of the mobile land forces. Colonel Bunker displayed courageous and incessant devotion to duty in directing the activities of his batteries and in supervising the immediate repair of damage inflicted by enemy bombardment. His inspiring leadership maintained superior morale and efficiency in his command throughout the campaign. (Colonel Bunker was reported as having died September 7, 1943, while a prisoner of war of the Japanese government.)

### Legion of Merit

TO: ROBERT D. BROWN, Colonel (then Lieutenant Colonel), Coast Artillery Corps, General Staff Corps. Home address: Nashville, Tennessee.

FOR: Exceptionally meritorious conduct in the performance of outstanding service as Military Attaché to the American Embassy, Brussels, Belgium, immediately preceding, during and after the invasion of Belgium in the spring of 1940. By his keen insight, profound knowledge and diligent investigation of the situation he was directly responsible for the accurate reports and appraisals that were furnished the War Department concerning the invasion of the Lowlands. He emphasized the inevitability of this result and so advised our Ambassador. When the invasion came he courageously remained at his post until contact was actually made by the invading German Army. Brussels was at that time under threat of destruction by bombing, but the personal risks unhesitatingly assumed by Colonel Brown enabled him to obtain valuable information that

otherwise would not have been available to the War Department. Colonel Brown by his actions demonstrated the qualities of diplomat and soldier to a marked degree, and by his initiative, courage, intelligence and forceful action accomplished his mission with exceptional success.

TO: CHARLES R. FINLEY, Colonel, (Coast Artillery Corps) General Staff Corps. Home address: Philadelphia, Pennsylvania.

FOR: Exceptionally meritorious conduct in the performance of outstanding services as organizer and commanding officer of a Coast Artillery (AA) unit from November 1, 1939, to February 8, 1940, and as Chief of Staff, Panama Coast Artillery Command from February 9, 1940, to August 29, 1941. His industry, keen foresight and staff leadership under adverse weather conditions and lack of adequate transportation facilities contributed materially to the successful reorganization, expansion, and combat efficiency of the seacoast and antiaircraft defenses of the strategically vital Panama Canal.

TO: JOSEPH B. FRASER, Colonel, Coast Artillery Corps. Home address: Hinesville, Georgia.

FOR: Exceptionally meritorious conduct in the performance of outstanding services at Port Moresby, New Guinea, from April 28, 1942, to April 3, 1943. Colonel Fraser planned and organized an effective Allied antiaircraft defense of Port Moresby which at the time was subjected to repeated enemy aerial attacks. His ability and leadership led to his being designated as Commander of Antiaircraft Artillery Defenses for the New Guinea forces. By his tactful handling of both United States and Australian antiaircraft artillery he made possible a smooth functioning antiaircraft defense of the Port Moresby area. Colonel Fraser, by his exceptional ability and devotion to duty, made a substantial contribution to our operations during this critical period.

TO: WILLIAM D. FRAZER, Colonel, Coast Artillery, Seattle.

FOR: Exceptionally meritorious conduct in the performance of outstanding service as Commanding Officer of a Coast Artillery (AA) Regiment at an Alaskan Base during the period from March 13, 1941, to October 2, 1943. His

mature leadership was a constant inspiration to his regiment throughout the critical period when failure to fulfill its tactical mission might have compromised the security of an important Alaskan base. His sincerity, military knowledge, and conscientious interest in the welfare of his men contributed to the successful accomplishment of his mission in spite of severe hardships. Later as Post Commander of this same station he shouldered the added responsibilities in the same exemplary manner.

TO: EUGENE J. WELTE, Lieutenant Colonel, Coast Artillery Corps. Home address: 56 East Ferry Street, Buffalo, New York.

FOR: Exceptionally meritorious conduct in the performance of outstanding services in the Southwest Pacific Area from March 12, to November 5, 1942. Colonel Welte, commanding an antiaircraft artillery automatic weapons battalion, effected within four days the movement of his unit by air from Brisbane to Darwin, about 1,800 miles, and its establishment in tactical position. The success of this movement was the basis for further experimentation in air transportation of antiaircraft artillery units. In an isolated area, he created within his organization a high state of morale and combat efficiency. Through his personnel efforts, cordial relations between United States and Australian personnel were established, resulting in close cooperation. Colonel Welte by his leadership, tact and devotion to duty performed a valuable service.

TO: BENEDICT M. HOLDEN, JR., Major, Coast Artillery Corps. Home address: 9 Walbridge Road, West Hartford, Connecticut.

FOR: Exceptionally meritorious conduct in the performance of outstanding services in the Southwest Pacific Area from March 16 to October 30, 1943. Major Holden and another officer developed a system of antiaircraft operations intelligence whereby Air Force elements about to engage in combat were provided with complete and accurate information concerning the air areas in which hostile antiaircraft gunfire or automatic weapons fire was to be expected, the probable intensity of such fire and the location of known enemy searchlight and aircraft warning installations. The development of this system involved an analytical study of enemy antiaircraft weapons, matériel, tactics and installations. The plan provided a basis for determining the direction of approach to hostile targets least exposed to interference from enemy antiaircraft activity. Major Holden performed a valuable service in undertaking this work which resulted in substantial saving of lives and aircraft.

TO: CLINTON F. HEGG, Captain, Coast Artillery Corps. Home address: St. Louis Park, Minnesota.

FOR: Exceptionally meritorious conduct in the performance of outstanding services in the Southwest Pacific Area from March 16 to October 30, 1943, Captain Hegg and another officer developed a system of antiaircraft operations intelligence whereby Air Force elements about to engage in combat were provided with complete and accurate information concerning the air areas in which hostile antiaircraft gunfire or automatic weapons fire was to be expected, the probable intensity of such fire and the location of known

enemy searchlight and aircraft warning installations. The development of this system involved an analytical study of enemy antiaircraft weapons, matériel, tactics and installations. The plan provided a basis for determining the direction of approach to hostile targets least exposed to interference from enemy antiaircraft activity. Captain Hegg performed a valuable service in undertaking this work which resulted in substantial saving of lives and aircraft.

TO: BERNARD L. BAUER, Master Sergeant, Coast Artillery. Home address: 1520 Stevens Street, Parsons, Kansas.

FOR: Exceptionally meritorious conduct in the performance of outstanding service. Master Sergeant Bauer, through skill, industry and good judgment, made available two excellent antimechanized ranges at the Antiaircraft Artillery Training Center, Fort Bliss, Texas, and rendered outstanding service as an instructor in mathematics at the preparatory school for candidates for the Officer Candidate School. Because of his ingenuity and tireless perseverance, the antimechanized ranges were constructed with no cost to the Government. His work as an instructor was habitually conducted at night after a full day's work as a master gunner and it was eminently successful.

#### Silver Star

TO: LINDSEY P. HENDERSON, JR., Sergeant, Coast Artillery.

FOR: Gallantry in action near Port Moresby, New Guinea, on July 26, 1942.

#### Soldier's Medal

TO: ALEXANDER A. CAPPELLA, Technician Fifth Grade, Coast Artillery Corps. Home address: 129 Sawyer Avenue, Lancaster, New York.

FOR: Heroism on January 2, 1944, in Sicily. A mountainous wave broke over the north jetty in Palermo Harbor just before daybreak, sweeping a kitchen hut and equipment and two members of a 40mm gun section into an exceptionally rough sea. Technician Cappella, awakened by the cries for help, rushed out of his hut and at the risk of his life plunged into the turbulent water. Seeing that one of the victims was already being rescued, he struck out for the other about 25 yards from the jetty. The stormy condition of the harbor and the fact that the man could not swim made his rescue a most difficult and dangerous task. He finally was brought to a ladder on the jetty and hauled out. This display of courage and quick action by Technician Cappella was responsible for saving a soldier from drowning.

TO: CHARLES E. GOSS, Technician Fifth Grade, Coast Artillery Corps. Home address: 1383 Plainfield Street, Johnston, Rhode Island.

FOR: Heroism on January 2, 1944, in Sicily. A mountainous wave broke over the north jetty in Palermo Harbor just before daybreak, sweeping a kitchen hut and equipment and two members of a 40mm gun section into an exceptionally rough sea. Technician Goss, awakened by cries for help, dashed out of his hut and at the risk of his life plunged into the turbulent water. About 25 yards from the jetty, he reached one of the men who was panic stricken

and not able to swim. Despite the unusual violence of the sea and in a state of virtual exhaustion, Technician Goss brought the victim to a ladder on the jetty where he was hauled up by a rope. The man undoubtedly would have drowned were it not for the bravery and complete disregard of personal safety on the part of Technician Goss.

TO: FREDERICK J. SCHAFFER, Private, Coast Artillery Corps. Home address: Rural Route 3, Norwalk, Ohio.

FOR: Heroism on December 14, 1943 at Palermo, Sicily. Sparks from a passing locomotive set fire to 18 interlaced camouflage nets, which formed a canopy over the battery motor pool area. The fire was soon out of control and loss of the 18 vehicles parked therein seemed imminent. When an effort was made to remove some of the vehicles, a section of the burning nets fell on one of the trucks, completely enveloping it. The truck was blazing furiously, and was in great danger of exploding at any moment. Private Schaffer ran to this truck and after struggling with the flaming net, managed to enter the truck and drive it into the sea. In doing this, the other nets were pulled after him and the fire extinguished. By his fearless conduct and quick action he undoubtedly prevented destruction of 18 government vehicles and possible injury to enlisted personnel in the vicinity.

CAPTAIN SAMUEL P. DURR, Medical Corps, 1306 22nd Avenue, Rock Island, Illinois.

CORPORAL RODNEY M. PRESTON, 987 North Church Street, Jacksonville, Illinois.

PRIVATE FIRST CLASS JOHN A. DOBRINSKI, 1182 Sixth Avenue, New York, New York.

PRIVATE FIRST CLASS FRANK J. MCGOWAN, JR., 389 NostRAND Avenue, Brooklyn, New York.

PRIVATE HUBERT MESSENGER, Kingman, Kansas.

All were members of a medical detachment with a Coast Artillery (Antiaircraft) battalion at Porto Empedocle, Sicily, when on October 11, 1943, ammunition on a barge and in a truck at the port exploded, and the barge burned fiercely. Responding to a call for emergency medical assistance, the five soldiers rushed to the scene.

"With utter disregard for his own safety," says the cita-

tion for each of them," he climbed aboard the burning ammunition barge, where he found a number of badly injured and maimed civilians. In the midst of exploding ammunition and while faced with the imminent danger of further major explosions he, with the aid of members of his detachment, succeeded in collecting the maimed and injured and in transferring them to the shore for first aid and evacuation. Through his efficient performance of duty and utter disregard of danger and personal risk, many lives were saved."

#### Presidential Unit Citation

TO: BATTERY F, 78TH COAST ARTILLERY (AA). During the period of May 18-26, 1943, the 3rd Battalion, 32nd Infantry, conducted offensive operations in the high, mountainous region between Holtz Bay and Chichagof Harbor, Attu, Aleutian Islands. The terrain was exceedingly difficult, enemy forces were well dug in and skilfully placed, utilizing to the full the natural defensive qualities of the area. It soon became apparent that close support of the heaviest available accompanying weapons was necessary, and decision was reached to move two 75mm pack howitzers from positions in the relatively low hills between the two arms of Holtz Bay to a new position in direct support of the battalion. The route to these positions was steep, at times almost precipitous, wet and slippery, partly across snow-filled ravines. Manpower was the only answer to the problem. Battery F, 78th Coast Artillery (AA), Captain (then First Lieutenant) William E. Beilke, 724 East Mason Street, Green Bay, Wisconsin, commanding, was the only unit available for the job. After two nights (May 20-21 and May 21-22) of superhuman effort, the howitzers were moved into place, ammunition was supplied, and a necessary preliminary to the taking of Chichagof Pass was accomplished.

#### Personal Commendation

TO: LEO GOVIN, Corporal, Coast Artillery. Home address: 17 Pearl Street, Spencer, Massachusetts.

FOR: Acting upon his own initiative in ordering personnel of a Searchlight Battalion to throw up marker beams for a flight of planes lost and running low on fuel, preventing a possible serious loss of aircraft and men. Brigadier General Joseph E. Harriman wrote the commendation.



Governors aren't installed on equipment to slow down your war effort. They're put there to protect the equipment. Don't permit tampering with governors!



Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problem that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.

## THE COAST ARTILLERY BOARD

COLONEL LEON C. DENNIS, C.A.C., *President*

COLONEL DONALD H. SMITH

LIEUTENANT COLONEL W. M. VESTAL

LIEUTENANT COLONEL ANDREW W. CLEMENT

MAJOR H. E. MICHELET

MAJOR AUSTIN E. FRIBANCE

MAJOR JOHN P. TRAYLOR, O.D.

MAJOR JULES M. DU PARC

CAPTAIN FOSTER A. HINSHAW, S.C.

CAPTAIN W. P. G. HALL

*37mm Subcaliber Tube T25 for the 90mm Gun M1 on Fixed Mount M3.* The Subcaliber Tube T25 has been tested recently and was found to function satisfactorily. The standard breechblock and firing mechanism of the 90mm gun are utilized. A rate of fire of about 28 rounds per gun per minute was obtained even though it was necessary to operate the breechblock manually. The Board recommended that the T25 be standardized and issued on the basis of one per parent gun and mount in service.

*75mm Subcaliber Tube T3 for the 12-inch Gun M1895.* The Subcaliber Tube T3 has been tested recently and was found to function satisfactorily. The standard firing circuit and firing mechanism of the 12-inch gun are used. The Board recommended that the T3 be standardized and issued on the basis of one per parent gun in service. In addition, it was recommended that certain auxiliary equipment be issued with the Subcaliber Tube T3, including the necessary wrenches, headspace adjustment tool and gauge, cleaning equipment, and cartridge case extractors.

*New traversing drive for 16-inch Barbette Carriages M4 and M5.* The new traversing drives which are being installed on 16-inch Barbette Carriages M4 and M5 are modified versions of the old type drives previously used on these carriages. The new modifications were designed primarily to accommodate the additional weight of the shield. The horsepower of the driving motor has been increased from  $7\frac{1}{2}$  to 20, the maximum rate of traverse has been increased slightly, and follow-up control (similar to that used on the Waterbury speed gear elevation drive on 6-inch Barbette Carriages M1 and M3) has been provided. The latter modification was provided so that the gun pointer will be able to follow more accurately continuous data.

*Gravity ramming of projectiles—8-inch Gun Mk VI Mod 42.* It has been reported that the gravity ramming of eight-inch projectiles is not satisfactory. The reports indicate that the long-nosed projectiles are particularly subject to poor seating. One unit, in a target practice report, attributed the poor seatings obtained to the powder residue in the chamber.

Tests conducted under the supervision of the Board indicate that the method of gravity ramming of projectiles, with proper coordination of the ramming detail, is satisfactory. Three men were employed on the ramming detail. Of the eighty rounds fired, all projectiles seated properly except two. In both exceptions, the poor seating was due to improper coordination of the ramming detail, which was noted during the ramming. On the second attempt, each projectile seated properly. No reason is known why powder residue in the chamber should adversely affect ramming.

It is considered that, with intense training of the ramming detail to insure that all projectiles are started straight down the tray, no difficulty will be encountered with gravity ramming of eight-inch projectiles.

*Electric gun data computers.* For a number of years the Coast Artillery Board has been experimenting with sea-coast artillery data computers capable of converting input present position data to firing data for the guns. The first such computer, which is mechanical, was standardized as the Gun Data Computer M1, for 16-inch and 12-inch gun batteries, and has been issued to the field.

A new electric gun data computer (M8) has been standardized for medium caliber armament. The following model designations have been assigned these computers.

a. M8C for 6-inch Guns M1903A2 and M1905A2 on Barbette Carriages of the M1 type.

b. M8F for 8-inch Guns Mk VI, Mod. 3A2, on Barbette Carriage M1 type mounts and Railway Mounts M1A1.

c. M8N for 155mm Guns M1 or M1A1.

The M8 type computer furnishes firing data over the standard data transmission system to each of two gun positions. Input data can be either continuous or intermittent and from a horizontal base or from a single station. Continuous data can be received by the computer from the base-end data transmission system. Two separate present position receiver units (triangle solvers) are provided in the M8C and M8F so that data can be received simultaneously from two different baselines in order that there

will be continuous input of data when changing baselines. A position generator, which continues to generate present position data, based upon unchanged course and speed, is available in the event of temporary interruption of the position finding system.

The computer provides for complete ballistic corrections. Each ballistic unit provides for three different types of ammunition, including subcaliber. The only plotting room fire control equipment needed in addition to the computer is a spotting board (if spotting stations are used) and fire adjustment boards.

The electric gun data computer is more accurate than the mechanical Gun Data Computer M1 and has a marked superiority on maneuvering courses.

The Coast Artillery School is contemplating starting a course of instruction on this equipment sometime during this year.

*Water supply for 6-, 8-, 12-, and 16-inch barbette carriage power plants.* Action is being taken to make available a protected water supply in the emplacements for 6-, 8-, 12-, and 16-inch batteries to assure sufficient water for the evaporative coolers of the power plants. It is probable that this protected water supply will be sufficient to afford at least twelve hours continuous operation of two engines at full load, or sufficient to provide the same conditions of operation of the power plants as are afforded by the protected fuel supply, whichever is greater. The storage tanks which will be necessary for the protected water supply will be located in the muffler gallery when practicable, or in such other places within the emplacement as may be dictated by the space available.

It is understood that provision is also being made to install a steam heating system in the 6-, 8-, 12-, and 16-inch batteries in question in order that the freezing of water in the power room, the muffler gallery, and the evaporative cooler room may be prevented.

*Ammunition handling facilities—12-inch and 16-inch casemated batteries.* Studies of the facilities for the handling of ammunition in 12-inch and 16-inch casemated batteries indicate that the following modifications to the systems are necessary:

a. Shot tongs must be provided which will afford positive positioning of the projectiles under all operating conditions likely to be encountered.

b. Shell dogs should be provided for the tables on both sides of the power rammer, and the tables widened if necessary, so that three projectiles can be parked on either table. Only one table will be used for projectiles at any time, the other being used for powder.

c. The open spaces between the ends of adjoining sections of track of the overhead trolley system must be kept at a minimum consistent with requirements for expansion. This should be done by building up the ends by welding, and grinding them smooth, to close the spaces of those joints which are bad.

d. The adjoining ends of track of the overhead trolley system should be mutually supported by attaching pieces of steel to the under side of each section of track so that they lap each other.

e. Switches of the overhead trolley system should be

strengthened and provided with suitable supports in all batteries.

f. The trolley switch chain controls should be modified so that they hang on the side of the wall in as many cases as possible without interfering excessively with their accessibility to the operator.

g. All overhead trolley systems should be continuous track type, and care should be exercised to insure that all switches are installed so that the projectiles and empty hoists will not interfere one with the other.

h. The tracks of the overhead trolley system should be installed in all projectile rooms.

i. A loading table should be installed in the projectile room (the front room in 12-inch batteries). The capacity of the table should be at least five and not more than ten projectiles.

The Board has recommended that the modifications listed above be made on all 12-inch casemated batteries. For 16-inch casemated batteries, the modifications will be made first at a Virginia battery so that a final test of their suitability can be made by the Board. It is believed that these tests will be completed before the modifications are made in 12-inch casemated batteries.

The recommended basis of issue of trolley hoists and ammunition trucks is as follows:

	TRUCKS		HOISTS
	For Projectile	For Powder	
12-inch	8 per gun	8 per gun	10 per gun
16-inch (probable)	12 per gun	12 per gun	12 per gun

*Seacoast Target M10.* The Seacoast Target M9 has been reclassified as limited standard by recent Ordnance Department action. The M9 target has been modified extensively by the Ordnance Department in collaboration with the Coast Artillery Board. The modified target has been adopted as standard and designated the Seacoast Target M10. The M10 target has been made more seaworthy than the M9 by the addition of a third pontoon, high bows on the pontoons, stronger and much lighter superstructure, lower point of tow, and the use of marine plywood in the construction of the pontoons.

A tow line float of the clamp-on type has been designed and tested for use with the M10 target. This item is designated Float, Towline, M1.

A quantity of M10 targets is being procured and will be issued by the Ordnance Department as soon as available.

*Projectile stops on 16-inch Ammunition Trucks M4.* On numerous occasions the 16-inch Ammunition Truck M4 has tipped over, forward, dumping the projectile on the floor. This is due to the fact that the front wheels are approximately only 12½ inches forward of the center of gravity of the projectile in its normal position, while the projectile can slide forward approximately ten inches before the ogive contacts the front plate. The bump of the projectile against the front plate is usually enough to overcome the slight remaining stability of the truck and tip it forward.

The Ordnance Department has designed two stops, one for the 2100-pound and one for the 2240-pound projectile used in the 16-inch guns, to be bolted to the front of the ammunition truck so that they will contact the point of the windshield, allowing only one or two inches of longitudinal movement of the projectile.

As a result of a study of facilities for the handling of ammunition in 16-inch casemated batteries conducted by the Board in the early part of 1943, it was recommended that the Ammunition Truck M4 be provided with a brake of the type which could be installed and operated without causing the truck to tip forward. The Ordnance Department has stated that the provision of a brake is impracticable since it cannot be operated safely.

The Coast Artillery Board has recommended recently that the projectile stops discussed above be installed on Ammunition Trucks M4. The Board also recommended that, in view of the improved stability which will result from the addition of the stops, the Chief of Ordnance re-investigate the practicability of installing brakes on the Ammunition Truck M4. These recommendations have been approved by the Commanding General, Army Ground Forces.

*Labyrinth Dust Guard for 6-inch Barbette Carriages M1, M2, M3, and M4.* A new type metal dust guard has been tested recently by the Board. Tests were conducted comparing this dust guard to the old type felt dust guard. Each of the two dust guards was mounted on a 6-inch Barbette Carriage M4, and the tests were conducted concurrently.

After a period of about two months, no difference could be seen in the amount of dust that had been admitted by the two types of dust guards, and the amounts admitted were so small that both types are considered to be satisfactory in that respect. However, after having been installed for a short time, the felt dust guard had sagged or

expanded (or both) so that it wiped the racer. At the conclusion of the tests, the traversing handwheel efforts for both mounts were between eight and ten pounds, indicating that the wiping of the felt dust guard did not materially affect the torque. After a longer period than the two months used for the test, the torque may be seriously affected by this wiping. In any event, it is believed that the labyrinth dust guard will outlast the felt dust guard.

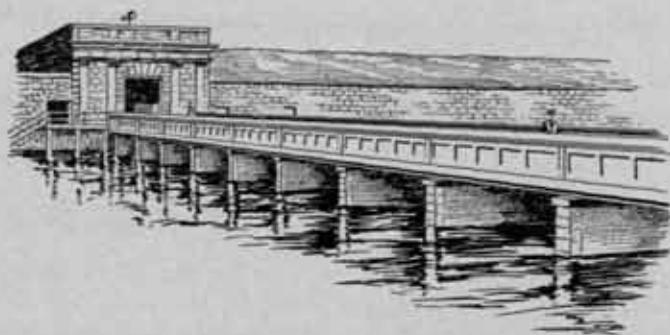
In view of the above, it has been recommended that the labyrinth dust guard, with minor modifications, be installed on all 6-inch Barbette Carriages M1, M2, M3, and M4.

*Recoil recorder for 6-inch Barbette Carriages M1, M2, M3, and M4.*

It is frequently necessary for troops in the field to determine the length of recoil when firing a seacoast gun. For this purpose, recoil recorders of local design are being used at the present time on the 6-inch barbette carriages listed above. It has been recommended that a field service modification work order be issued to provide for the installation of standard design recoil recorders on all 6-inch Barbette Carriages M1, M2, M3, and M4.

*Lubrication of gas check pads.* Section II, Circular No. 79, War Department, 1944, rescinds Section VIII, Circular No. 62, War Department, 1943, which reads, "Artillery weapons, 4.5-inch to 16-inch, inclusive—Care of artillery gas check pads.—1. When lubricating obturator gas check pads of artillery weapons, 4.5 inches to 16 inches, inclusive, in size, use oil, engine, SAE 10. Apply oil to pad and rub in well when the breech mechanism is disassembled for cleaning. Gas check pads will also be lubricated with this oil before packing for storage or shipment. 2. This circular supersedes such instructions to the contrary as may be contained in TM 9-350 and 9-456."

Since the instructions to use SAE 10 oil have been rescinded, the standard lubricant for gas check pads will be graphite grease, which was previously used.



# Coast Artillery Journal

*Fifty-third Year of Publication*

COLONEL E. B. WALKER, Editor

LT. COL. ARTHUR SYMONS, Associate Editor

MASTER SERGEANT CHARLES R. MILLER,  
Circulation Manager



The JOURNAL prints articles on subjects of professional and general interest to officers of all the components of the Coast Artillery Corps in order to stimulate thought and provoke discussion. However, opinions expressed and conclusions drawn in articles are in no sense official. They do not reflect the opinions or conclusions of any official or branch of the War Department.

The JOURNAL does not carry paid advertising. The JOURNAL pays for original articles upon publication. Manuscripts should be addressed to the Editor. The JOURNAL is not responsible for manuscripts unaccompanied by return postage.

## The United States Coast Artillery Association

### OFFICERS

MAJOR GENERAL J. A. GREEN

PRESIDENT

MAJOR GENERAL JOHN T. LEWIS

VICE-PRESIDENT

COLONEL E. B. WALKER

SECRETARY-TREASURER

### ADDITIONAL MEMBERS OF THE EXECUTIVE COUNCIL

BRIG. GENERAL DANIEL W. HICKEY, JR.

BRIG. GENERAL BRYAN L. MILBURN

BRIG. GENERAL LAWRENCE B. WEEKS

COLONEL FRANKLIN E. EDGECOMB

COLONEL FREDERIC A. PRICE

COLONEL E. B. WALKER

LT. COLONEL JOHN J. SPARKMAN



*The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of matériel and methods of training and by fostering mutual understanding, respect and cooperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.*

# News and Comment

## Election of Officers

The new officers of the United States Coast Artillery Association, elected by mail ballot, include:

Vice President: Major General John T. Lewis, USA

Members of the Executive Council:

Brigadier General Lawrence B. Weeks, USA.

Brigadier General Bryan L. Milburn, USA.

Colonel Franklin E. Edgecomb, CAC.

Colonel Eugene B. Walker, CAC.

These officers were elected for the 1944-45 term.

Major General Joseph A. Green's term of office as President of the Association runs to the end of this year, as do the terms of Brigadier General Daniel W. Hickey, USA, Colonel Frederic A. Price, USA (Ret.), and Lieutenant Colonel John J. Sparkman, CA-Res., as Members of the Executive Council.

## Group Subscriptions

Group subscription orders have not maintained their pace, with but six such orders received since the last issue. Captain John F. Keeton, adjutant of the 6th Coast Artillery, forwarded forty-nine subscriptions to put the 6th in the 100% class. An order of this size would be tops in any month, but it was not very far ahead of the 559th AAA AW Battalion, Lieutenant Colonel Thomas A. Baker, commanding, with forty subscriptions. Lieutenant Lowell E. Williams, adjutant of the 547th AAA AW Battalion, signed the letter which accounted for seventeen subscriptions for his organization.

Another 100% unit is Headquarters and Headquarters Battery of the 50th AAA Brigade, whose adjutant, Major William A. DePalo, sent in twelve subscriptions. Lieutenant D. N. Engelbrecht, adjutant of the 406th AAA Gun Battalion forwarded six subscriptions for organization within the battalion. Lieutenant Colonel E. W. Huddleston, commanding the 603d AAA Gun Battalion, signed the letter of transmittal for five subscriptions for organizations within his battalion.

## Panama Gun Mystery Solved

For the benefit of those readers who were left in suspense by the JOURNAL story on the scrapping of the 10-inch disappearing gun in Panama (Page 60, November-December, 1943), Lieutenant Colonel S. E. Hammersley, Ordnance Department has settled the question of whether or not the muzzle of the gun was cut off. Colonel Hammersley is on duty at Watervliet Arsenal, New York. He writes:

Watervliet Arsenal received orders for the manufacture of this gun on June 26, 1897, Lt. Col. Isaac Arnold, Commanding. The gun was completed under the command of Brigadier General Joseph P. Farley on November 25, 1902. Captain Otis C. Horney, as Inspection Officer, signed the inspection record from which these data were taken.

The original weight stamped upon the muzzle of the gun was 284,280 lbs. The gun was modified in January 1915 and October 15, 1917, which made it 220 lbs. lighter.

The original overall length of the gun was 590.90 inches. Service use almost without exception causes such cannon to elongate. When the gun was returned to Watervliet in January 1915 the gun measured 590.934 inches, an increase of .034 inches. Even such slight length changes are easy to detect by methods employed at Watervliet Arsenal. Measuring rods of known lengths and totalling slightly less than the gun's actual length are coupled together and allowed to remain in the bore to attain the same temperature as the gun. The few odd thousandths of the gun's length is then taken with the vernier depth gage and this measurement added to the total length of the length rod sizes. Thus a gun 600 inches long or more can be determined with an accuracy of a few thousandths of an inch.

Sixteen-inch Gun No. 1, Model of 1895, when it last left the Arsenal in October 1917 was actually longer than when it was manufactured, rather than being cut short at the muzzle as believed by some. The reputed loss in weight of this gun, reported as 17 tons, attends the once prevalent custom of denoting the cannon weights by "long ton" instead of a ton of 2000 lbs. Thus this gun weighing 284,280 lbs. could either be said to weigh 127 long tons or 142 short tons, a difference of 15 tons when compared with the actual poundage. This should solve the mystery of how the gun supposedly lost weight."

### Cross-Channel Gun Duels

For nearly three years the biggest guns in the world have been duelling at a range of more than twenty miles, hurling 1,500-pound shells to a height of 40,000 feet, far above the "spotting" aircraft. The duelling ground is the English Channel, the twenty-one mile wide strip of sea that has baffled invaders for centuries.

The duel began on August 22nd, 1940, although the Germans had previously fired a few "sighting" shots. For the first time in her history, Britain came under the fire of an enemy's land artillery.

Very soon British batteries hidden in the cliffs and folds of this part of Kent were replying and month by month their voices grew stronger. To the now familiar communique "German cross-channel guns fired last night" . . . was added in 1941 the words "and British guns replied."

Now it can be said that the Germans have lost the duel. Not only that. They have shown that if Britain is within big-gun shot of German-occupied France, then German-occupied France is within big gun shot of Britain. As the duel works towards its climax, British guns installed originally for defense and counter-battery work may be used for offense, putting down a barrage on roads and behind beaches.—*The Gunner.*

### Ballistic Correction Rule—Up to Date

Since Captain Wellington Yaple designed the Ballistic Correction Rule that was described in the November-December (1943) JOURNAL, certain changes have occurred in the firing tables mentioned.

To adapt the rule to the changed tables, it has been found convenient to place a table of corrections on the right side of the M-7 director and to combine the ballistic corrections as determined by the Ballistic Correction Rule with the appropriate firing table error.

The table of corrections follows:

Zone	Director M7			Director M7 and M9
	H-Altitude (yds)	dH Spot Correction to H (to nearest 10 yds)	dH <sup>alt</sup> Spot Correction to R (yds)	d Spot Correction to d (to nearest 2 miles)
2	200-500	-10	-200	0
3	500-1000	-20	-200	0
4	1000-1500	-30	-200	-2
5	1500-2000	-30	-200	0
6	2000-3000	-50	...	-4
7	3000-4000	-60	...	-2
8	4000-5000	-80	...	-2
9	5000-6000	-80	...	-4
10	6000-8000	-90	...	-2
11	8000-10000	-70	...	-2
12	10000-12000	-40	...	0

\*Use dH spot for "AA" fire and dR spot for "HOR" fire.

\*\*Use dH spot only when altitude converter is used for conversion of altitude to slant range. For fire using height finder for slant range determination, and for other equipment, used d%D spot.

In addition apply a fuse spot as follows: On Director M7, apply a spot of -0.1 fuse number.

### Subcaliber or Excaliber

For the benefit of those die-hards who still use the term "excaliber," there just isn't any such word in the military lexicon. A subcaliber gun is one mounted outside the tube of the larger gun; a subcaliber tube is one mounted inside the bore of the larger gun.



Alert at a Russian Naval AA position.

Scorfoto

### Care of Synthetic Tires

Practically all tires, tubes and tracks now rolling off the Akron production lines for Coast Artillery units and others are manufactured wholly or in part from synthetic rubber. Although synthetic rubber looks like natural rubber, and gives comparable performance when used correctly, some of its characteristics are so different that a modification of time-honored installation procedures is imperatively required.

To meet this situation, the Office of the Chief of Ordnance has just published a Technical Bulletin initiated by the Maintenance Division, A. S. F., and is preparing a comprehensive Technical Manual on synthetic tires which will follow at a later date. The new Technical Bulletin reviews standard operating and maintenance practices emphasizing that correct inflation and careful driving are more important than ever, and then presents the urgently modified synthetic tire installation procedure following:

"Rims must be thoroughly cleaned before installation. All grime, grease, grit, scale and rust must be removed. Scale and rust especially can seriously damage a synthetic rubber tube.

"Inspect casings inside and out carefully for nails, glass, cuts, breaks and rough spots. Even small breaks, cuts or rough spots will chafe a synthetic tube. Clean the inside of the casing thoroughly before installation.

"When inflating a synthetic tube before inserting it in the casing, do not inflate beyond a point where it rounds out. Synthetic tubes are not as elastic as natural rubber tubes and will be weakened, or even rupture, if care is not exercised.

"Synthetic tubes do not slip into position as readily as

natural rubber tubes. For this reason, it is imperative the tube be completely dusted with talc or soapstone before installation.

"When inserting a synthetic tube, care should be exercised to have the tube as evenly and correctly placed in the casing as possible.

"When flaps are used, they must be dusted with talc or soapstone and they must be installed carefully so that they are well centered and free from wrinkles.

"When tires are mounted on a drop-center rim, be sure the tire beads are out of the rim well before inflating. If they aren't, the tube may pinch and tear.

"Inflate tube partially to pull tube and casing into approximate position. Then deflate tube to ease local strains and permit tube to readjust itself. Then inflate to proper pressure. *This new two-step inflation procedure is of vital importance.*"

To enable Coast Artillery and other military personnel to know when to apply this new procedure, the Bulletin gives the following instructions for identifying synthetic rubber:

"Tires—A red circular spot bearing the letter "S" and a number shows that synthetic rubber is used.

"Tubes—A red or blue stripe completely around the circumference of a tube shows that it is made of synthetic rubber.

"Tracks—A red spot on a track shows that synthetic rubber is used.

Although manufacturers have made astronomical gains in synthetic rubber production, the tire shortage remains critical throughout this year. All enlisted and commissioned personnel concerned with the installation, operation and maintenance of tires, particularly personnel in Anti-aircraft Mobile Units, can help the situation tremendously. They can do this by studying and applying the instructions in the new Technical Bulletin, which is known as TB-31-200-1, *Maintenance and Care of Pneumatic Tires and Rubber Tracks Manufactured from Synthetic Rubber*; and the standard instructions on operation and maintenance of tires in TM 31-200, *Maintenance and Care of Pneumatic Tires and Rubber Treads*.

\* \* \*

### German Coastal Defenses in Norway

(Translated at the Command and General Staff School from an article in Die Wehrmacht.)

For months the English press has been discussing the question of whether Norway is a strong or a weak link in the defense of Europe. The pros and cons are equally balanced, but repeatedly the warning voice of those in a position to know are heard, calling attention to the defensive strength of the 200,000 rocky islands and cliffs of the Norwegian coast.

For forty months German soldiers have been stationed there, silently waiting. In a total of 1200 days of hard labor they have built fortresses on the inhospitable islands, large and small. Many of the islands lie uninhabited in the coastal forefield. No ship will be able to go past them unmolested. When the enemy attacks Norway he must capture the rocky islands off the important fjord. Naval artillery and bombers will have little effect against



British Official Photo

Members of a British mixed AA battery inspect fragments of a German plane they brought down over London, January 29th.

the Norwegian rock which is much harder than the rock of Gibraltar.

During the preparatory bombardments, the defending crews can remain safe in their shelters and casements deep in the rock. Then, as soon as the firing ceases and the landing boats of the enemy approach, comes the crucial moment for which the crews have been prepared by means of numberless practice exercises. The soldiers have learned to leave their rocky bunkers in a matter of only a few seconds, and they know by heart the distances in their field of fire. They are able to find their way in the labyrinth of subterranean passages, for they know accurately the way leading to all the positions. Lastly, they also know that enough ammunition, drinking water, and food are stored in bombproof magazines to last them even in case of a long blockade of the island.

The life of the crew of one of these island positions is hard and monotonous. Fortifications are never finished. Minefields must continually be changed and positions improved. The soldiers find relief from loneliness by means of the radio or the infrequent arrival of mail from home.—*Military Review*.

### Army Branch Chiefs

Further steps toward the de-emphasis of the Army's arms and services were taken this week when Maj. Gen. John F. Williams was assigned as "acting" chief of the National Guard Bureau and it became evident that Maj. Gen. Virgil L. Peterson will be continued as "acting" Inspector General when his tour as The Inspector General expires 27 Feb.

General Williams' tour as Chief of the National Guard Bureau expired 30 Jan. In both his case and that of General Peterson, the administration elected to have them nominated as temporary major generals rather than submit their renominations as chiefs of their branches for the regular four-year tour of duty as provided by the National Defense Act.

Under these conditions these two branches will have no permanent chiefs, only "acting" chiefs. From the War Department's view this leads to greater flexibility, for it permits them to shift officers in and out of the jobs without going to Congress for nomination and confirmation. It also would seem to lead to a further subordination of the branches.

It will be recalled that five branches already have been abolished insofar as concerns their having a specific chief as defined in the National Defense Act. These branches are the Infantry, Cavalry, Field Artillery, Coast Artillery and Air Corps. Legally, Maj. Gen. C. H. Hodges is still Chief of Infantry, his tour expiring next year; Maj. Gen. Joseph A. Green is chief of Coast Artillery until April, 1944, and Lt. Gen. George H. Brett, Chief of the Air Corps until October, 1944, but all have been assigned to other duties, and the office of the chief of arm in each case abolished.

A somewhat similar situation exists with respect to the office of Chief of Staff of the Army, for the four year tour of General George C. Marshall expired last Fall and he

has not been renominated either for that post or for the temporary rank of general which accompanies it. However, in his case the National Defense Act merely says that the tour shall be four years in time of peace, thus leaving room for legal interpretation that it can be extended indefinitely in time of war.

This continued de-emphasis on the arms and services is believed to grow out of the organization of the three administrative divisions—Army Ground Forces, Army Air Forces, and Army Service Forces, each of which has jurisdiction over certain of the branches—or former branches. In each instance the tendency is to put greater and greater emphasis on the newly created Force and less and less emphasis on its constituent arms and services.—*Army and Navy Journal*.

### "Motor Unfitness"

An "appalling" number of young men entering college suffer from "motor unfitness," tests at the University of Illinois show. The tests and their results are reported by Dr. Thomas K. Cureton, of the University's School of Physical Education, in the *Journal, American Medical Association*.

Motor fitness, he says, means "capacity to run, jump, dodge, fall, climb, swim, ride, lift and carry loads and endure long hours of continuous work." Vitaly necessary to the soldier, motor fitness is also needed by civilians for their safety and health, Dr. Cureton points out.

Protected soft lives, dependence on motor vehicles, inefficient physical education, and lack of hard physical work are blamed by Dr. Cureton for the large number of men who enter college with motor unfitness.

Tests developed at the University of Illinois to rate students on motor fitness include ability to balance on one foot or toe for ten seconds; ability to do twenty leg lifts and twenty situps in succession; ability to lift and set down once a person, one's own weight; ability to do a standing broad jump of seven feet.—*Science News Letter*.



Jap gun blasted on E nubuj, in the Kwajalein Atoll.

Press Association Photo

### Officer Candidate Schools

Four additional officer candidate schools are closing, the War Department has reported.

The Cavalry Officer Candidate School, Ft. Riley, Kans.; the Coast Artillery (OCS) Ft. Monroe, Va., and the Tank Destroyer (OCS), Camp Hood, Tex., accepted their last classes in December, 1943. The last class entered the Anti-aircraft Artillery (OCS), Camp Davis, N. C., on 1 Feb.

Officer candidate schools whose closing previously was announced were: Adjutant General, Ft. Washington, Md.; Quartermaster, Ft. Warren, Wyo.; Medical Administrative, Carlisle Barracks, Pa.; Army Administration, Fargo, N. Dak.; Grinnell, Iowa, Gainesville, Fla., and Ft. Washington, Md.

The closings leave 15 schools in operation, all under reduced quotas. Moreover, these reduced quotas are for some schools largely taken up by R.O.T.C. graduates. However, the remainder of the R.O.T.C. are expected to be through the schools by early summer.

Indicative of the reduction in quotas generally is the report of the War Department this week that the number of graduates in January, 1944, is estimated at 2,500 to 3,000. At the peak of the OCS program in December, 1942, more than 23,000 officers were graduated.

The officer candidate schools still in operation are:

1. Armored Force, Ft. Knox, Ky.
2. Army Air Force, Miami, Fla., and Harvard U.
3. Chemical Warfare, Edgewood Arsenal, Md.
4. Corps of Engineers, Ft. Belvoir, Va.
5. Field Artillery, Ft. Sill, Okla.
6. Finance, Duke University.
7. Infantry, Ft. Benning, Ga.
8. Judge Advocate General, Ann Arbor, Mich.
9. Medical Administrative, Camp Barkeley, Tex.
10. Corps of Military Police, Ft. Custer, Mich.
11. Ordnance, Aberdeen, Md.
12. Quartermaster, Camp Lee, Va.
13. Signal Corps, Ft. Monmouth, N. J.
14. Transportation Corps, New Orleans, La.
15. WAC, Ft. Oglethorpe, Ga.

In addition, there is an overseas OCS in Australia. The school in England and two other officer candidate schools formerly maintained at undisclosed locations overseas have been closed.

A revision of AR 625-5, the Officer Candidate School regulation, is being drafted.—*Army and Navy Journal*.

/ / /

### German East Wall Defenses

According to neutral correspondents in Vienna, German officials there are saying that their High Command hopes to keep most of its military reserves for a resolute stand on the *Ostwall*—the line of forts on the German side of the central Bug, which marked the German-Soviet boundary of September, 1939. Indirect reports are not always to be trusted, but this one seems to be supported by evidence of recent building work along the line. A large number of Todt Organization workers are there, and many trains have taken materials for mixing concrete to the district.

The defense seems to be planned in depth; it is not so much a line as an area. In the Zamosc district alone, a few miles to the west of the river, more than 50 Polish villages were emptied of their people some months ago and about 10,000 farmers were moved from their lands. Although many of the men were sent to Germany and others into Russia, a large number were put to building defenses near at hand. From other districts come much the same reports, adding up to form a picture of a wide defense area.

The *Ostwall* was first given its name by the Germans in 1940 when Dr. Todt began work upon it. A short time before the German armies invaded Russia he inspected the strong points and pillboxes so far as they had been built.

To their own people the German authorities proclaim day by day that they can hold what they call the European inner fortress, stretching from the *Ostwall* to the Atlantic coast. At best this could be only a short-term policy, for—quite apart from the overwhelming force that will move forward from the west as well as from the east to destroy all defensive planning—the so-called "inner fortress" has not the raw materials to supply itself in total war.—*London Times*.

/ / /

### American AA Unit Defends London

General Sir Frederick Pile, G.O.C.-in-C., Anti-Aircraft Command, disclosed yesterday that an American AA unit is in London training by day and helping to defend the city by night. He also announced that the AA demonstration battery which recently returned from a six months tour of United States Army camps is also being brought in to augment the defenses of the capital.

Sir Frederick Pile was speaking at the Mansion House, where the seventeen officers and 329 other ranks of the demonstration battery were entertained by the Lord Mayor (Sir Frank Newson-Smith) and the Lady Mayoress.

The anti-aircraft defense of a city as congested as London was not easy, General Pile said. It was difficult to find open sites suitable for emplacing guns. One site on the Isle of Dogs, perhaps the most bombed site in the world, was manned during the winter of 1940-41 by a unit which had since seen much overseas service and was now fighting the Japanese. On one occasion this site was so ringed by bomb craters that it could not be reached by a Royal Signals lorry carrying men and equipment to restore communications.

A general officer of the United States Army, who was among a number of American guests present, said the American AA unit referred to by General Pile appreciated the honor of being probably the first foreign unit taken into the defense of the City of London.—*London Times*.

/ / /

### The "Piat" Antitank Gun

New York, Jan. 30 (AP).—A 33-pound infantry weapon called the "Piat," which can pierce four inches of the finest armor plate with the power of a 75mm gun, has been knocking out German tanks and pillboxes in Italy for some time, the British Information Service disclosed tonight.

This newest British tank buster, which is not to be con-



Loading the weapon.



A direct hit on a tank.

British Official Photos

used with the famed American "Bazooka," although its purpose is similar, is easily carried by one man and can be brought into action in a few seconds. It fires a two and three-quarters pound bomb, but its weight is actually two pounds less than that of the old antitank rifle.

A spring mechanism insures so light a recoil that the Piat can be fired from the shoulder. Infantrymen using it in that fashion, with the forepart of the weapon rested, have been trained to hit a moving tank at a range of 100 yards.

This weapon, called "Piat" from the initials of its official name, "Projector Infantry Anti-Tank," can fire a number of bombs in quick succession. With the butt placed on the ground to give elevation, German transport, machine-gun nests and similar targets have been knocked out at ranges up to 350 yards.

Canadian troops, using the "Piat" in tough, close fighting in Italy, have employed it with lethal effect, it was disclosed, and one British division piled up an impressive record with it against pillboxes.

Recent reports indicate that the "Piat" can account for the heaviest German tanks.

### Background for the Italian Campaign

Algiers may not be the place where one would choose to live and work at the present moment, but it is only there that one can realize the results of General Eisenhower's policy and understand fully the regard in which he is held. The accounts published at home of the integration of the staff and through it of the British and American efforts are not a whit exaggerated. Both sides bring their contribution to the machine. The British may have the deeper experience and strong habits of exactitude in planning and execution, but the American approach to any given problem is more direct and objective. The American staff system, which was instituted by General Eisenhower and is to be continued under General Maitland Wilson, is also simpler and quicker. The combination is excellent, but it could have been achieved only in the case of two nations speaking the same language and with strong affinities in outlook, and, despite all the well-meant warnings one hears about differences in national character, British and American affinities are in fact very close.

This command now stretches right to the eastern end of the Mediterranean for the first time, but I shall confine myself to the framework of the Italian campaign. The combination extends across the water into the Italian theater, especially perhaps in the services, where two well-equipped expeditionary forces, each with its own particular strong points, interlock and supplement one another. To take one example, the Americans have no railway construction companies—only maintenance sections in their operating companies. It has been found that their reliance on sufficient field engineers being available is misplaced; and our construction companies have been invaluable. On the other hand, we have no organization equivalent to their pipe-laying companies, whose brilliant work has already been recorded in the Press.

In general one gathers the impression that the Americans, with little but theory to work upon because their small peacetime army consisted mainly of training cadres, have made a remarkably good job of their equipment problem. They have not been obliged to look back as often as we have; and if they have had to scrap certain types, that is a comparatively minor incident. Their transport is standardized and homogeneous, which means economy in maintenance. This standardization applies also to the powerful French Army, which has now almost completed its equipment with American material. The artillery of all calibers is first-class.

The problems now being faced in Italy are very different from those of the Tunisian campaign. There that of sea traffic became secondary after the initial stage. Munitions were poured into Algeria. The bottle-neck was a long railway system, designed not to take heavy coastwise traffic but as a link between a series of more important railways running from the interior to the ports. Now the allied army group in Italy is concerned with shipping and ports, especially ports. We have Brindisi, Bari, and Naples; but the two former are already a long distance from the front, and there is no first-class port for a very long way ahead, until Ancona is reached on one coast and Leghorn on the other. (Civitavecchia has only a very limited capacity.)—*London Times*.

## Lethbridge Mission Reports

G.H.Q., India, Dec. 31.

Much valuable information about the war against Japan has been gathered by the military mission under Major General J. S. Lethbridge, which recently arrived in India after an extensive tour of the battle fronts in the southwest Pacific.

The mission has already seen enough to put forward recommendations to the chiefs of staff in London and Washington concerning the tactics and equipment best suited to fighting the Japanese, in order that there shall be no undue time lag after the defeat of Germany in mounting a full-scale allied offensive in the East. The picture will be completed within the next few weeks by a detailed survey of the operational areas and training establishments in the Indian theater. It became apparent a long time ago that the allies had a good deal to learn about fighting Japan, and that many modifications in training and equipment would be necessary.

The Lethbridge mission was therefore formed, and to the original British members representing the three fighting services were later added a few American and Canadian officers. They were given wide terms of reference, to the exclusion of strategy and intelligence, and began by spending many weeks in Britain, the United States, and Canada at various centers of research and development.

General Lethbridge has come away with no high opinion of the Japanese, whom he describes as stupid and easily rattled by surprise, words that bear out General Wingate's experiences in Burma last spring. They have been surprised time and again by the Australians, who, General Lethbridge stated, have adapted themselves to jungle warfare in an extraordinary way, and in the New Guinea operations have killed ten times the number they have lost. The Japanese soldier, however, has the two great military virtues of fighting to the end and being able to live on much less than the allied troops. Near Finschafen General Lethbridge saw the bodies of 200 Japanese who had jumped from a 200 foot precipice rather than be taken prisoner.—*London Times*.

## Policy for Airplane Names

A long-range policy for the naming of military aircraft, designed to insure uniformity, simplicity and meaning in the names of American-built warplanes being used by the U. S. services and by the United Nations, has been adopted by the Joint Aircraft Committee.

Names adopted in future will follow this scheme, as laid down by the Committee:

Fighters: Names indicating speed, maneuverability, fighting characteristics or aggressiveness.

Bombers: Names indicating size, weight, power, range or destructive characteristics.

Patrol Types: Names employing seafaring terms.

Transports: (Cargo and Personnel) Names implying transportation, range or load-carrying ability.

Trainers: Names employing tuition terms, educational institutions or places of training, but not names of military or naval establishments.

Miscellaneous: Names indicating the primary operational functions of the aircraft.

The names currently in use, as approved by the Committee are:

BOMBERS		Model Navy	Approved Name
Original Designer	Army		
Boeing	B-17		Fortress
Douglas	B-18		Bolo
Douglas	B-23		Dragon
Consolidated	B-24	PB4Y	Liberator
North American	B-25	PBJ	Mitchell
Martin	B-26	JM	Marauder
Boeing	B-29		Superfortress
Vega	B-34	PV	Ventura
Douglas	A-20 (P-70)	BD	Havoc (Boston)*
Douglas	A-24	SBD	Dauntless
Curtiss	A-25	SB2C, SHW, SBF	Helldiver
Lockheed	A-29	PBO	Hudson
Martin	A-30		Baltimore
Vultee	A-31, A-35		Vengeance
Brewster	A-34	SB2A	Bermuda
North American	A-36 (P-51)		Mustang
Grumman		TBF, TBM	Avenger
Consolidated	OA-10	PBY, PB2B, PBN	Catalina
Consolidated		PB2Y	Coronado
Martin		PBM	Mariner
FIGHTERS			
Lockheed	P-38		Lightning
Bell	P-39		Aircobra
Curtiss	P-40		Warhawk (Kittyhawk)*
Republic	P-43		Lancer
Republic	P-47		Thunderbolt
North American	P-51 (A-36)		Mustang
Northrop	P-61		Black Widow
Douglas	P-70 (A-20)		Havoc (Boston)*
Vought-Sikorsky		F4U, FG, F2G, F3A	Corsair
Grumman		F6F	Hellcat
Grumman		F4F, FM	Wildcat
LIAISON			
Taylorcraft	L-2 (O-57)		Grasshopper
Aeronca	L-3 (O-58)		Grasshopper
Piper	L-4 (O-59)	NE	Grasshopper
Vultee	L-5 (O-62)	OY	Sentinel
OBSERVATION			
Vultee	O-49		Vigilant
Curtiss	O-52		Owl
Lockheed	O-56 (B-34)		Ventura
Taylorcraft	O-57 (L-2)		Grasshopper
Aeronca	O-58 (L-3)		Grasshopper
Piper	O-59 (L-4)		Grasshopper
Vultee	O-62 (L-5)		Sentinel
Curtiss		SO3C	Seawren
Vought-Sikorsky		OS2U, OS2N	Kingfisher
TRANSPORTS			
Beech	C-43	GB	Traveller
Beech	C-45	JRB	Expediter
Curtiss	C-46	R5C	Commando
Douglas	C-47	R4D	Skytrain (Dakota)*
Douglas	C-49, C-53	R4D	Skytrooper (Dakota)*
Douglas	C-54	R5D	Skymaster
Lockheed	C-56, C-60	R5O	Lodestar
Fairchild	UC-61	GK	Forwarder (Argus)*
Howard		GH	Nightingale
Lockheed	C-63 (AT-18) (A-29)		Hudson
Curtiss	C-76		Caravan
Cessna	UC-78 (AT-17)	JRC	Bobcat
Consolidated	C-87	RY	Liberator
Vought-Sikorsky		JR2S	Excalibur
Grumman		JRF	Goose
Grumman	OA-9	J4F	Widgeon

\*Names contained within parentheses under the heading "Approved Name" are designations adopted previously by the British and used in their official records, publications and communications.

## Ancient Incendiary Attack

Stockholm, Jan. 3.

Reports from Berlin say that the ancient town of Korosten, which has figured many times in Russian history during the past ten centuries, was little more than a heap of ruins when the Germans once more abandoned it.

The first recorded demolition of Korosten took place about the year 946, when Olga, widow of the famous Igor, princess of Kiev, took a terrible revenge on the *Drevlyany*, or tribe of forest dwellers, for the killing of her husband. Tired of a long, futile siege, Olga offered the *Drevlyany* peace if they would send her one pigeon and one sparrow alive from every house in Korosten. The terms were accepted, but at that time Olga, who had learned the incendiary trick from the Greeks, released the birds each laden with an incendiary preparation of phosphorous, whereupon the homing suicide birds set the whole Korosten ablaze. Thus Korosten became the first town in history to be raided from the air and destroyed by incendiary phosphorous bombs.—*London Times*.

\* \* \*

## German Air Tactics in Russia

(Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Lieutenant Colonel N. Denisov, Soviet Army, in *Krasnaya Armia* 12 June 1943.)

Recent German bombardment aviation tactics reveal a tendency to employ heavy massed blows delivered simultaneously on a narrow sector of the front by numerous groups of aircraft. Striving to achieve surprise by means of a maneuver, the Germans occasionally employ independent bomber raids without accompanying fighters. In connection they have changed several times the compositions of their bombardment groups. Typical at the present time is a group of Junkers or Heinkels consisting on the average of thirty to forty planes, flying in a compact formation. Depending on the nature of the target (the area occupied) these groups fly either in wide formation or in echelon, nine to twelve aircraft in each group. In some instances the number of bombers in the group is increased to sixty or eighty.

Quite evidently this method has been adopted because of the activity of our fighters who in large aerial battles tie up the principal part of the German fighter aircraft. Therefore the enemy is trying to compensate for the lack of fighter support by increasing the number of his bombers. These flights are organized on the principle of close mutual support between the individual aircraft and the groups. It is not an easy matter for our fighters to break up the compact formation of a large number of bombers into small groups in order to destroy them in detail. However, experience shows that through the correct conduct of combat it is possible to handle these large groups.

In one battle, events took place as follows. At first our fighters encountered thirty-five Junkers. Approaching the target, these enemy aircraft took up a column formation with no more than 100 meters between the elements of the formation. Leaving a part of his fighters for protec-

tion, Major Shmelev led the assault group into the attack. Inasmuch as the German combat formation was spread out, our aircraft attacked the enemy in pairs, in several places simultaneously. Firing their machine guns at short distances, our planes forced the Germans to swerve, deploy, and turn back. Our air patrol pursued the enemy until the entire Junkers group was completely dispersed.

Several minutes later thirty more German aircraft appeared in the same vicinity. They flew in a close, compact formation. Since he was below the Germans, Major Shmelev and his group gained altitude, and then with the combined forces of his patrol he attacked the very center of the German combat formation. This concentrated blow immediately disabled several hostile aircraft. The Germans began to lose their mutual fire support and several minutes later were forced to disperse, even coming down to low level flight. During the pursuit several additional German aircraft were shot down. This double victory over strong groups of bombers is distinguished by the fact that Major Shmelev's patrol consisted of only a few fighters. Their success was the result of tactically correctly executed attacks, short range fire, and wide employment of the vertical maneuver.

Recently, German bombardment aviation engaged over the battlefield has been employing small groups of planes which rather frequently attack our ground troops from low altitudes or grazing flight. For this purpose the Germans employ their somewhat modernized Junkers 87 which has been called by them the "antitank plane." This plane carries two automatic cannon and its speed has been increased to 320 kilometers per hour. Its range also has been increased. These attacks call for countermeasures by our aviation and antiaircraft defense, including the method of "barraging" of air patrols at low altitudes. Our Ilyushin-2 planes, whose fire power is great, are employed for fighting the German assault planes. At the same time all the infantry fire elements participate in action against low-flying enemy aircraft.

The German tendency to employ aviation in mass is expressed not only over the battlefield. During recent times the majority of air attacks on our lines of communications, railroad junctions, and cities, has been by successive raids by heavy bombardment forces. In the daytime the Germans fly in echelons of as many as 100 planes and sometimes even more, at night they fly either in small groups flying individually or one behind the other. Large forces are sent against the principal targets.

Participation of strong enemy air forces in these raids places a number of responsible tasks on all the elements of our antiaircraft defense, requiring a well organized system of antiaircraft fire, cooperation between antiaircraft artillery and fighter aircraft engaged in the defense of the given objective, cooperation with neighboring elements, active and aggressive tempo of aerial combat, skilful command, and timely increase of forces from available reserves. To repel a raid by German bombers on a city or a railroad center is not just one short battle. Frequently it is a major engagement—lasting uninterruptedly for several hours.—*Military Review*.

### Troop Rotation Plan

More than 200,000 troops, exclusive of sick and wounded, have been sent back to the United States from overseas areas since the beginning of the war, the War Department has announced.

Some of the personnel were sent back to the United States under the policy of rotation which is essentially the exchange of men in overseas theaters for replacements furnished from the United States in accordance with advance requisitions submitted by theater commanders.

"Each theater commander will prescribe for his theater the period of service which will render individuals eligible for consideration for rotation," the War Department stated. "It must be understood that eligibility does not bestow the right to be relieved from an overseas theater, but only establishes a basis for selection, the actual relief being dependent upon the personnel situation, exigencies of the service, and prosecution of the war."



### Combined Allied Training

United States Army Ordnance and Quartermaster units in Great Britain are exchanging personnel with similar British Army units for coordination of training against the day they team together in the assault on Western Europe.

Designed to familiarize each force with the other's methods of supply, the plan provides for American officers and men to spend two-week orientation periods at British installations, and for American installations to play host to British Army personnel for similar periods. The Americans and British live, work and mess together, and engage in the same recreational activities.



### Searchlight Training Program

Experienced antiaircraft searchlight battalions will be trained to cooperate with fighter planes in combined air defense under a new training program.

Each month one or more battalions which have completed their usual period of approximately four months in training centers will be assigned to the Army Air Forces for combined instruction in lighter-searchlight procedures.

The course will last approximately two months and will be conducted at the Army Air Forces Tactical Center, Orlando, Florida. In addition to providing realistic experience for searchlight crews, the program also will enable Air Force units to gain knowledge of the benefits to be derived from friendly searchlights.

Searchlight units which have completed their training and are no longer required at Orlando or in the continental limits of the United States will be returned to the control of the Army Ground Forces.

### AAA Barrage Problems

London, March 25.—The terrific concentration of anti-aircraft power reached by London's antiaircraft defenses during recent raids has brought with it new problems, say special civilian "recorders" stationed at every gun site.

All of them highly trained physicists, the recorders are called into action with individual batteries to observe their efficiency, note any specific problems and suggest improvements. Their findings are brought before an antiaircraft command court of inquiry, where remedies are immediately instituted.

At a recent inquiry, for instance, the increasingly enormous blast effects on gun sites were discussed.

"I was holding a stopwatch when one salvo was fired," said a recorder. "The hands of the watch jumped six seconds with the blast."

Others told of men made stone deaf, of bleeding ears and noses, of burst locks on doors, and broken electric systems. Nothing as intense as this had been experienced in previous barrages, but the recorders reported that the men and women on the gun sites continued their work as usual. Measures—which must remain secret for now—were taken at once to relieve blast effects.

Some of the difficulties arose because new equipment was being installed when the blitz returned to London. Although members of the Royal Electrical and Mechanical Engineers worked day and night, before and during raids to complete the vital installations, the gunpits still filled with suffocating fumes from the hundreds and hundreds of rounds fired from a single site in one night.

"At my site," he added, "two men nearly collapsed, others became violently sick and still others tied wet handkerchiefs over their faces. The handkerchiefs became jet black in a few minutes."

Discussion revealed that a ventilation system to cope with the more powerful weapons was part of the new equipment as yet not completed. A staff officer was appointed to see that the situation was remedied the same day.

Precision is not one of the problems of London's defenses, said the recorders—and they should know, for they work with secret apparatus which enables them to check on the accuracy of every shell fired. The defenses have improved so greatly that the guns are now bringing down eight German planes with the same number of shells taken to shoot down one in 1940.

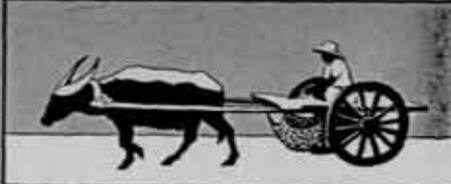
In addition, the recorders said, firing discipline is even higher than in the previous blitz.

"In the last raid," said a recorder, "we got the first salvo into the air only 2 minutes and 37 seconds after the order 'Take-posts.'" —*Washington Post*.





# Corregidor



BRIGADIER GENERAL GEORGE F. MOORE, U. S. Army,  
Commanding Philippine Coast Artillery Command

By Lieutenant Burton R. Brown

Change of command designation, tragedies, near tragedies, celebrations, and distinguished visitors have been as much a part of Corregidor during August and September as the rain. Orders from Headquarters, United States Forces in the Far East, have created the Philippine Coast Artillery Command with Brigadier General George F. Moore as Commanding General. The Harbor Defenses of Manila and Fort Mills are part of this command and Fort Mills is the headquarters.

The Harbor Boat Club... of trips from Fort Mills... the past quarter of a... morning of... to Fort Mills she... rolled over on... few minutes... Wint in fifty... work on... of all except... time of ac... Hultquist... F. W. B... when they v... down... they managed... boat. For two... kept afloat... before th... By slow stage... while, the ass... our own harbor boats w... missing boat. The survivors v... beach by a destroyer on the... and a small boat was sent as... for them. All survivors... have now completely recovered and have rejoined the busy round of work at Corregidor.

A month after this near-tragedy part of the post engaged in a celebration when Colonel P. D. Bunker's regiment celebrated its twenty-third anniversary. It was especially gratifying to Colonel Bunker since this is the third time he has commanded this regiment and is justly proud of it. Lieutenant Colonel Valentine P. Foster, who was with this organization at its inception and served with it all during World War I in France reviewed the history of the regiment from his own personal experiences with it. General Moore, who in one of his previous tours at Corregidor, had also served in

the regiment, complimented the regiment on its past and present achievement. On this same occasion the newly authorized regimental band made its first public appearance.

On September 3d, Lieutenant General Douglas MacArthur, Commanding General of the United States Forces in the Far East, accompanied by Brigadier General... his Chief of Staff, made... Fort Mills... armament, in... Arthur having at... of the Philippine... Corregidor... but much... upon his de... vity but... ntly ap... and little... the vast... ing... been ac... ears, an ap... oor instruc... ers' In... e by batteries... ack and Lieuten... slackening of the... completely outdoors... ms and beach defense... tly all over the... craft... ine gun, and... being cond... ed by all regi... too early to comment on the record of... organization... but observation of the first firings... k well of the preparedness of Corregidor for any... eventuality in these lines. General Moore, just completing a quarterly inspection of all phases of the training and installations in the Harbor Defenses, noticed a vast improvement in all cases over that displayed in his last inspection.

Frequent "conditioning marches" under full pack are made by all units. During these marches the organizations engage in gas defense and extended order problems. The improved physical condition of the personnel is very noticeable. Meanwhile several officers and non-commissioned officers are detailed for a short time with the Philippine Army to assist in their training. During this same rainy season, Mine Command of Lieutenant Colonel Kohn's regiment has worked day and night, in

# I SHALL RETURN!

# MACARTHUR



## The Coast Artillery School

BRIGADIER GENERAL L. B. WEEKS, *Commandant*

Early in the morning of St. Patrick's Day nearly thirty candidates from Class 31 of the Seacoast Artillery Officer Candidate School filed up on the stage of the Fort Monroe Theatre to receive from Brigadier General Lawrence B. Weeks their commissions as 2d Lieutenants in the Army of the United States.

In all outward appearances, the candidates of Class 31 were no different from other candidates who had entered OCS at Fort Monroe as earnest but bewildered aspirants to a commission and had left here wearing new gold bars. But the candidates of Class 31 had one distinction. They were the members of the final class to graduate from the Seacoast Artillery OCS, which was recently suspended.

Between April 20, 1942, when Class 1 began the study of Seacoast Artillery, Army administration, mess management, and allied subjects and March 17, 1944, when Class 31 was graduated, several thousand candidates had been detailed to the School.

The percentage of men who failed to complete the course was nearly 19.6%. Most frequently found reason for relieving a candidate from the School was academic failure. Physical deficiencies and lack of military bearing followed next in order.

Like instructors in other educational institutions, the men who guided OCS through its two-year history here at the Coast Artillery School have followed the careers of its graduates with interest.

"We have had very encouraging reports on the many officers we have graduated," Major Berry declared in commenting on the graduation of the final class. "Commanding officers everywhere in the field report the OCS graduates are doing a fine job. They are serving in every part of the world where Coast Artillery units are stationed and, to further demonstrate the thorough training they have received here, many are making good in branches other than the Coast Artillery Corps."

A course designed to train officers from rapid-fire batteries in the operation and care of the M9 Director has been instituted at the School. The course runs for ten days and is under the supervision of Captain Karl G. Baresel of the Data Computer Section of the Department of Enlisted Specialists. Group No. 1 was graduated 2 March.

A new course to train enlisted men as diesel engine power plant operators has been authorized. This course, which will be offered by the Department of Enlisted Specialists, will run for ten weeks. The course will be repeated every four weeks. Graduates will be qualified to operate and maintain modern diesel engines in recently installed modern seacoast artillery batteries.

The long awaited arrival of a contingent of WACs to relieve enlisted men at the School for active duty has finally materialized. At the time this article was written a cadre of a dozen WACs under Captain Margaret L. Philpot had arrived and taken up duties at the School in preparation for the arrival of additional enlisted women.

A miniature artillery spotting range has been developed by the Department of Artillery as an aid in training personnel engaged in the position finding and spotting elements of a battery. At present a model of the range is being used in class work at the school and a Coast Artillery Training Bulletin, explaining the operation of the board and how it can be constructed within the battery, is being prepared for distribution to troops in the field.

The spotting range consists essentially of a table mounted on rollers, the top of the table containing a series of drilled holes and a pulley system for moving a small model target across its surface. The table top can be constructed of sheet wall board or plywood about 8 feet long and 5 feet wide and should be mounted about 3½ feet above the ground.

In training spotters to sense range deviations the table is usually kept in a stationary position and the target manipulated across the board by means of the pulley. At intervals the operator of the board inserts "splashes" (pieces of cotton wrapped around a wooden peg) through holes in the table top. The actual deviation of each hole from the target is worked out before operation and thus can be checked against the deviation read by the spotter sighting through an azimuth instrument.

In training spotters to sense lateral deviations, the whole table is rolled along the ground with the target remaining stationary in the center. At intervals the operator of the board places the splashes over the desired calibrated holes by means of a handle and holds them stationary while the table and the target move away.

Field Manuals and Technical Manuals, prepared by the Department of Training Publications, which will soon be published include FM 4-5, *Tactics* (revision); FM 4-10, *Gunnery* (revision); FM 4-19, *Examinations for Gunnery*; FM 4-20, *Firing Precautions, Safety Precautions, Care and Service of Matériel*; FM 4-25, *Service of the Piece, 155-mm Gun (G.P.F.)*; and TM 4-237, *Instructions for the Use of Radio-Controlled Target Boats by Seacoast Artillery Units*.

A series of nine film strips was recently completed by the Department of Training Publications on *Communication for Seacoast Artillery*. This series includes: Part I, *The Use of the Telephone*; Part II, *The Laying of Field Wire*; Part III, *The Standard Field Splice*; Part IV, *The Local Battery Telephone*; Part V, *Installation and Operation of Field Switchboards*; Part VI, *The BD-95 Switchboard*; Part VII, *The Fixed Harbor Defense Communication System*; Part VIII, *The Common Battery Telephone* and Part IX, *The Interval Apparatus and Signal Systems*.

Another series of film strips completed is entitled *Railroad Artillery* and includes Part I, *Track Construction*; Part II, *Turnouts*; Part III, *The 8-Inch Gun and Mount*; Part IV, *Railway Cars*; Part V, *Hand and Air Brakes*; Part VI, *Diesel-Electric Locomotives*, and Part VII, *Train Operations*.

A series on *The 6-Inch Gun on Barbette Carriage, M1 or M2* includes Part I, *The Carriage and Traversing Mechanisms*; Part II, *The Barrel and Breech Assembly*; Part III, *The Recoil and Counterrecoil Systems*; Part IV, *Elevation Mechanisms*, and Part V, *Sighting Equipment*.



BRIGADIER GENERAL BRYAN L. MILBURN, *Commandant*

By *Lieutenant Colonel Charles H. Scott*

The second-year stone in the short but lively history of the Antiaircraft Artillery School was passed in March. Due to the busy program conducted at the School, the anniversary almost passed unobserved.

It was in March, 1942 that the AAA School was established at Camp Davis. With the tremendous emphasis on air power in this war, it naturally followed that defenses against aerial attacks be vastly increased. Such was the urgent demand to build a huge aerial defense force that it was found necessary to move the AAA School from its parent, the Coast Artillery School, so that it could be built to its present size. In the first year the AAA School turned out a startling large number of alumni from its three student bodies: enlisted specialists, officer candidates, and officer students.

The school now under Brigadier General Bryan L. Milburn, Commandant, was first headed by Brigadier General Oliver L. Spiller, and then by Brigadier General Edgar H. Underwood. Constant innovations have been made due to the ever changing AAA picture and the aim to fit the training program closely to combat zone requirements.

Today the School stands as the last word in Antiaircraft Artillery. Among its students have been Marine and Naval personnel, and a special course for Air Corps officers is conducted regularly.

Every part of the School plays a vital part in making for the greater proficiency of the AAA and the success of our armed forces. The students who complete the intensive courses serve two great purposes through their acquired skills and knowledge. Not only do they form the nucleus of every AAA battery but they pass on what they have been taught to the thousands of soldiers who must be trained quickly in one of the most complicated fields of modern warfare.

Through another medium the School is constantly reaching AAA forces everywhere. This is through the film strips, technical and field manuals, and training films produced by the School's Division of Training Publications.

Under the new organization chart of the School many departments have been consolidated to form a more compact organization. Five departments are now listed in place of seven previously. Many of the functions of the eliminated departments are now covered by the remaining five. The departments now include Automotive, Gun, Automatic Weapons, Searchlight and Electrical, and Tactics. Formerly there were Communications, Location, and General Subjects Departments, while Automotive was a sub-department.

The School Regiment has taken the place of the School Brigade. It now has under it the WAC Detachment of the

School, which is constantly being increased, the Enlisted Overhead Battalion, the Enlisted Student Battalion, the Officer Student Battalion, and the OCS Battalion.

Many functions of what was the Operations Section are now directly under the Director of the Division of Instruction. Special Services is now part of the headquarters staff, as is the recently added Research Section.

Lt. General Joseph T. McNarney, Deputy Chief of Staff of the U. S. Army, and Major General Virgil F. Peterson, The Inspector General, witnessed demonstrations by AAA School troops in separate visits within the same week. Both seemed very much impressed with the efficiency of the demonstrating troops. Especially impressive was the exhibition of emplacing gun and automatic weapons units for action, in which exceptionally fast times were turned in. Enlisted men were interviewed as to their duties by the generals and made fine showings.

In day and night firing at Sears Landing, School troops performed with precision. Many class rooms of the School were visited as well as some departments. The generals watched AAA School students in various phases of the specialized training that is given at the School.

An Orientation program has been instituted at the School. In addition to supplying material concerning "Why We Fight," the Orientation Office provides ways and means by which soldiers can add to their education while in the army. At present, classes are being conducted in educational fundamentals for enlisted men. To keep the School personnel up to date with the happenings of the day, a daily news digest as well as a weekly news digest is distributed for display on bulletin boards. This material is prepared by the School's Public Relations Office. Army films in the "Why We Fight" series are being shown to all



In addition to the usual AAA guns, the AAA soldier must know how to handle this assortment of weapons.

at the School. Weekly classes in orientation will be included in the program.

A pictorial record of the training of a soldier, from basic to advanced combat training, is provided for use of students and school troops at the School. Housed in the Visual Aid Sub-Library, these films are shown daily to various groups. Individual showings are presented for special studies and for previews before showing to larger groups. Both 16mm and 35mm films, as well as film strips, are on file in the Library. More than 750 titles on technical and general military information are listed.

Material on actual situations regarding tactical employment of antiaircraft artillery units in maneuvers as well as in actual combat operations will be prepared and disseminated by the newly established Research Section of the AAA School.

In addition to studying, evaluating, and preparing such material, the Research Section will conduct periodic seminars at AAA training sites. These seminars will indoctrinate anti-aircraft commanders in the practical employment of AAA in actual situations. A portion of the section's staff will be employed in observing maneuvers. Generally the staff will be made up of officers with combat experience.

In every way possible the section will use a realistic approach to the problem of properly employing AAA units in support of army units. Every type of warfare in which AAA figures, whether in the Pacific or the European Theater, will be analyzed. The section is housed in the Division of Training Publications building.

School personnel are enjoying the treat of seeing what enemy guns look like. In a special outdoor section in the Department of Tactics' area several enemy guns are on view. These guns are the start of what may turn out to be a School museum. The first three captured guns to go on view are an Italian 75mm gun, a Japanese 20mm gun and mount, and a Japanese 75mm gun with some sort of director mounted on the piece.

AAA officers who have had actual combat experience are being given preference for assignments as instructors at the AAA School.

On the most unusual teaching methods used by the Tactics Department is a three-act play involving the hypothetical advance of an antiaircraft brigade from an Italian

city across a river to another center. With a cast made up of officers in the department, the play is presented each Monday afternoon. It is given for officers taking the Staff and Command course.

The plot involves a hypothetical situation in which allied forces have landed. It concerns movement and operations of a corps northward, with antiaircraft protection by a brigade. Various staff officers report the progress of the actions to the commanding general who directs the progress of the attack.

An interesting display of army ingenuity is shown in the Automotive Department's "field expedients" exhibit. These are devices used to get vehicles out of difficult situations and are spread over a wide area for practical demonstration.

An old army truck is used to demonstrate how to rig an overturned truck and set it on its wheels. This dilapidated truck has been turned over and righted nearly one thousand times for instruction purposes. The use of a winch with several different types of ground anchorage is demonstrated. At the same time, construction and effectiveness of the anchors, the "dead man," ground anchor, anchor stakes, trees, stumps, and other natural devices can be witnessed.

No officer candidate classes have been admitted to the School since Class 100 started its seventeen-week schedule in February. This was in line with the recent suspension of officer candidate classes in some other branches of the army. The AAA School's OCS was the first officer candidate school to be extended to the seventeen week course. The original class started at Fort Monroe, but future classes began the course at Camp Davis when the AAA School was established here.

To aid the sale of War Bonds, two AAA School enlisted men's shoes were given showings in nearby towns. *Giants of Variety of 1944*, with an all-AAA School enlisted men's cast, was first shown in the School area, where it was roundly acclaimed before being shown to a civilian audience at Kinston, N. C. Cash value sales of bonds due to the performance was \$221,390.25. *Scotch and Sofa*, the show of the 556th Battalion, 20th Group, AAA School was shown at Whiteville, N. C., and Dillon, S. C., where it brought large sales of War Bonds.



**Do you notify the JOURNAL of change of address every time you move?**

# Camp Stewart



BRIGADIER GENERAL E. A. STOCKTON, JR., *Commanding*  
By Major Walter H. Dustmann, Jr.

This giant home of antiaircraft artillery training entered its fourth year of active antiaircraft work during the January-February period and also received an official visit from five Major Generals and a Congressman.

Antiaircraft training in earnest began in mid-February, 1941, with the arrival of the majority of its personnel, all regularized National Guard units from Georgia, South Carolina, Alabama, New York and Pennsylvania, plus a sprinkling from many other states. In the three years since, scores of thousands of crack AA troops have been trained at Stewart and sent to the far corners of the earth.

In fact, a Stewart-trained unit was the first to see active combat in the South Pacific after Pearl Harbor and since that time many others have joined it in combat areas.

With advent of war Stewart underwent considerable expansion, with thousands of new troops moving in, with training intensified, and huge new firing ranges and other type ranges and training courses being constructed. It was a far cry from the early days when the troops were moved down to Fernandina Isle, Florida, and fired out over the Atlantic to the present day when the camp has two of the country's largest and most modern antiaircraft firing ranges. In the camp's young days hundreds of tracts of land were yet to be acquired and therefore it was impossible to fire on the reservation.

The Inspector General of the U. S. Army, Major General Virgil L. Peterson, made an inspection of troops, training and weapons late in January, accompanied by Major General Joseph A. Green, commanding the Antiaircraft Command.

In February three other Major Generals were visitors: Major General H. K. Loughry and Major General F. E. Uhl, Chief of Finance and Commanding General of the Fourth Service Command respectively, who came to pay tribute to Stewart's civilian workers for winning the famed January "T" Award for outstanding War Bond purchases; and Major General Sanderford Jarman.

Congressman Hugh Peterson, D., Ga., "The Father of Camp Stewart," also was on the same program with General Loughry and Uhl, a "Washington Day" observance attended by more than 2,000 civilian and military personnel. Congressman Peterson, who was instrumental in opening Stewart in mid-1940, made one of the principal addresses, as did the visiting Generals. Colonel William Ochs, Post Commander, received the "T" Flag on behalf of the Post.

General Jarman's visit was his first in more than a year. The two-month period also saw the arrival of Brigadier General LaRhett L. Stuart from Camp Callan, Calif., to take over the 66th AAA Brigade and the promotion to Brigadier General of Colonel George M. Badger, commanding the 62nd AAA Brigade. General Stuart replaced Brigadier General Oliver B. Bucher, who went to Camp Callan to take the post of its AAATC Commanding General vacated by General Stuart.

Realism in training at Stewart took on a new angle during the period with the opening of several "assault bayonet courses," which combine the best features of fast-action bayonet drill, and obstacle and cross country workouts. Several of these highly efficacious courses have been completed and the camp will shortly have a total of eight in use, as all old-type bayonet courses are being revamped. The new courses consist of numerous obstacles, such as hurdles, fox-holes and walls, with dummies appropriately placed. The soldiers scramble over, into or under, bayoneting the dummies as they progress. There is plenty of barbed wire, too, as well as "parry and thrust" dummies, to make the courses among the toughest anywhere. They are under the supervision of the Special Training Section of the AAATC.

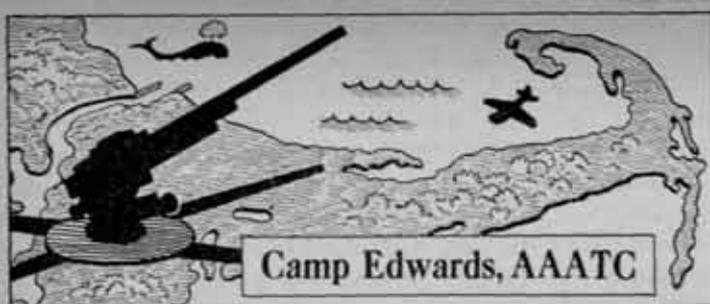
In January the 819th Battalion topped all units on the post to win a combination radio-phonograph awarded by the ASF Special Service Branch for the best dayroom orientation display. The 819th worked hard and effectively to devise eight potent exhibits that took the prize hands down. Typical of the effective display was the 5-by-9 foot relief map of the world, built on a ping-pong table, with all battle areas outlined in fluorescent paint. Other relief maps showed the Mediterranean area and the "Battle-ground of Russia."

Other Stewart highlights of the two-months period were: The Rising Sun and the Swastika were substituted on the rifle ranges for the traditional Maggie's drawers, to show soldiers when they missed the target. Better results were reported almost immediately. . . . *The Shoot 'Em Down*, official camp paper, began a weekly campaign through cartoons by its staff artist, Pfc. Henry Santos, to foster the camp's intensified scrap paper conservation program. . . . ASF Service Command personnel negotiated the famed live-bullet infiltration course as part of their stepped-up combat training program. . . . a Post Stockade Chapel, made entirely from salvaged materials, was opened.



Signal Corps Photo

Camp Stewart's Bayonet Assault Course.



BRIGADIER GENERAL JOSEPH E. HARRIMAN, *Commanding*  
By Captain Richard J. Kane

As an intensive, stepped-up training schedule progressed from the rigors of the Cape Cod winter into the balmy weather of spring, this Antiaircraft Artillery Training Center threw its entire resources and energies into preparing personnel for combat.

In line with General Harriman's "all-out" preparation policy, several hand grenade courses were reopened to permit trainees to acquire accuracy in planting their deadly "pineapples"; bazooka firing by training personnel has become a "must" on all unit schedules, and small arms firing on the 200, 300 and 500 yard transition courses now, more than ever, help to familiarize AA soldiers with the practical use of these essential combat companions.

Brigadier General Rupert E. Starr, AA Officer on the Staff of the Commanding General, Army Ground Forces, made an all-inclusive survey of training methods being used at Camp Edwards and included in his tour of installations trips to Wellfleet, Scorton Neck and Popponesset firing ranges where units were viewed in various phases of night firing training.

A most interesting step forward has been achieved in the activation and training of a number of new AA Ordnance Maintenance units who are prepared to rehabilitate and repair any mechanized equipment falling into the first through the fourth echelon service categories.

Mobility of operation and movement is the keyword of AA Ordnance. Nowhere in Ordnance today does a unit depend so much on motor-driven transportation to move from place to place.

The scope and activity of the work-a-day world of the highly mobile AA Ordnance ranges from their diversified ability to repair with equal knowledge and aplomb a 90mm gun or a wrist watch, and do it at the drop of a rifle pin.

Unlike the average Army ordnance outfits which are usually semi-stationary in workshop and personnel, the AA Ordnance-on-wheels are expected to, and do, travel far and wide to service and repair the delicate and highly technical equipment that comprises antiaircraft today.

These specifically include AA combat weapons such as the 90mm gun, the 40mm and 50 cal. machine guns and other small arms, as well as the precision instruments that are so essential in AA weapon operation. Height and direction finders, artillery fire control equipment, and motor maintenance all fall in these categories.

An AA Ordnance company at Edwards rates highly the recent achievement of an eight-man small arms repair crew which inspected some 14,700 rifles in sixty days, and repaired 400 of them. This to the repair crew doesn't rate as a record, but sixty days of labor which they hope to surpass when a similar opportunity is presented.

When assembled as a compact unit an Ordnance company comprises a special service unit in which is housed an electrical repair shop, a welding unit, electric forge and complete machine shop; an artillery repair shop capable of handling any type heavy duty work, a small arms repair truck; an office and personnel record vehicle that houses company records and "paper" work; and a wrecker that is capable of lifting 13,000 pounds with its powerful first winch, and upward to 17,000 more pounds when the steel fingers of its second winch are brought into play. And this mechanical monster is operated with ease by a three-man crew.

The compactness, newness and complete utility of AA Ordnance is reflected in its officer and enlisted personnel.

This *esprit de corps* is achieved primarily through the hand-picked process through which each member of Ordnance must pass. Ninety per cent of the men selected for this work were mechanically inclined in civilian life and pursued mechanical trades before entering the armed forces.

Following a five-week basic training period the personnel selected for Ordnance enter a thirty-week training period, the first period of which is devoted to theoretical study, and the latter half of which deals in its entirety with practical application of lessons learned.

In achieving their practical knowledge the men work directly with AA units-in-training and devote their energies to repairing the thousand and one breaks that occur in mechanically operated gun companies.

At this point Ordnance soldiers are graduated into their specialties; each trainee fits into the slot which can best use his specialized talents.

The supply arm of Ordnance is another branch of the specialized service wherein supply and demand must fit like a hand in a glove. Adequate supplies of material used in repairing AA equipment of every type must be kept stocked and transported when Ordnance moves into combat positions. If repair parts are not immediately at hand, then ingenuity and artfulness must play their part, and the needed replacements are forged in the field.

This emphasis on Ordnance at Camp Edwards does not mean that the units training here have foregone the dictum stated by Lieutenant General McNair recently in an issue of the *COAST ARTILLERY JOURNAL* that "Maintenance begins with the first echelon. If there is good driving and good first and second echelon maintenance, there need be little third echelon maintenance."



An AA Ordnance soldier repairing delicate equipment.



BRIGADIER GENERAL MORRIS C. HANDWERK, *Commanding AAATC*

*By Major Russell S. Price*

In the blackness shrouding the windswept dunes behind the AAATC at Camp Haan a small, grimy group of black-faced men inch cautiously forward through the sage.

Their course is strenuous; their progress is impeded by the wire clippers, grenades and implements of war strapped to them; behind them they drag softly and carefully five-foot, dun-colored tubes of sudden death. At the foot of a small ravine their progress is blocked by the tangled mess of a two-way barbed wire obstruction. Ahead lies the enemy.

Working in swift concentration, they roll to their backs and noiselessly shove bangalore torpedoes, length after length, into the matted wire ahead. The fuse is set, they scurry for safety, and the night is split wide open by a sudden terrific roar.

That is a "baccalaureate" ceremony for a hand-picked class of officers and men in one of the most concentrated schools offered in a Training Center. The course has been put into high gear by Brigadier General Morris C. Handwerk. It is the AAATC Mines and Demolitions School.

"Know how or you get killed," the grim slogan which has prodded many a crack antiaircraft unit through its stiff training course at Camp Haan, was never more apt than now, when the Training Center is putting its thousands of men through the final steps of preparation for the reality of war.

Camp Haan's AAATC units, for the most part, have passed the schoolroom, lecture, and drill phase of UTP, and with their specified period of military training behind them are buckling down to the payoff lessons learned in combat. Reality is stressed in everything, from the Judo school to the bivouacs in Camp Irwin's desert fastnesses; from the new day-and-night infiltration course being constructed south of Camp to the tracking and firing problem for the M1's and automatic weapons on the Mojave Desert.

Work in the Mines and Demolitions School is typical of the highly specialized and rigorous routine imposed on the antiaircrafters now that the Allies are moving in for the kill at both ends of the earth. And it has become so important that the Antiaircraft Artillery troops are thoroughly schooled in every phase of forward area operation.

There experts from each of the units in training at the camp grapple with the realities of booby-traps, anti-personnel mines and high explosives. They learn by doing the job that will face them later—and as one rumpled soldier said as he picked himself out of a suddenly blasted crater:

"This course is dynamite—and I'm not kidding!"

Spurred on by almost daily reports from the battlefields of the extensive use of mines and booby traps by the enemy, and by the report brought to Camp Haan in February by Brigadier General Rupert E. Starr, Antiaircraft Liaison Officer of the Army Ground Forces, that "the importance of training in land mines and booby traps . . . cannot be stressed too strongly," no effort has been spared to make this school as nearly the real thing as possible.

It is believed in the AAATC at Camp Haan that the school, with its rocky "classrooms," is as complete as can be obtained.

There acres of land have been rutted, pitted, and blown sky-high day after day as the students, forty to fifty at a time, learn to lay mine fields and clear enemy fields; emplace, detect and remove booby traps; handle bangalore torpedoes in clearing mine fields and barbed-wire entanglements; probe and breach mine fields at night, and in all respects learn the dangerous game of high explosives.

That the game is dangerous is clearly attested to by the "graveyard" conspicuously placed on a small knoll some hundreds of yards from the ammunition dump. Here, when each new class begins the school, is an empty, neatly-marked square. Here, when each veteran class finishes, are row on row of white crosses—one cross for each "casualty" suffered during the course.

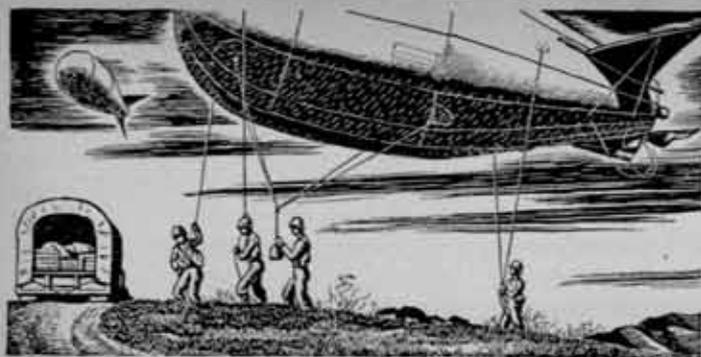
"Casualties" are thick and heavy at the first. Then the men are new—some careless, some frightened, most of them clumsy. A week later they are veterans, and the crosses stand as testimony to knowledge learned the hard way.

"When a class first starts," says the instructor, "everything for yards around is thoroughly booby-trapped. Pick up a book, and boom! Same for helmets, car cushions, boxes and dummies. The men are jolted again and again; then they learn to look, probe, and experiment first. They don't stay careless long."

Graduated from the Mines and Demolitions School, each unit's experts rejoin their battalions and groups and become instructors in turn. Now the mine fields are never empty, as battery groups of antiaircrafters are in their turn run through the course so painstakingly explored by their specialists before them.



Students at the Mines and Demolitions School.



## CAMP TYSON

COLONEL WILLIAM H. DUNHAM, JR., *Commanding*

*Barrage Balloon Training Center*

*By Captain F. R. Alexander*

Fullest utilization of the manpower of the Barrage Balloon Training Center with many of the administrative troops reassigned to other units, plus a final polishing on the training marked the spring months here.

In line with the War Department directive, a complete survey of operating enlisted personnel was instituted and reassignments were made utilizing their knowledge, background and experience. All of the BBTC troops were affected by the readjustment which is still in progress.

The snow, rain and mud of the Tennessee winter and spring did not curtail training activities but rather increased in pace with the increasing tempo of war. Balloon training was still stressed and in addition, the troops were given infantry training to harden them physically and condition them mentally.

All tactical units completed two weeks on highly realistic field problems, living out in the open and learning at firsthand the "whys and hows" of taking care of themselves. A twelve-mile road march was held every week, with a twenty-five mile hike held every month. All personnel have now undergone a thorough and intensive training in land mines, explosives, booby-trap, and demolition training. Sixteen hours of night training is regularly scheduled every week.

Two practice and one live grenade courses were opened and the troops have been showing effective results during both the wet and dry runs. Work on the Infiltration Course was effectively wound up early in the year after all of the BBTC personnel, including Headquarters staff, crawled under machine-gun fire during both day and night runs.

An Officers' Tactics and Field Service Course was conducted by the Barrage Balloon School during February and March for all officers of tactical units. The School also conducted a number of troop and officer schools for specialists from the various units. The subjects included Army education, unit administration and supply, map and aerial photograph reading, military law, motor transport, mess management, communications, ordnance, and target recognition.

The sharp reduction of the venereal rate in the Barrage Balloon Training Center was praised by Major General Joseph A. Green, commanding general of the Antiaircraft Command. In commenting upon General Green's commendation in a letter issued to the entire command, Colonel William H. Dunham, Jr., commanding officer of BBTC,

said: "That you have made such a splendid improvement is proof of your patriotism and is worthy of the highest praise."

The Literacy Program of BBTC which was an established training activity and held two hours a day, five days a week, has now been discontinued following successful attainment of the objective.

The award of a second Legion of Merit was made here when Staff Sergeant John M. Lewis, Jr., received the decoration at a special parade and review. Sergeant Lewis was instrumental in bringing to justice a ring of marihuana peddlers and users. Late last year Captain Willard B. Chellis of the Barrage Balloon School was awarded the Legion of Merit for his meritorious work with a balloon battalion in the Hawaiian Islands.

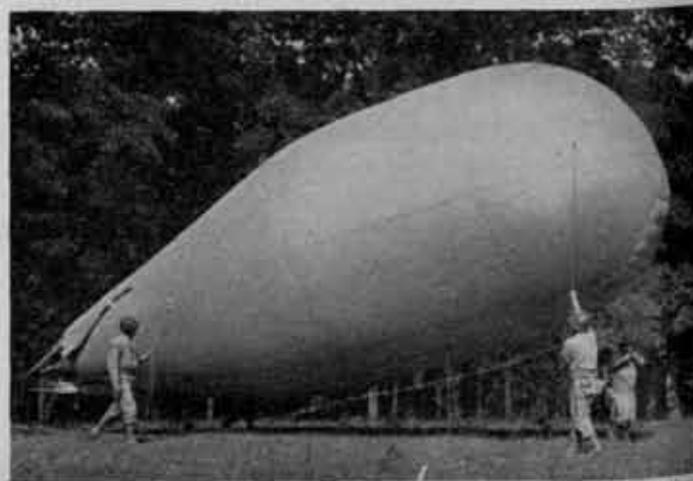
Marksmanship training for all officers and every enlisted man armed with the submachine gun was made possible through the opening of a 550-acre range in the north-west part of the reservation. Hitherto, only familiarization firing was possible but now all who are habitually armed with the weapon have been able to be trained.

Proper conditioning and prompt medical attention played a large part in keeping down to a marked low the number of admissions to the Station Hospital during the winter and spring. Respiratory diseases such as influenza and common colds were far fewer than a year ago and also much less than in other parts of the nation.

In the intensity of the training program, the off-duty hours of the troops were not forgotten and a full program of sports and recreation was provided for their entertainment. Activities were scheduled every night at the two Service Clubs and met with much approval.

Two Post Basketball Leagues engaged the major sports interest of the troops and games were played three times a week in the Field House. Bowling leagues were organized for both officers and enlisted men while the same procedure was followed in the forming of small-bore rifle leagues. Rivalry proved to be keen throughout. Early in the spring softball and hardball engaged the interest of the Post with battery and battalion nines vying for the trophies.

The appeal for funds from the American Red Cross, the Infantile Paralysis Fund, and the Fourth War Loan Drive, met as always, with generous and whole-hearted support from BBTC personnel. The Paralysis Fund was given \$1,560 in a one-day drive while response to the War Loan Drive was heavier than in any previous campaign.



Signal Corps Photo



## Northwestern Sector

BRIGADIER GENERAL JAMES H. CUNNINGHAM, *Assistant Sector Commander for Harbor Defense Matters*

Bronze cannons were recently installed in front of the entrance of Headquarters, Harbor Defenses of Puget Sound. They are of great historical interest: 5.2", smooth bore, fired a twenty-six-pound solid shot. They were cast of Peruvian bronze in Manila (P.I.) in October and December 1803, and were originally emplaced in the water battery along the Esplanade facing Manila Bay. Engraved on their barrels are the names by which they were known to the Coast Artillery men who served them more than a century and a quarter ago. The guns are named "S. Lazaro" and "El Miserable."

While antiquity and tradition are symbolized by these cannons, variety and progress have been the keynote programs established throughout the harbor defenses in the Northwestern Sector of the Western Defense Command. There has never been a dull moment for officers and enlisted men assigned to the harbor defenses in this sector.

During the first two months of 1944 schools for non-commissioned officers were held in each harbor defense, first in the Harbor Defenses of the Columbia and later in the Harbor Defenses of Puget Sound. The noncommissioned officers attending these schools were excused from all other duties and were given certain basic military training which some of them lacked, as well as tactical and technical training, with constant emphasis on leadership.

Two schools for officers were held in the Harbor Defenses of Puget Sound, one covering battery administration and a review of the very necessary basic subjects, and the second placing emphasis on gunnery and orientation. Here again, practical problems predominated with day and night classes. A service target practice was fired by this school following the January '44 edition of Technical Manual 4-235. The school was divided into groups of five officers, each of which made a complete analysis and a target practice report as required by regulations. March will see a continuation of these officer schools for two additional groups so that every battery officer will have reviewed the principles and learned the new procedures. Simultaneously a school for unit gas officers and noncommissioned officers was held for the purpose of reviewing their special duties and having further instruction throughout the entire command in this important subject. Similar schools were held in the Harbor Defenses of the Columbia.

On 22 February '44, the first service target practice in the Harbor Defenses of Puget Sound under the new technical manual was held. Two days later a joint command post exercise was conducted with Canada.

Major Owens and Captain Wilson, who attended the

Commando School conducted by Western Defense Command, have, since their return, been giving instruction in this type of warfare. Enthusiasm and interest has been shown by officers and enlisted men throughout. It is expected that this hand-to-hand combat training will instill an even greater measure of determination, self confidence and leadership.

Constant changes and improvements are being made in the facilities for training. At Fort Worden a new bayonet assault course will soon be completed.

During the Spring and Summer of 1943, tons of fresh vegetables were raised by the gardens of the batteries in the Harbor Defenses of Puget Sound. Plans are well under way for even more efficient operation of gardens.

Colonel C. S. Doney, commanding the Harbor Defenses of the Columbia, has presented soldier's medals to eight members of his command. These are Second Lieutenants Charles H. Bland and Alfred W. Schalk, Staff Sergeants Delbert E. Jones and Bernard J. Ridders, Sergeants Vernon G. Riggert and Ernest W. Fiegurth, Corporal Arthur H. Strube and Private First Class Genaro V. Perez. These awards were made for heroism at the Harbor Defenses of the Columbia on 13 January 1944. "While on duty at an installation of the Harbor Defenses of the Columbia, these men, knowing the danger to their lives it involved voluntarily proceeded out on the jetty in the face of a violent wind, which was causing waves to break with great force over the jetty, and attempted to rescue a Navy pilot who had parachuted from a Navy airplane into the Pacific Ocean. These men were washed several times from a railroad trestle to rocks below and were buffeted by the waves. These men reached a point of about 2700 yards from the shore end of the jetty. Two of the men were hospitalized, and all required medical attention. Although the attempted rescue was not successful, the willing self-sacrifice and heroism displayed by these men reflect great credit upon themselves and the military service."

At Astoria, Oregon, the 249th Coast Artillery band and orchestra is being broadcast every other Thursday night. The basketball team of these harbor defenses was also highly rated by the Dick Dunkle forecast for the week ending 7 January 1944. It was placed thirteenth on the list of far western teams. Their record was eight games won and one lost.

In the Service Command Unit No. 1924, in the Harbor Defenses of the Columbia, more than two hundred awards for rifle and pistol qualifications were made to officers and men.





BRIGADIER GENERAL H. C. ALLEN, *Commanding*

*By Major Prime F. Osborn*

Dull February days have been enlivened by visits to this Training Center of Major General Green and several other general officers of the AA Command. These visits are appreciated by the Training Center and each one was of much benefit. Even the weather was propitious, and Texas skies smiled unexpectedly but pleasantly upon the visitors.

Enlisted men of Headquarters Battery, AAATC, had plenty of rank with them recently as they crept and crawled through the mud and water of the infiltration course. As the headquarters personnel went through their paces on both day and night runs, many of Brigadier General Allen's staff officers could be seen among them hugging the ground just as lovingly and finishing equally wet and dirty.

The Training Center, through its Target Recognition section, has issued to all units a new training aid in the form of a Field Kit. Aircraft recognition, always difficult because of its demands upon memory, requires constant repetition and reiteration to keep it at the maximum effective level. During the time a unit is in movement from a training center to a combat zone there is often an instructional "lag" due to unavailability of proper training aids. This Field Kit has been developed to provide silhouettes, charts, and instructors' guides in one portable unit for use during that period.

The following considerations determined the design of the kit: that it be compact, independent of electricity, rugged in construction, that the planes included be accurately reproduced and in sufficient quantity to permit many small groups to be trained at one time. The training aids within the set are of three types. They are (1) plywood flash cards, (2) ten sets of posters, and (3) ten sets of instructors' guides. The flash cards, treated to withstand rough handling and attacks by the weather, have head on, oblique, or side views of sixty-three operational planes. The posters, of all class "A" operational aircraft, were prepared by the Adjutant General's Office and this Headquarters. The accompanying instructors' guides contain teaching information on all of these operational aircraft.

Distribution of these kits has been made down to and including battalions. It is anticipated that they will be used by gun sections with instruction given by the section chief or squad leader under the supervision of battery recognition officers.

A vital adjunct of proper recognition is the perfection of an effective warning system to carry information of approaching planes to all fire units. To aid units in understanding and solving the problems of aircraft warning systems an Operations Room has been completed and made available. The "Ops" room was described in some detail in the Hulen notes of the January issue of the JOURNAL. Although in use for only a short time the Filter Center has already proved its worth as a valuable training aid. All units are now being instructed in the operation of the room, four hours of training going to every officer and six hours to each officer and enlisted man of the S-2 and communication sections.

A map room has been prepared with all the equipment necessary for the issuance of maps and map training aids and for the conduct of classes in map reading and allied intelligence subjects. All available maps have been catalogued and sorted for ready issuance to units. Maps for tactical use on field problems are separately indexed. Sets of maps for class instruction are prepared with 40 small individual sections for members of the class and an enlargement of the same area for the instructor. Wall space has been used for "exhibits" designed to show the preparation of a map, types of maps, foreign maps, aerial photographs and photo maps, and map charts for training. This room has been furnished with blackboards, easels, and officers' mess tables to provide every convenience for the study of this important subject.

Worthy of particular mention are two training devices which have proven of value to Hulen gunners. These aids, a check sight and lead training device, were perfected by gunnery officers of the training center, and have been used on the ranges. A rigid metal check sight with the rear element adjustable vertically and laterally facilitates simple and rapid orientation. By centering the target in the peep hole of this rear sight, leads may be read off on a front sight which has rings representing 35, 70, 105, and 140 mils. Horizontal and vertical cross hairs are provided in this front element to separate the components of the lead. The distance between front and rear elements is 18 inches. The stability of the sight serves to neutralize the extreme vibration of the multiple gun mount developed during firing. Item number 2, the lead training device, for basic M15



Check sight developed at Camp Hulen.



BRIGADIER GENERAL CORTLANDT VAN R. SCHUYLER,  
Commanding AAATC

By Lieutenant Roger B. Doulens

Focusing of considerable public interest on the use of "rockets" in training antiaircraft artillery troops was a major highlight of activity at the Antiaircraft Artillery Training Center in recent weeks.

Other important events were the visits of the Inspector General of the United States Army, Major General Virgil Peterson; Lieutenant General Joseph T. McNarney, Deputy Chief of Staff; Major General Joseph A. Green, Commanding General of the Antiaircraft Command, and other high officers.

While the rocket target method of training troops has been in use for a number of months at most centers of antiaircraft artillery training, its revelation to the public generally created much interest and curiosity because of widespread publicity given to so-called rocket weapons supposedly about to be used by enemy forces.

Coincident with the awakening of national interest in the rocket targets, it was revealed that General Green was the source of inspiration which led to development of the device as an important aid in schooling antiaircraft artillerymen quickly to train their fire on high velocity enemy planes. He conceived the idea while attending infantry maneuvers in 1940. The General had been watching infantrymen fire their mortars when, according to associates, it suddenly occurred to him that this principle of artillery might be adapted for use in AA troops' schooling.

The matter was referred to the National Research Committee. Scientists attached to the committee went to work and soon the rocket launcher and the projectile now in use were developed.

Early in January the AA Barrage, official camp news-

paper of Camp Davis, reproduced composite photographs showing the rocket target device in action. Newspapers, newsreels and other agencies conveying news to the general public immediately evinced much interest.

Then, on February 19, the celebrated "Army Hour" radio program selected Camp Davis as one of the military centers from which the program was broadcast. "Piece de resistance" from this center was the rocket target feature.

It was during the Army Hour broadcast that Brigadier General C. V. R. Schuyler, Commanding General of the AAATC here, related the story of General Green's inspiration which led to development of the rocket device. After General Schuyler had described the genesis and development of the device, rocket launcher and automatic weapons crews of the 446th AA (AW) Battalion put on a demonstration of the training feature. The "mikes" picked up the sound of the demonstration, complete to the commands by the launcher and gun crew commanders. Reports of listeners were practically unanimous that it provided a great show.

General Peterson, the Inspector General, came to Camp Davis late in January for an intensive inspection of the AAATC, the Antiaircraft Artillery School and Fourth Service Command activities.

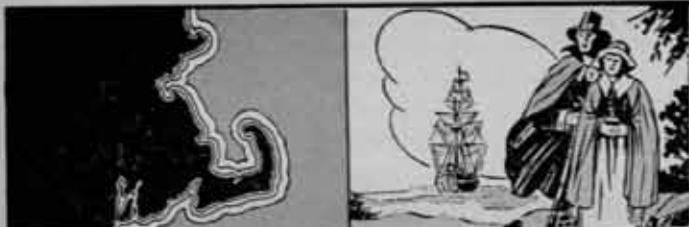
Immediately following the visit of General Peterson, General McNarney arrived to observe training activities at the AAATC. General McNarney, too, was shown the marksmanship of AA gunners. The Deputy Chief of Staff turned the tables on the gunners, however. During firing by multiple mounted .50 caliber machine guns from half tracks, General McNarney stripped off his overcoat and manned a gun turret himself. For several minutes he poured an unrelenting stream of accurate fire at the targets presented.

A radio show broadcast over North Carolina outlets was inaugurated in February. The initial performance of the weekly show entitled *Pass In Review* was attended by General Schuyler and Brigadier General Bryan L. Milburn, Commandant of the AA School, both of whom joined a large audience in generous applause for the all-soldier cast. A regular feature of the broadcast is the antics of *The Sad Sack*, AA style.

is built as a lead chart and shows the lateral and vertical leads for three "canned" courses of different angles of approach and with varying values for  $R_m$ ,  $H$ , and  $S_g$ . Actual plane missions are flown to correspond to this assumed data. Leads are transposed from a straight line chart to a curve, and are based on the present position of the target. Each course is plotted from "left to right" and "right to left" and so indicated by arrows. Another chart showing the vertical leads for an incoming course is superimposed on the sighting element of the device. It is based on the present position of the target for a course with  $R_m = 300$  yds,  $H = 300$  yds, and  $S_g = 150$  mph. The device fits over the armor plate windshield and is oriented when installed by placing the front edge of the horizontal chart parallel to the course. To operate the device the operator stands on the hood of the vehicle and a second man, in the cab, reads off the leads and angles of approach

as the tracker follows the target with the device. Such a process helps to teach leads, serving to fix the amount of change in the lead required, and the rate of that change.

Men and officers alike seeking evening transportation into the town of Palacios and week-end rides into Houston are indebted to Special Services for a new convenience. Each evening between 1700 and 1900, and 1630 to 2000 on Saturdays, trucks obtained from the units make the rounds of the camp picking up those waiting for the overburdened civilian vehicles. Supplementing these civilian facilities, there are now no tiring waits to detract from the pleasures of the too few off-duty hours. Convoys are also run into Houston on Saturday afternoon with the return trip on Sunday. Again, exasperating delays and lost time are avoided for the soldiers fortunate enough to be given the privilege of riding with the convoy. Quotas for this convoy are allotted each unit.



## Northeastern Sector

MAJOR GENERAL K. T. BLOOD, *Commanding*

*By Captain Howard O. Husband*

Under the War Department reorganization of the Army's defenses along the Atlantic Coast, on 1 March, the New England Sector was absorbed into the newly-created Northeastern Sector. Major General K. T. Blood was designated as commanding general of this new subdivision of the Eastern Defense Command.

The training program in the Northeastern Sector for 1944 stresses thorough preparation of the troops for combat. Intensive physical conditioning including calisthenics, hikes, road marches, infiltration and obstacle courses, hand-to-hand fighting and massed sports and games are important features on the schedule. Classes in barracks and dayroom are conducted to keep the troops currently informed of the latest developments in this global war.

The Sector Mobile Force has also included in its physical fitness program a village fighting course and instruction in Judo.

The training objectives of the Sector Mobile Force include instruction in the firing of all weapons with which the organization is armed, the use of grenades, dismounted patrolling, use of cover and concealment, construction or reduction of road blocks, and detection of mine fields. Routine reconnaissance patrols furnish a maximum of practical instruction in all subjects of field training.

In preparation for overseas service, emphasis has been placed on training the harbor defense troops in intelligence, map and aerial photograph reading, preventative medicine, land mines, and booby traps.

An interesting field problem was conducted recently at Fort Terry in the Harbor Defenses of Long Island Sound. The troops participating were divided into groups of "invaders" and "defenders." All personnel subsisted on "C" ration for the duration of the exercise.

Special Service activities continue on a busy schedule. The highlight of entertainment events was the spectacular success of the New England Sector War Bond Cavalcade, under the supervision of Major Elliott A. Niles, Sector Special Service Officer, which sold bonds amounting to the phenomenal total of \$34,188,260 during the Fourth War Bond Drive. The show was written for the most part by T/5 Bill Rega and starred all soldier and WAC entertainers, many of whom were professionals before entering the service. The Cavalcade's tour was launched by a performance at the Plymouth Theater in Boston. Admission was by the purchase of war bonds and the audience paid \$972,000 to secure their seats. Sales of war bonds totaling \$3,663,000 were made by the conclusion of the show's opening night. The tour made a wide circuit of Massachusetts appearing in the afternoon at various war plants and playing a different town every night. The members of the troupe felt adequately repaid for their efforts by the packed houses and the enthusiastic reception given each performance by the audience.

In the Harbor Defenses of Portsmouth, a weekly radio program made up of comedy sketches, soldier quizzes and music furnished by the Harbor Defense dance orchestra will soon be broadcast over the Mutual Network's Station WHEB. The personnel at the Harbor Defenses of Long Island Sound are entertained by musical programs presented every two weeks. The program alternates between classical selections and dance music.

Three soldier artists engaged in the Soldier Art Program in the Harbor Defenses of Boston are painting murals and landscape scenes for the decoration of recreation building and mess halls. The first group of paintings, which have been hung in the WAC dayroom and mess hall drew admiration and favorable comment from all who have seen them.

Many entertainment events have been presented in the Boston Harbor posts. An old fashioned minstrel show with a cast of more than 50 WAC's and enlisted men at the Fort Banks Theater was well received by the large audience. In addition to the regular USO shows and civilian amateur groups visiting the harbor, the Special Service Office arranged for 15 complete shows from the leading night clubs in Boston. All these performances made a big hit with the command.

Even with the increased tempo of physical training, members of the command continue to show interest in all sports. Basketball and bowling leagues are active in all the harbor defenses. In this season of the year, winter sports receive their share of attention. Considerable use has been made of skis and snowshoes in recent weeks.



First aid may be your last—if the seal on your First Aid Packet is broken. The seal keeps germs out of the packet—and you. Don't break it!



## Chesapeake Bay Sector

BRIGADIER GENERAL ROLLIN L. TILTON, *Commanding*

By Lieutenant Alonza F. Colonna

In keeping with an over-all training policy designed to prepare personnel for any possible type of combat and any eventuality, members of this command continued to carry out preparations for combat. During the past two months the regiment under the command of Colonel Wilmer S. Phillips has been through a strenuous exercise.

Not content with lectures, films and study courses provided for this purpose, actual operations have been carried out and physical movement of troops has taken place in a simulated operation.

During the exercises, packing was simulated by a demonstration and lecture given by the Third Service Command at the Fort Monroe theater at which all unit commanders and their unit mechanics were in attendance and held discussions. Realistic in every way, the exercise went into detail to such an extent that units were required to set up field ranges and prepare and serve at least one meal in a railway car following the same procedure as in an actual movement.

The majority of the units in Chesapeake Bay Sector completed this exercise during the past several months.

Attacking forces were repelled successfully in an exercise held under the command of Lieutenant Colonel W. B. Hawthorne. Railway batteries in the early dawn of the first day of the exercise moved out and when the "theatre" of war was reached laid spur tracks and met the "enemy" with simulated fire carried out with field artillery methods. Rain

and snow made the exercise more realistic with officers and men bivouacked in a wooded area adjacent to the firing point. Following the defeat of the attacking forces, tracks were taken up and the batteries moved back.

Actual firing and proficiency in fire arms continued to be the training keynote of the Provisional Coast Artillery Brigade under the command of Brigadier General D. P. Hardy. A high percentage of the large number of target practices conducted by the units was given top rating by the Eastern Defense Command.

The Mobile Force of the Sector, under the command of Colonel C. B. McClelland, in addition to carrying out the assigned tactical mission, has not neglected training exercises, and several 36-hour field problems have been conducted.

Harbor Defenses of Beaufort Inlet for the past two months placed emphasis on preparation for record target practice, mental conditioning and close combat firing, and preliminary marksmanship training.

Fort Story, headquarters for Harbor Defenses of Chesapeake Bay, under the command of Colonel P. H. Herman, saw its units redesignated as the Provisional Training Group with the primary object to train the personnel in all subjects better qualifying them for combat duty.

With Spring just around the corner, morale of the troops in the sector has shown a decided upswing and outdoor games have already started during the first balmy days that have been interspersed with the last of winter.

Plans for a baseball team to represent Fort Monroe have been formed. It also is planned to bring several of the major league clubs to Fort Monroe during the spring training season for exhibition games.

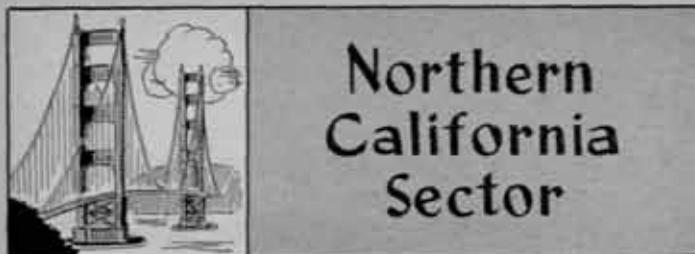
Practically every installation in the command already has made plans for an outdoor athletic program that will give the personnel an opportunity to take part.

Basketball leagues in the entire sector finished what was termed a "successful season" with teams from the various posts marking up excellent records in competition with other service and civilian aggregations.

Not content with military activities, all of the units in Chesapeake Bay Sector more than subscribed their quotas in the Fourth War Bond Drive with several of them showing oversubscriptions of as much as 25 per cent. Bands in the Sector also assisted in War Bond rallies and personnel who were available were sent to assist in putting the drive over.



Gas hasn't been used in this war—yet. But smart soldiers are still keeping their gas masks in perfect condition—just in case.



## Northern California Sector

BRIGADIER GENERAL RALPH E. HAINES, *Commanding*

Brigadier General Ralph E. Haines has succeeded Major General Walter K. Wilson in command of the Northern California Sector of the Western Defense Command. General Haines also retains command of the Harbor Defenses of San Francisco in addition to his new duties.

A new commando combat training school for officers was inaugurated last month at Fort Cronkhite, under the auspices of the Northern California Sector, Western Defense Command. The first class was comprised of a group of fifty officers from various units of the Army, Coast Guard and California State Guard stationed along the entire Pacific Coast.

The instruction lasted five weeks and consisted of learning the intricacies of individual commando fighting, group commando raiding, crossing streams in the face of opposition, and street, village and mountain fighting. This strenuous and intensified training was climaxed by a commando raid staged in San Mateo County during which the officers, dressed in red uniforms, were landed on the bay side of the peninsula and struck out overland to "destroy" an objective twenty-five miles distant. As police, local defense organizations and various Army units had been previously advised of the raid, their task was made all the more difficult.

Not to be outdone by the males, the nurses stationed at Fort Baker have also completed an intensive training program designed to make them more capable of taking care of themselves under field conditions. Included in the training was a trip over the rugged Fort Barry commando course.

Entertainment, especially the Hollywood variety, has been streaming into the HDSF of late. By now, practically every artilleryman in the defenses has seen at least one movie star.

The biggest single influx of cinema talent came shortly after Christmas when Mickey Rooney, George Burns, Gracie Allen, Anne Baxter, Phil Silvers, and Porter Hall toured the batteries and outlying positions. A few weeks later Miss Ginny Simms sang for the patients at Fort Baker hospital. Miss Simms shared the billing with Raffles, a

talking Mynah bird owned by Mrs. Carveth Wells. Other special entertainment included an appearance by Isaac Stern, concert violinist, and a USO-Camp Shows presentation entitled, *Let's Go*.

Artillerymen at Fort Cronkhite suffered a loss a short time ago when fire destroyed the interior of their Service Club. Apparently originating from a carelessly discarded cigarette butt, the flames wrought \$3700 worth of damage to furniture, walls and building. The library, which was housed in the same building, escaped injury. The Service Club was quickly reestablished in the Fort Cronkhite Officers' Club pending restoration of the Service Club.

Fort Baker celebrated the opening of a new Service Club in mid-January, with more than two hundred guests turning out for the inaugural dance. In addition to its recreational features a bigger and better post library is incorporated.

Fort Scott has also followed the literary trend and is now the proud possessor of a new library on the second floor of the building just north of the Post Guardhouse. The library has attracted more men than ever before and \$3,000 worth of new books have been added to its shelves to satisfy increased demands.

A three months' program of instruction for soldiers of the Northern California Sector with little or no formal education is underway at Fort Barry. The course deals with the three R's and is bulwarked by military subjects. First Lieutenant Donald Smith is in charge of the school.



The fire's hot and the water's cold as officer students take their commando lessons.



Remember, one speck of sand or grit can ruin a bearing. Watch out for dirty hands, tools, benches, rags, cleaners and lubricants.



# BOOK REVIEWS

The JOURNAL can supply any book in print, at the usual Association discount.

## TEXTS

### Surface With a Smile

**MAP READING FOR THE SOLDIER.** Washington: The Infantry Journal, 1944. 101 Pages; Maps; Illustrated. \$1.00.

Using the same technique and manner of presentation as in *How to Shoot the U. S. Army Rifle* and *Scouting and Patroling*, *Map Reading for the Soldier* presents its subject in an absolutely painless manner. Any soldier would get a chuckle out of the discussion of azimuths or of coordinates—the one is rather hawdy humor and the other packs sex appeal. As taught in the days not so far in the past, map reading was a course that bored most soldiers and many officers to tears, even though they realized its importance. With this new text, it is a case of learn while you laugh—and lest this frighten off our more sober brethren, you really *do* learn, and in a manner that will make you sick.

Photographs of such unrelated items as the hindquarters of a hippopotamus, and six WACs in a jeep, might seem out of place in a textbook on map reading—but they help to drive home very important points. This book is worth a dollar even if you know all there is to know about reading maps—it might save your students the boredom you went through.

### Junior Jane

**THE ENEMIES' FIGHTING SHIPS.** By Jay Launer. New York: Sheridan House, 1944. 222 Pages; Illustrated. \$3.75.

Mr. Launer is quite frank in admitting that it is possible our enemies have been able to conceal from us (and from him) much information about their fleets, and that this book is not a true guide, but he does indicate that the volume is the best possible compilation from the material available. Much of the book is taken up with the Japanese navy, both because it is the larger of the enemy fleets, and because it provides the more difficult problem in the way of our victory.

The painstaking work Mr. Launer put into the book has brought results. Pictures, silhouettes, and standard data provide factual information of every known type of Japanese war vessel, from battleships to mine sweepers. More general discussions provide background material as well as details of naval air bases and other installations that aid in making

an estimate of the capabilities of the Japanese. The war loss section is especially interesting; although it has been compiled from various sources and necessarily cannot be expected to be absolutely accurate; if errors were made they were made on the side of conservatism.

Mr. Launer has performed a workmanlike job.

### Abaca to Zwitterion

**ILLUSTRATED TECHNICAL DICTIONARY.** By Maxim Newmark. New York: The Philosophical Library, 1944. 340 Pages; Appendix; Illustrated. \$5.00.

The reviewer knew what "abaca" meant, but "zwitterion" had him stumped. (It is an ion that is charged both positively and negatively. Also called amphoteric ion and dipole ion.) His average through the rest of the thousands of definitions was definitely much lower. Mr. Newmark's definitions are masterpieces of conciseness. The identifying abbreviation with each definition, telling the field that the term is used in, is also particularly helpful. This book should be valuable to a large variety of military people, from quartermasters to field manual writers.

### Visual History

**HISTORICAL ATLAS OF THE UNITED STATES.** By Clifford L. and Elizabeth H. Lord. New York: Henry Holt. 340 Pages; Appendix; Illustrated; \$5.00.

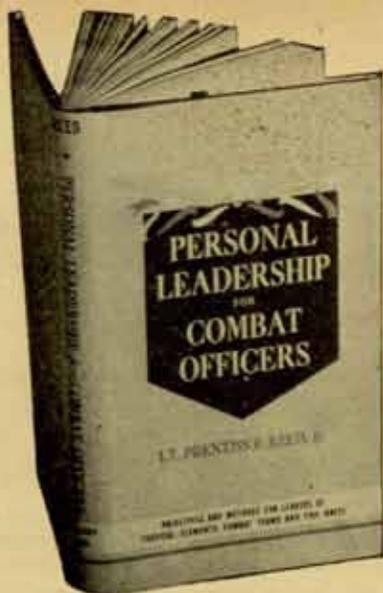
Here is an unusual presentation of history—a visual representation that indicates by means of maps the march of progress in America. Economic, political, and social progress are all represented. The charting and graphing of the changes is indicative of imagination as well as of research on the part of the authors.

A trace of confusion in chronology is an evident, but not fatal, defect in the work. Some might criticize certain choices of material as not important to the whole work, but it is quite probable that every item of information might be of use to certain readers.

Helpful facts and data for military men in these authoritative

## NEW BOOKS

Order your copies today



### PERSONAL LEADERSHIP FOR COMBAT OFFICERS

A concise manual of objectives and methods for leaders of tactical elements, combat teams, and fire units. Provides a comprehensive framework for an officer's attitude and gives him the methods he will use in his work. By Prentiss B. Reed, First Lieutenant, Coast Artillery Corps, 116 pages, \$1.50.

### MILITARY CORRESPONDENCE AND REPORTS

Brings together regulations and directives of the Army regarding written forms, and presents practices and rules concerning presentation of reports, writing of letters and messages, and preparation of orders, bulletins, and memoranda. An authoritative pocket guide-book and style manual on Army writing practices. By A. C. Howell, University of North Carolina, 190 pages, \$1.50.

### THE THERMODYNAMICS OF FIREARMS

The first book in English to place interior ballistics on a sound theoretical basis by means of thermodynamics. Covers the behavior of propellant explosives in firearms in an elementary manner geared to the practical problems of the interior ballisticsian today. By Clark Shove Robinson, Lieutenant Colonel, Ordnance Reserve, U. S. Army, 179 pages, \$2.50.

### MILITARY APPLICATION OF MATHEMATICS

Brings together the problems in all branches of the armed forces which can be solved with a background of high school mathematics. Provides direct training for all types of military service, explains practical military problems by means of examples and exercises, and shows how the various activities involved are related to each other in combat operations. By Paul Hanson, Lieutenant, U. S. Army (Retired), 447 pages, \$3.00.

### THE MILITARY STENOGRAPHER

Offers excellent preparation and practice material for military stenography, consisting of Gregg shorthand outlines for military terms and phrases, solid-matter dictation, and glossary. Covers, with definitions and outlines, court-martial proceedings and terminology, military ranks and functions, and complete service phraseology. By Queena Hazelton, 133 pages, \$1.00.

Get your copy from

## The Coast Artillery Journal

631 Pennsylvania Ave., N.W.

Washington 4, D. C.

### Language of the Boot

ITALIAN SENTENCE BOOK FOR THE SOLDIER. Frank Henius. Washington: The Infantry Journal, 1943. 94 Pages. 25¢.

ITALIAN DICTIONARY FOR THE SOLDIER. By Frank Henius. Washington: The Infantry Journal, 1943. 211 Pages. 50¢.

The *Sentence Book* is designed to enable the soldier to give directions, and to get what he wants in the city or in the country, or on the road or on the train. The *Dictionary* is merely a dictionary, with the choice of words slanted to the needs of the American soldier. Both are pocket volumes, inexpensive, and accurate. They should fill a real need.

✓ ✓ ✓

### Aviator's Telephone

ROGER WILCO: ABC OF RADIO FOR FLYERS. By Lieutenant Adras P. LaBorde. Harrisburg: Military Service Publishing Company, 1943. 101 Pages; Appendices; Illustrated; Index. \$2.00.

Lieutenant LaBorde's book is not a text on radio engineering but a guide, written in an entertaining and conversational style for the use of radio in aircraft. Procedures, signals, phraseology and general discussions of the use of radio make up the bulk of the book. It should be very valuable for pilots of all types of aircraft, and for aviation fans.

✓ ✓ ✓

## PERSONAL EXPERIENCES

### The Toughest Fight

TARAWA: THE STORY OF A BATTLE. By Robert Sherrod. New York: Duell, Sloan & Pearce, 1944. 183 Pages. \$2.00.

Americans know, in a vague sort of way, that Tarawa was a tough battle. Many Marines and Navy personnel were killed; a large proportion of the landing force. Most of the casualties occurred on Betio. The smothering naval and air bombardment didn't wipe out the Jap defenders, who had to be dug out of cleverly constructed shelters "by hand."

Robert Sherrod landed on Betio with the first group of Marines, and stayed on the island throughout the battle. He knew, in much more than a vague way, what the conquest of Betio meant in blood and heroism. The fact that Sherrod dodged bullets, smelled dead Japs (and Marines), and saw American die is almost unimportant beside the fact that his writing is sincere and so skilled that the reader can share, to some extent, the experiences of a landing opposed by determined troops. "big pictures" for Sherrod—his book is compounded of individual men and their flashes of heroism and their sudden, lingering deaths. Betio's Marines were superb fighting men. Some of them had their momentary streaks of hesitation, many of them did the job they had to do because they "couldn't let another Marine down."

For those who expect an easy war, who think the war belongs to some one else, who think ten cents more an hour worth a drop in war production, *Tarawa* will not be welcome reading. It is too full of the stench of death. But the men who have fought, and who will fight, will recognize the reality of what Sherrod writes.

## Reynolds' Route

**THE CURTAIN RISES.** By Quentin Reynolds. New York: Random House, 1944. 353 Pages. \$2.75.

Quentin Reynolds' reputation as one of the top five or ten American reporters will be even more solid with readers of this, his latest book. Russia, North Africa, Sicily, and Salerno was his itinerary this time. As usual Reynolds kept his eyes and ears wide and heart open. Reynolds is enthusiastic in his likes, and unflinching in his hates. He likes the Russian soldier and American (except the government press department), the American and British soldier and sailor, Ernie Pyle, the jeep, Red Cross girls, *Collier's*, and cold beer on a hot day. He dislikes the Germans, Japs, and complacent Americans. For the Italians, his feeling is more of contempt than anything else.

The author has the good fortune to know the Allied leaders well enough to be able to observe them in their less formal moments, when the man, rather than the holder of office, is the dominant figure. With understanding as well as admiration in his eyes, he instills faith and confidence in our leadership. But Reynolds is at his best when he tells of some obscure Russian soldier, or of some nameless American soldier. He is sentimental without being mawkish, and informative without being pedantic. He solves no world problems, but helps us to understand our Allies as well as our own fighting men.

♦ ♦ ♦

## "The Water Bloke"

**PIPELINE TO BATTLE.** By Major Peter W. Rainier. New York: Random House, 1944. 302 Pages. \$2.50.

Major Rainier was a civilian in Cairo when the war broke out, and although he was past fifty, wrangled a commission as second lieutenant in the Royal Engineers. Not long afterwards he entered the war and Rainier's railroad building and maintenance took on a new urgency. He stayed with the Eighth Army until the German surrender in Tunisia, specializing in railroad building and water supply, with a few construction details on the side. Supplying an army in the desert is an important function, and Rainier's emphasis is on that angle of his duties, but he does not omit the big picture of the see-saw battles for North Africa that left the final issue in doubt almost up to Von Arnim's surrender.

Major Rainier writes vividly, he does not spare the lash when he details British mistakes, nor is he sparing with praise for the units that fought through three years of desert hell. Probably more than any other writer he makes it possible for the reader to understand the problems in strategy, supply, and tactics, as well as the uncomfortable life of the soldier who fights in the desert. The author's pride in his own feats becomes a bit irritating at times—but they were accomplishments of a high order, and it took a man with self-confidence to cut through red tape and inertia to do what he did. The Eighth Army had some times the Germans didn't.

♦ ♦ ♦

## Jungle War

**WINGATE'S RAIDERS.** By Charles J. Rolo. New York: Random House, 1944. 197 Pages; Illustrated. \$2.50.

At this time, most of us have heard of Brigadier Wingate and his unit of British soldiers and airmen who gave the Japs headaches in Burma. *Life* and the daily papers have told us of the story—how the force shoved off into Jap-held territory and tore up railroads, destroyed bridges, and in general

## GUNS from the inside out

The  
BASIC MANUAL  
OF  
MILITARY  
SMALL ARMS

A COMPLETE GUIDE TO  
THE WEAPONS OF THE  
U. S., ITS ALLIES AND  
ITS AXIS FOES \$2.00

AN INVALUABLE TOOL FOR  
AMERICAN SOLDIERS OF  
THE PRESENT AND FUTURE

• This is the only book of its kind on the market. It gives complete specifications and illustrated details of operation on all the important small arms in use in the world today. Weapons of fourteen nations are pictured and described. Working drawings and photographs—More than 400 of them—give you the full story of each gun without reading pages of technical jargon. Full instructions on the use of small arms, and vital information on disassembling and assembling these weapons in the field. If you capture a Japanese or German machine gun can you make it work? This book says how—and how.

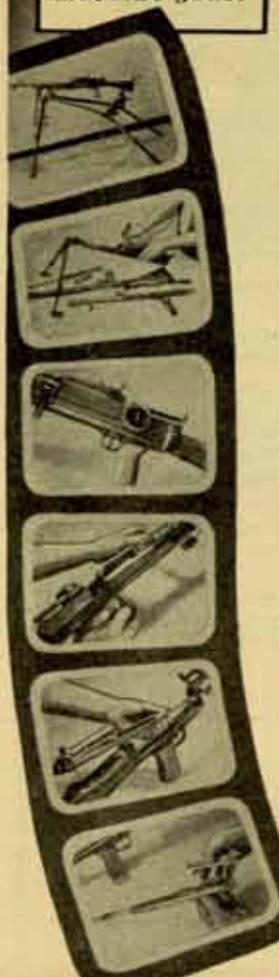
**United States Infantry Weapons**—Garand Semi-Automatic Rifle, Springfield Rifle, American Enfield Rifle, the new Winchester Semi-Automatic Carbine, .45 Colt Automatic, New Service .45 Auto, Smith & Wesson .45 Army, Winchester (or Remington) Riot Gun, Reising Gun, Tommy Gun, Browning Machine Rifle, Johnson Machine Rifle, Lewis Gun, Browning Machine Gun and Browning .50.

**Great Britain Infantry Weapons**—.303 S. M. L. E. Short Rifle Magazine Lee-Enfield, .303 Pattern '14 Enfield, .303 Rifle No. 4, Boys' .55 Anti-Tank Rifle, .455 Webley Revolver, .38 Caliber Revolver No. 2, .455 Webley Automatic Pistol, Tommy Gun, 9 mm Sten Gun, Bren Light Machine Gun, British Lewis Gun, .303 Hotchkiss and Vickers Gun.

**Russian and French Infantry Weapons**—All operational and instruction data on seven Russian and eight French weapons of battle proved maximum effectiveness and common usage.

**Axis Infantry Weapons**—Up-to-the-minute technical details on fourteen German, nine Japanese and eight Italian small arms which American troops might need to use in emergencies. German Luger (Parabellum) Automatic, Mauser 7.63 mm Pistol, Walther Automatic, Steyr-Solothurn Machine Pistol, Mauser Machine Pistol, Erma Machine Pistol, Neuhausen Machine Pistol, Bergmann Machine Pistol, 7.92 mm 41 and 41-W Rifle, Gewehr 42 Automatic Rifle, Mauser Rifle, 7.92 mm Light Machine Gun, Japanese Nambu 8-mm Automatic, Arisaka 6.5 mm Rifle, Nambu Machine Rifle, 6.5 mm and 7.7 mm Light Machine Gun, Hotchkiss Heavy Machine Gun.

• Hundreds of sparkling photos pointed up by graphic text showing how to use, maintain, disassemble and assemble all rifles, pistols, and machine guns.



KNOW YOUR  
WEAPONS—  
and the ENEMY'S



COAST ARTILLERY JOURNAL

631 Pennsylvania Ave., N. W., Washington 4, D. C.

# Essential Books

## THE OFFICER'S GUIDE

• **THE OFFICER'S GUIDE** needs no introduction for those who know their way around in the Army. It is the complete, authoritative story on **everything** the officer must know or know how to find out. Uniforms, pay, allowances, insurance, overseas duty, command—in fact, nothing has been left out of what the **Infantry Journal** calls "The soundest and most complete handbook for the officer."

Latest edition, fully illustrated and indexed ... \$2.50

★

## COMPANY ADMINISTRATION and Personnel Records

By **LT. COL. C. M. VIRTUE**

• Paper work is more important now than it has ever been—there is more of it and less time in which to do it. There are two ways of keeping up with paper work:

You can mull over pages of regulations and follow complicated changes through paragraphs of 1b. (3) (e) 4 until you become lost, or

You can do it the quick easy, authoritative way—with **COMPANY ADMINISTRATION**.

**COMPANY ADMINISTRATION** is the complete, thorough, timely book that gives all the answers to every unit administrative and personnel question. Only in **COMPANY ADMINISTRATION** will you find the latest regulations and procedures explained and illustrated so clearly that unit paperwork becomes a quick routine job instead of a constant perplexity. It is a completely indexed reference for the unit clerk, the noncom and the officer.

Constant revisions keep **COMPANY ADMINISTRATION** in step with Army regulations and miles ahead of any other work.

Durable paper binding ..... \$1.50  
Full cloth binding ..... \$2.00

★

## ARMY FOOD AND MESSING

REVISED EDITION

• "Food just like Mother used to cook" may be setting the sights a bit high for the army mess, but not much . . . Hot chow at the right time is just as important to fighting men as ammunition. This invaluable book gives "More information than I'll ever need . . . and it will save thumbing through a whole pile of FM's and TM's" one Lieutenant operating a 650 man mess wrote us enthusiastically.

Mess and kitchen management, cooking and sanitation, food inspection and recipes . . . in fact, **anything** you want to know about the mess is in this book. You also get 331 army-tested recipes, over 70 illustrations, mess account forms, table of ingredients and a minimum standard ten day menu.

Revised edition, 400 pages, illustrated ..... \$2.50

raised hob with the Jap forces, killing many, and immobilizing more. The prodigies of marching, of jungle fighting, and plain endurance made the whole story that much more thrilling and Wingate's unconventional personality and methods topped off a correspondent's dream.

Rolo has written the complete story, illustrated it with pictures, and has added some of the details that the shorter accounts necessarily missed. The marvelous cooperation of the RAF in dropping supplies where needed and when needed the painstaking training, and the superb leadership enabled the group to give the Japs the impression of a far larger force and a force that seemed to disappear at will. Different columns striking at different places at short intervals confused the enemy and caused much needless pursuit. The battles were short and furious, and the Raiders didn't come out first every time. But on the whole, the operation was a huge success tactically and strategically, and provided training for what might prove to be a training cadre for a later and greater invasion.

/ / /

### One Marine

**AL SCHMID, MARINE.** By Roger Butterfield. New York: W. W. Norton & Company, Inc., 1944. 142 Pages; Illustrated. \$2.00.

Practically every newspaper reader is familiar with parts of the story of Al Schmid, the Philadelphia Marine who assisted 200 or more Japs to attain their ambition of dying for Hirohito. Schmid's machine gun stopped a Jap advance at the Tenaru on Guadalcanal after every other man of the squad was rendered inoperative. The loss of one eye, almost total blindness in the other, and numerous wounds from grenade fragments were some of Schmid's souvenirs of the occasion.

Mr. Butterfield's book is not merely a recounting of the battle of the Tenaru; it is the life story of the youngster himself. Schmid went to work when he was fifteen, raised more than the normal amount of the less serious kinds of hell, was wild about guns and hunting, and in short, lived the life of a normal youth in the lower middle classes. He drank too much at times, and his respect for his superiors was not of the formal sort—but when the pinch came he delivered. Schmid's story could have happened nowhere but in America.

/ / /

### Cousin Ivan

**THE RUSSIAN ARMY.** By Walter Kerr. New York: Alfred A. Knopf, 1944. 250 Pages; Index. \$2.75.

This is not a treatise on the organization, equipment or training of the Russian Army. It paints a broad picture of the Russian struggle—what Russia's Army and her people are doing.

Walter Kerr was the Moscow correspondent of the *Herald Tribune*. Although not permitted to see the Russians in actual combat he did visit important battlefields immediately after the battles and talked with many great Russian generals and members of their staffs.

The great battles for Moscow and Stalingrad are analyzed and described with the aid of appropriate maps. More detailed maps would assist in following the ebb and flow of events.

The book is a story of the fighting heart, training and discipline of the Russian people—a people who know that to survive is for the time being to follow a ruthless and realistic leadership.

The Russian Army, its iron discipline, the severity of its training; the organization and activity of the guerrilla bands

Russian people sacrificing comfort, food, clothing and living on a bare minimum that the front line may have the maximum, make a vivid picture of a people at total war.

There is an interesting chapter on the Russian contest with Japan in Eastern Asia and the Russian attitude toward Japan.

### The Men Up Front

**FORWARD OBSERVER.** By Edwin V. Westrate. New York: E. P. Dutton & Co., 1944. 179 Pages. \$2.50.

The Field Artillery's Forward Observers pride themselves on their expendability. In North Africa these F. O.'s must have been very proud, because their expendability was proved. The Germans respected the artillery's accuracy and its ability to hit targets; both characteristics depended in large measure on the F.O.

This book is a slightly fictionalized, but nevertheless accurate, account of the work of Forward Observers in the North African campaign. Using one F.O. team (with the numerous placements made necessary by casualties) as his subject, the author placed the team in almost every possible situation and presented in broad terms the methods used to accomplish the team's mission. Although the book reads like a novel, it tells the work of the F.O. team in a most instructive manner.

Coast Artillerymen who ever expect to fire on land targets can learn quite a bit from this book, in addition to finding several hours of exciting reading.

### POSTWAR

#### Mirror of the Future?

**UNFINISHED BUSINESS.** By Stephen Bonsal. New York: Doubleday, Doran & Company, 1944. 291 Pages; Appendices; Glossary of Names; Index. \$3.00.

The Peace Conference that did much to bring on the present war was held in France in 1918-1919. President Wilson, a man of good will whose League of Nations plan was a blueprint for peace forever after, had Bonsal act as interpreter and confidential diarist. This book is the diary Colonel Bonsal kept confidential until now, when nothing stands between us and another peace conference except the slight problem of winning the war. Win it we shall, in spite of those who think it already won—but the war will be a picnic in relation to the peace conference, if history is really a mirror of the future. Colonel Bonsal watched, with what agony he does not say, President Wilson and Colonel House make a gallant but futile fight for a workable plan for peace. While foreign nations were sabotaging his plans for temporary advantages to themselves, Colonel Bonsal was sowing it deeply with monkey-wrenches from this end through suspicion that our sovereignty was being endangered. Wilson's conception of a League of Nations would have worked, even if his desires had been followed to the letter—but it never had a chance to be tested.

The reader's constant thought as he reads Bonsal's account of the moves at Paris and in Washington is that the whole idea of peace guaranteed by reasonable men is almost an impossible dream, since suspicion and selfishness are rife among nations. Perhaps peace forever is an impossible dream—but it would be

## Military Classics

### The Foundations of the Art of War

- A new series in uniform format at \$1.00 each of the most permanent military writings



### PRINCIPLES OF WAR

- By General Carl Von Clausewitz; annotated and with biographical foreword by Hans W. Gatzke. The historic source book from which Hitler and the German militarists have obtained the fundamentals of strategy and tactics used in over more than a century of attempted world conquest. \$1.00

### DEFENSE

- By Field Marshal Ritter Wilhelm Von Leeb. Exactly how the Germans should defend Europe, by the famous German military author. The outstanding modern contribution to the German Army and the world's military thinking. Most important piece of research in the field of strategy and tactics in modern warfare. Illustrated by maps. \$1.00

### SURPRISE

- By General Waldemar Erfurth. From ancient days to the present era of Hitler and Generals Eisenhower and Montgomery, surprise has been the most potent of military tactics. General Erfurth tells exactly how it is done, and analyzes its value under all conditions. Illustrated by maps. \$1.00

### ARMORED WARFARE

- By Major General J. F. C. Fuller. Annotated edition of F S R III—The revolutionary book first published in England in 1932. The source of German and Russian tank experts' Panzer strategy, now brought up-to-date by its famous author's illuminating and pungent comments on World War II developments. Diagrams. \$1.00

### NAPOLEON AND MODERN WAR

- "The greatest of European soldiers, the first great strategist of the western war" here tells in his famous Maxims exactly how to fight. Colonel Conrad H. Lanza, USA, has annotated the Maxims, showing how they apply to modern war, and what Napoleon would have done in 1943. \$1.00

# How To Do It—

## HOW TO WRITE A MILITARY LETTER

By **CORPORAL DAVID KLEIN**

• . . . "military correspondence can be boiled down to plain facts and plain English. . . The procedure-jumpy new officer and the procedure-disgruntled old officer, the befogged noncom and the bemused civil servant all have questions and suspicions about Army correspondence. This book is intended to ease them over the rough spots of military form and help them to take the kinks out of their writing."

Flexible binding, 135 pages .....\$1.25

## KILL OR GET KILLED

By **MAJOR REX APPLIGATE**

• In the kind of dirty fighting that has to be done in this war, the most efficient killers survive. Kill Or Get Killed is a book on the technique of efficient killing. The methods of close combat, with and without weapons, that have proved themselves in the test of experience, and are now being taught in Ranger training centers, are given in practical, straightforward language, with hundred of action photographs.

Cloth bound .....\$2.00

## MODERN JUDO

**NEW ENLARGED EDITION**

By **CHARLES YERKOW**

• MODERN JUDO is a complete course in the fundamental principles of unarmed combat. Unlike KILL OR GET KILLED, it does not discuss specific battle situations, nor the use of weapons, but it presents basic principles of body handling on which all types of close fighting rest. MODERN JUDO is illustrated with over 700 action pictures. It is the only fundamental introduction to close combat methods.

530 pages .....\$3.00

## THE SOLDIER AND THE LAW

**COLONEL JOHN A. McCOMSEY**  
**LT. COLONEL MORRIS O. EDWARDS**

**Revised Edition**

• Subject matter interestingly treated and suitably arranged, handily buttressed with supporting citations and well indexed, makes it a valuable source of helpful information for the citizen soldier and a ready reference for the professional soldier" . . . "unlike other works of its kind, this book is readable and interesting." "I believe it is one really needed in the military service." "Company commanders or platoon leaders will find it an excellent aid or text for use in garrison schools . . ."

THE SOLDIER AND THE LAW has been put to the test and these comments by readers prove better than anything how valuable a book it is for everyone in the military service.

Cloth bound, 466 pages .....\$2.00

### Opportunities to Come

THE RETURN OF OPPORTUNITY. Edited by William Kuhns. New York: Harper & Brothers, 1944. 292 Pages. \$3.00.

Approximately 150 short articles by leaders in commerce, industry, and the professions all point to the same conclusion—that neither opportunity nor progress will be dead in the post-war United States. There are frontiers to be challenged and stagnation to be overcome in almost as many directions as there are people with imagination. New needs and new wants will combine with better methods of using familiar materials to provide work and goods for all. The book is optimistic in tone, probably much of it is visionary, but it indicates that America is far from a land of lost opportunities.

✓ ✓ ✓

### Postwar Plans

WAR AND POSTWAR ADJUSTMENT POLICIES. By Bernard M. Baruch and John M. Hancock. Washington: American Council on Public Affairs. 131 Pages. Cloth \$2.00; Paper, \$1.00.

This much-discussed report is now available for reading and study.

✓ ✓ ✓

HAVE WE FOOD ENOUGH FOR ALL? By F. F. Hill and F. A. Harper. New York: Public Affairs Committee, 1944. 30 Pages; Illustrated. 10¢.

The authors say that by changing our diet to some extent from a heavy meat diet to a more vegetarian diet, we can provide a large part of the food that will be needed for the world.

✓ ✓ ✓

A MODERN FOREIGN POLICY FOR THE UNITED STATES. By Joseph M. Jones. New York: The Macmillan Company, 1944. 94 Pages. \$1.35.

This book is primarily an estimate and criticism of our State Department, its organization, and its policies.

✓ ✓ ✓

## MISCELLANY

### Sustaining Program

WASHINGTON BROADCAST. By the Man at the Microphone. New York: Doubleday, Doran & Co., 1944. 24 Pages; Index. \$2.50.

When a book is labeled "candid comment on the great and near great in the Capital," full candor deserves something better than anonymity. If we must hear of the failings of big and middling names, we readers deserve at least some inkling of the identity of our narrator. Where we might place some credence in the honesty and accuracy of one writer, we must remember that others have axes to grind. And this author, hiding behind a fictitious microphone, claims to be one of "Pershing's Boys" on page 162, and on page 201 either believes that the WAC includes nurses, or is guilty of rather sloppy writing.

The author seems to try to be fair in his appraisals, and makes few group indictments. His caustic comments are aimed at Republican and Democrat, New Dealer and Old Dealer, and his bouquets are bestowed with the same lack of prejudice. But still, we wouldn't say this was an important book.

## Hopkins to King

THE BOOK OF THE NAVY. Selected by W. Adolphe Roberts and Lowell Brentano. New York: Doubleday, Doran & Company, 1944. 302 Pages. \$3.00.

Captain Esek Hopkins, the unfortunate first Commander-in-Chief of our navy, would never recognize the craft that 1944's navy operates with such success. The men of the new navy, too, would seem strange to the old-timer—but the spirit of the men would be familiar. Today's Corsair pilot, submarine commander, destroyer skipper, or battle-wagon captain has been trained in the traditions that made the navy of the Revolutionary War and the War of 1812 the terror of larger fleets. *Esprit de corps* depends largely on tradition; the editors of this collection of real stories have mirrored our Navy's traditions from Esek Hopkins to Ernest King.

Most soldiers know their history, and names like Jones, Mifflin, Decatur, Farragut, Hobson, Dewey, and Sims are as familiar as the later names like Gatch, Fenno, and Callaghan. This selection compresses in a comparatively small volume the romance, color, and tradition of 168 years of glorious naval history. The names and the deeds have been recounted before, but seldom in such a concentrated dose.

## Spy Novel

MOST SECRET . . . MOST URGENT. By Howard Swiggert. Boston: Houghton Mifflin Company, 1944. 268 Pages. \$2.00.

A real spy thriller, with a 1941 Washington setting, this book of fiction overflows with suspense and makes a better than average stab at credibility. The central character is an American, who as head of an Allied supply mission, directs the arming of those in occupied countries who still have the will to resist the Nazi conquerors. As field work, he goes to France to see how his organization is working, a trip that is productive of a shiver for the thrilled reader. It is unfortunate that Mr. Swiggert found it necessary to inject sex interest into the story, which is the only phoney note.

## Framed in a Gun-Sight

THE JAP SOLDIER. Washington: The Infantry Journal, 1943. 125 Pages; Illustrated. 25¢.

Evenly divided between text and pictures, this book tells what makes the Jap the being, human or otherwise, that he is. His training from birth to the battle front, the government that provides that training, and the matériel he uses are all covered.

## More Grant

IT'S HARD TO KEEP STRAIGHT IN THE NAVY. By Kay Grant. New York: William Morrow & Company, 1944. 64 Pages; Illustrated. \$1.00.

Miss Grant's previous books of salty poetry, written with her tongue in her cheek and a leer in her eye, must have sold gratifyingly, for this is her third volume in what seems to be little more than a year. It isn't quite fair to Keats and Shelley to call her product poetry, and it is most unfair to Miss Grant to compare her stuff with Captain Billy's *Whiz Bang*—the truth in both cases lies somewhere short of the examples given. Anyway, if you liked the previous books, this is more of the same.

## It's Worse in Burma

THERE'S NO FRONT LIKE HOME. By Robert M. Yoder. Boston: Houghton Mifflin Company, 1944. 115 Pages. \$2.00.

The home front is having its troubles too, what with maids impossible to find or hire, rationing of different kinds, and other wartime adjustments. Mr. Yoder, with the aid of some rather broad burlesque, is half-kidding, half-serious, about the wartime dislocations on the home front. But the soldier at Anzio or Kiska need have no fears for his home folks—they're still not in danger of starving or freezing, or anything approximating these conditions. The worst of existence on the home front is still the radio commercials.

## MAGAZINES AT MONEY-SAVING PRICES

Subscribe for ALL Magazines  
Through The JOURNAL

Service Rates for Many  
Publications.

SPECIAL DISCOUNTS on orders for  
two or more publications.

Appropriately titled magazine binders  
are available through the JOURNAL.  
Prices vary with the size of the maga-  
zine; 10% discount (plus postage) in  
lots of ten or more.

The next time you order periodicals  
for the club, day room, or yourself,  
get a quotation from



The Coast Artillery Journal

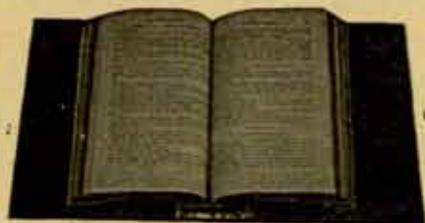
631 Pennsylvania Ave., N.W.

Washington 4, D. C.

# BINDERS

FIELD MANUAL SIZE  $5\frac{1}{4}'' \times 8\frac{1}{4}''$

TECHNICAL MANUAL SIZE  $6\frac{1}{4}'' \times 10\frac{1}{4}''$



- ✓ MANUALS DO NOT GET LOST.
- ✓ KEEPS MANUALS IN SYSTEMATIC ORDER.
- ✓ MANUALS REMAIN IN GOOD CONDITION.
- ✓ NO HOLE-PUNCHING NECESSARY.
- ✓ INEXPENSIVE.
- ✓ RUGGED, DURABLE.
- ✓ EASY TO OPERATE.

Needed by ALL headquarters, from battery to army.

**\$1.50**

(10% discount in lots of 10 or more,  
f. o. b. Washington)

## Two Coast Artillery Corps Marching Songs

### CRASH ON! ARTILLERY

The official song for the entire Coast Artillery Corps, adopted by the United States Coast Artillery Association.

Band - 75 cents

Piano Solo - 50 cents

### SONG OF THE AAA

The brand new march for the AAA. Winning march of the contest held in 1943. Music by Warrant Officer Henry Johnson; words by Staff Sergeant Herbert L. Miller.

Band - 75 cents

Piano Solo - 50 cents

## FOUR ACES — In Any Soldier's Hand

### INFANTRY DRILL REGULATIONS

(New CAC Edition)

COMPLETE IDR (contains all drills applicable to CAC).

50¢

### SOLDIER'S HANDBOOK (New CAC Edition)

The BASIC book for every enlisted man.

11 to 50 copies:  
21¢ each

25¢

51 or more copies:  
19¢ each

### HOW TO SHOOT THE U. S. ARMY RIFLE

Modern teaching methods applied to the "soldier's best friend."

11 to 50 copies:  
21¢ each

25¢

51 or more copies:  
19¢ each

### SCOUTING AND PATROLLING

The same effective teaching methods employed in "How to Shoot" makes this the outstanding book on its subject "at any price."

11 to 50 copies:  
21¢ each

25¢

51 or more copies:  
19¢ each

THE COAST ARTILLERY JOURNAL,  
631 Pennsylvania Avenue, N.W.,  
Washington 4, D. C.

Please send the following books:

### REMARKS, OTHER ITEMS

I inclose remittance in the amount of \$-----

Send bill to Battery Fund.  
(For unit orders only.)

Please charge to my account.

Name (Please Print)

(Street address or box number)

(Town — Post)

(City and State)

(CA244)

# BOOKS

In the Present, Prepare for the Future

If the book you want is not listed here, the Journal can get it for you.

(Titles marked \* for sale to members of the Armed Services only)

## Military Training

Reading for the Soldier	1.00
Problems for Small Units	1.00
System of Teaching Drill	.75
Essentials of Infantry Training	
<i>Cloth edition</i>	2.00
<i>Paper edition</i>	1.50
Service Regulations & Staff Officer's	
Field Manual, Combined	1.25
How to Use Your Eyes at Night	.10
Leadership for American Army Leaders	
(Col. Munson)	1.00
Aerial Photo Reading Complete	1.00
Psychology for the Fighting Man	
<i>Cloth edition</i>	1.50
<i>Fighting Forces edition</i>	.25
Edman Dodd (C. S. Forester)	.25
Control (Col. Wood)	1.50
Patrolling	.25
Spotter	1.00
Automatic Arms (Johnson)	5.00
Training: Handbook for Instructors	.25
<i>Get Tough—For Men (Fairbairn)</i>	1.00
<i>Get Tough—For Women (Fairbairn)</i>	.75
How to Shoot the U. S. Army Rifle	.25
How to Prepare for Military Fitness	
(D'Eliscu)	1.96
Drill Regulations—CA Edition	.50
<i>Get Tough—For Men (Fairbairn)</i>	1.00
Machine Gunner's Handbook	.50
Aerial Photo Reading, Complete	1.00
Physical Training (Raycroft)	3.00
Soldier's Handbook	1.00
Medical Manual	4.50
Preventive Medicine (Dunham)	3.25
Military Ski Manual (Harper)	2.00
Modern Judo (Yerkow)	3.00
Soldier's Handbook—CA Edition	.25
Preventive Maintenance (Motor Vehicles)	1.00
Psychology for the Fighting Man	.25
Artillery (A complete textbook)	3.00
Patrolling	.25
Defense Force Manual	1.00
Planes of the Axis (Cooke)	2.75
What's That Plane?	.25

## Psychology & Leadership

Americans vs. Germans 1917-18	.25
The Battle is the Pay-Off (Major Ingersoll)	
<i>Cloth edition</i>	2.00
<i>Fighting Forces edition</i>	.25
Command and Generalship (Gen. Wavell)	1.00
Psychological Warfare	3.00
Leadership (Gen. Holdridge) (AG School)	.10
Leadership for U. S. Army Leaders	
(Col. Munson)	1.00
The Battle (Col. Thompson)	.25
Leadership in War (Mira)	2.75
Psychology for the Fighting Man, <i>paper</i>	.25
<i>cloth</i>	1.50

## Headquarters & Administration

Administration of the Army (AG School)	.10
Army Clerk (AG School)	.75
Army Clerk: Instructor's Supplement	1.00
Food & Messing (Mess Management)	2.50
Army Personnel System (AG School)	.10

Boards of Officers (AG School)	.20
Co. Administration & Personnel Records	
<i>paper</i>	1.50
<i>cloth</i>	2.00
Battery Duties: A Checklist	.25
General & Special Staffs (AG School)	.10
Military Correspondence Checklist (AGS)	.10
Military Preventive Medicine (Dunham)	3.25
Orders: Guide to Preparation (AGS)	.50
Preparation & Use of Efficiency Reports	.10
SOP for Regimental Adjutant's Office	.10
Travel: Guide to Regulations (AGS)	.60
How to Write a Military Letter	1.25

## Weapons & Weapons Training

A Manual of Military Small Arms (Smith)	2.00
How to Shoot the U.S. Army Rifle	.25
Ammunition (Johnson & Haven)	
(with 100 tables)	5.00
History of Automatic Arms (Johnson & Haven)	5.00
Machine Gunner's Handbook (Col. Coates)	.50
Military & Sporting Rifle Shooting	4.50
Story of Weapons & Tactics	
(Wintringham)	2.25
The Tools of War (Newman)	5.00
What You Should Know About	
Our Arms & Weapons (Major Hicks)	2.50

## Air Forces Study

The Air Future: Jobs Ahead in Aviation	2.75
Air Navigation (Zim)	3.00
Aircraft Navigation (Stewart & others)	2.00
Aircraft Recognition (British, Nazi, Italian)	.25
Basic Math for Pilots & Crews	2.00
Basic Physics for Pilots & Crews	1.65
Elements of Radio (Marcus)	4.00
Navigation for Mariners & Aviators	5.00
Navigation (Kingsland & Seager)	1.00
Primer of Celestial Navigation (Favill)	2.00
What's That Plane (U.S. & Jap)	.25

## Gas Warfare

Gas Warfare (Gen. Waitt)	
<i>Cloth edition</i>	2.75
<i>Fighting Forces edition</i>	.25

## Medical

Burma Surgeon (Col. Seagrave)	3.00
Handbook for Nurses Aides (Orbison)	2.00
Medical Soldier's Handbook	1.00
Military Preventive Medicine (Dunham)	3.25
Nurses in Action (Col. Flikke)	2.50
What You Should Know About Wartime	
Medicine (Darnall & Cooper)	2.50

## Military Intelligence

Combat Intelligence (Gen. Schwien)	2.00
S-2 in Action (Col. Thomas)	1.50
What You Should Know About Spies & Saboteurs (Irwin & Johnson)	2.50

## Motors & Drivers

Driver Training: Handbook for Instructors	.25
Keep 'em Rolling: Handbook for Drivers	.50
Preventive Maintenance	1.00

## Physical Training—Sports

Baseball: How to Play It (Jessee)	1.25
Basketball: How to Play It (Murphy)	1.25
Boxing: Skills & Techniques (Haislet)	1.25
Kill or Get Killed (Applegate)	2.00
Military Ski Manual (Harper)	2.00
Modern Judo (Yerkow)	3.00
Softball: How to Play It (Noren)	1.25
Sports & Games (Keith)	2.50
Sports as Taught & Played at West Point	
(Col. Baumer)	2.00
Touch Football (Col. Grombach)	1.25
Wrestling: Skills & Techniques	
(Gallagher)	1.25
Volleyball: How to Play It (Laveaga)	1.25
You Must Be Fit (WAC Physical Training)	
<i>cloth edition</i>	1.00
<i>paper edition</i>	.50

## Military Law

Articles of War Annotated (Tillotson)	2.50
Court-Martial Practical Guide (McCarthy)	1.00
Manual for Courts-Martial (1928)	1.00
Manual of Martial Law (Wiener)	2.00
Military Justice for the Field Soldier	
(Wiener)	1.00
Military Law—Catechism	.50
Military Law and Court-Martial Procedure	
(Munson and Jaeger)	1.50
Occupation of Enemy Territory	1.25
Soldier and the Law (McComsey and Edwards)	2.00

## Military Thought

The German Army (Rosinski)	3.00
Science at War (Gray)	3.00
Defense (General von Leeb)	1.00
The Framework of Battle (Col. Burr)	3.00
How the Army Fights (Capt. Limpus)	3.00
Lifelines of Victory (Harris)	2.00
The Living Thoughts of Clausewitz	
<i>Cloth edition</i>	1.50
<i>Fighting Forces edition</i>	.25
MacArthur on War	3.00
Makers of Modern Strategy	3.75
Maneuver in War (Gen. Willoughby)	3.00
Masters of Mobile Warfare (Col. Colby)	2.00
Napoleon and Modern War (Col. Lanza)	1.00
The Nature of Modern Warfare	
(Capt. Falls)	1.25
On War (Clausewitz full text)	1.45
Principles of War (Clausewitz Outline)	1.00
Roots of Strategy (Gen. Phillips)	3.00
Sergeant Terry Bull: His Ideas on War	.25
Studies on War: From Military Affairs	.25
Surprise in War (General Erfurth)	1.00
What You Should Know About Modern	
War (Pratt)	2.50

## Notebooks

Army Officer's Notebook	1.00
Platoon Record Book	.50
Squad Record Book	.25

## Mathematics

Practical Arithmetic (Palmer)	1.25
New School Algebra (Wentworth)	1.50
Plane Geometry (Palmer)	1.32
Plane Trigonometry with Tables (Kells)	2.40

Plane and Spherical Trigonometry (Kells, Kern and Bland) . . . . .	2.75
Mathematics for the Million (Hogben) . . . . .	3.75
Wartime Refresher in Fundamental Math	1.40
Introductory Artillery Mathematics and Antiaircraft Mathematics (Levy) . . . . .	2.50
Exterior Ballistics (Moulton) . . . . .	4.00
Mathematics for Electricians and Radiomen (Cooke) . . . . .	4.00
Course in the Slide Rule and Logarithms (Hills) . . . . .	.75
Five-place Logarithmic and Trigonometric Tables . . . . .	1.00
Elementary Mathematics in Artillery	
Fire (Thomas) . . . . .	2.50
Exterior Ballistics (Hayes) . . . . .	1.00

### Navigation

Navigation for Mariners & Aviators . . . . .	5.00
Navigation (Kingsland & Seager) . . . . .	1.00
Primer of Celestial Navigation (Favill) . . . . .	2.00
Elements of Navigation . . . . .	1.25

### Radio

Elements of Radio (A. and W. Marcus) . . . . .	4.00
Fundamentals of Radio (Everitt) . . . . .	5.00
Radio Amateur's Handbook (Standard Edition) . . . . .	1.00
Radio Amateur's Handbook (Defense Edition) . . . . .	1.00
Modern Radio Servicing (Ghirardi) . . . . .	5.00
Radio Handbook . . . . .	2.25
Roger Wilco: Radio for Flyers . . . . .	2.00

### Sciences

Piloting, Seamanship and Small Boat Handling (Chapman) . . . . .	2.50
Short Course in Surveying (Davis and Kelly) . . . . .	2.50
Military and Naval Maps and Grids (Flexner and Walker) . . . . .	1.00
Elements of Physics (Smith) . . . . .	3.75
Fundamentals of Machines (Cushing) . . . . .	1.24
Introduction to Meteorology (Peterson) . . . . .	2.50
A Start in Meteorology (Spitz) . . . . .	1.56
Cryptography (Smith) . . . . .	2.50
Elements of Ordnance (Hayes) . . . . .	6.50
Science at War (Gray) . . . . .	3.00
Handbook of Elementary Physics (Lindsay) . . . . .	2.25
Secret & Urgent: Story of Codes & Ciphers . . . . .	1.00
A Treasury of Science (Shapley) . . . . .	3.95
Wartime Refresher in Fundamental Math . . . . .	1.40

### What the War is About

Background of our War (War Dept.) . . . . .	2.00
Christianity & Social Order (Temple) . . . . .	.25
Empire in the Changing World (Hancock) . . . . .	.25
One World (Wendell Willkie) . . . . .	
<i>Cloth edition</i> . . . . .	2.00
<i>Paper edition</i> . . . . .	1.00

### Use of Air Power

Air Power & Total War (Cy Caldwell) . . . . .	2.50
Aircraft Recognition (British, Nazi, Italian) . . . . .	.25
Combat Aviation (Ayling) . . . . .	2.00
Douhet & Aerial Warfare (Col. Sigaud) . . . . .	1.75
Field of Action of Aircraft . . . . .	1.50
Fighter Facts and Fallacies . . . . .	1.25
Horizons Unlimited (History of Aviation) . . . . .	3.75
What's That Plane? (U.S. & Jap) . . . . .	.25
Winged Mars: The Luftwaffe 1870-1914 . . . . .	2.50
Winged Warfare (Gens. Arnold & Eaker) . . . . .	3.00

### Airborne Troops

He's in the Paratroops Now (Rathbone) . . . . .	2.50
Modern Battle (Col. Thompson) . . . . .	.25
Paratroops: Airborne Tactics (Miksche) . . . . .	2.50

### Commandos & Amphibious War

Amphibious Warfare (Adm. Keves) . . . . .	1.50
Combined Operations: Commando Raids . . . . .	2.00
Dress Rehearsal: The Dieppe Raid . . . . .	2.00
Guerrilla Warfare (Yank Levy) . . . . .	.25
New Ways of War (Wintringham) . . . . .	.25

### Mechanized Warfare

Armies on Wheels: Mechanized War . . . . .	2.50
Armored Warfare: Lectures on FSR III . . . . .	1.00
The Army of the Future (Gen. DeGaulle) . . . . .	2.00
Blitzkrieg: Armies on Wheels (Marshall) . . . . .	.25
Blitzkrieg: Its History (Col. Marshall) . . . . .	2.00
Fighting Tanks, 1916-1932 . . . . .	2.50
Guerrilla Warfare (Yank Levy) . . . . .	.25
Machine Warfare (Gen. J. F. C. Fuller) . . . . .	
<i>Cloth edition</i> . . . . .	2.50
* <i>Fighting Forces edition</i> . . . . .	.25
Tank-Fighter Team: France 1940 (Gerard) . . . . .	.25
Modern Battle (Col. Thompson) . . . . .	.25
War on Wheels: History of Mechanized War . . . . .	2.00

### Naval Warfare

America's Navy in World War II (Cant) . . . . .	3.75
Sea Power in the Machine Age (Lt. Brodie) . . . . .	3.75
They Were Expendable: The PT Boats . . . . .	2.00
Toward a New Order of Sea Power (Sprout) . . . . .	3.75
What You Should Know About Modern War (Pratt) . . . . .	2.50
What You Should Know About Submarine Warfare (Woodbury) . . . . .	2.50

### War History & Geopolitics

Geopolitics (Strausz-Hupé) . . . . .	2.75
Global Warfare (Mowrer & Rajchman) . . . . .	1.00
History of the War in Maps, in Pictographs, in Words (Modley) . . . . .	.25
Report on the Army 1939-43 (Gen. Marshall) . . . . .	
<i>Cloth edition</i> . . . . .	1.50
* <i>Fighting Forces edition</i> . . . . .	.25
The War in Outline 1939-43 . . . . .	.25

### China, Burma, India

The Changing Far East (Johnstone) . . . . .	.25
Burma Surgeon (Col. Seagrave) . . . . .	3.00
China Handbook, 1937-1943 . . . . .	5.00
Flying Tigers: Chennault's Squadron . . . . .	2.50
Introduction to India (Morales & Stimson) . . . . .	2.00
Retreat with Stilwell (Belden) . . . . .	3.00
They Shall Not Sleep (Stowe) . . . . .	3.00
Thirty Seconds Over Tokyo (Capt. Lawson) . . . . .	2.00

### The War in France

Blitzkrieg: Armies on Wheels (Marshall) . . . . .	.25
Engineers in Battle (Col. Thompson) . . . . .	1.50
Modern Battle (Col. Thompson) . . . . .	.25
Tank-Fighter Team 1940 (Gerard) . . . . .	.25
War in the West (The Battle of France) . . . . .	2.50

### North African War

Pipeline to Victory (Major Rainier) . . . . .	2.50
Assignment to Nowhere: Battle for Tunisia . . . . .	2.75
The Battle is the Pay-Off (Maj. Ingersoll) . . . . .	
<i>Cloth edition</i> . . . . .	2.00
* <i>Fighting Forces edition</i> . . . . .	.25
Conquest of North Africa 1939-42 . . . . .	3.00
Don't Blame the Generals (Moorehead) . . . . .	3.50
The End in Africa (Moorehead) . . . . .	2.75
Here is Your War (Ernie Pyle) . . . . .	3.00
One Continent Redeemed (Ramsey) . . . . .	2.50
Tunis Expedition: Americans in Battle . . . . .	2.00

### The Pacific War

c/o Postmaster (Cpl. St. George) . . . . .	2.00
*The Fight at Pearl Harbor (Clark) . . . . .	.25
GI Jungle: New Guinea (CWO Kahn) . . . . .	2.00
Guadalcanal Diary (Tregaskis) . . . . .	
<i>Cloth edition</i> . . . . .	2.50
* <i>Fighting Forces edition</i> . . . . .	.25
Highway to Tokyo (Rosenfarb) . . . . .	1.25
I Saw the Fall of the Philippines (Romulo) . . . . .	3.00
Men on Bataan (Hersey) . . . . .	2.50
Southwest Passage: Battle of the Solomons . . . . .	3.00
They Call it Pacific (Clark Lee) . . . . .	3.00
They Were Expendable: The PT Boats . . . . .	2.00
Thirty Seconds Over Tokyo (Capt. Lawson) . . . . .	2.00
(See also The Enemy: Japan; Air Warfare Against Japan)	

### The Enemy: Germany

The Axis Grand Strategy . . . . .	3.75
The German Army (Rosinski) . . . . .	3.00
Berlin Diary (Shirer) . . . . .	3.00
Blitzkrieg: Armies on Wheels (Marshall) . . . . .	.25
The German Soldier: His Training for War . . . . .	2.00
The Guilt of the German Army (Fried) . . . . .	3.50
Hitler's Second Army (Vagts) . . . . .	
<i>Cloth edition</i> . . . . .	1.00
* <i>Fighting Forces edition</i> . . . . .	.25
Last Train from Berlin (Smith) . . . . .	2.75
Men Behind the War (Steel) . . . . .	2.00
Modern Battle (Col. Thompson) . . . . .	.25
Pattern of Conquest: German Plans . . . . .	2.50
We Cannot Escape History (Whitaker) . . . . .	2.75

### The Enemy: Japan

Hong Kong Aftermath: Prisoners of Japs . . . . .	2.75
How the Jap Army Fights . . . . .	2.00
In Peace Japan Breeds War (Eckstein) . . . . .	2.50
The Jap Soldier: Training for Conquest . . . . .	2.00
Japan's Military Masters (Lory) . . . . .	
<i>Cloth edition</i> . . . . .	2.50
* <i>Fighting Forces edition</i> . . . . .	.25
Men Behind the War (Steel) . . . . .	2.00
Thirty Seconds Over Tokyo (Capt. Lawson) . . . . .	2.00
With Japan's Leaders (Moore) . . . . .	2.75

### Air Warfare Against Germany

Target Germany: The VIII Air Force . . . . .	
<i>Cloth edition</i> . . . . .	2.00
<i>Paper edition</i> . . . . .	1.00
Air Offensive Against Germany (Michie) . . . . .	2.00
Aircraft Recognition (British, Nazi, Italian) . . . . .	.25
Malta Spitfire (Beurling) . . . . .	2.50
The Use of Air Power (Lt. Blunt) . . . . .	1.00
War Eagles: The U.S. Squadron of the RAF . . . . .	3.75
The War in the Air 1939-41 (Garnett) . . . . .	3.50

### Air Warfare Against Japan

Flying Guns: Naval Scouting Squadron 6 . . . . .	2.00
Flying Tigers: Chennault's Squadron . . . . .	2.50
God is My Co-Pilot (Col. Scott) . . . . .	2.50
Thirty Seconds Over Tokyo (Capt. Lawson) . . . . .	2.00
What's That Plane? (U.S. & Jap) . . . . .	.25

### Our Armed Forces

Short History of the Army & Navy (Pratt) . . . . .	2.00
Our Armed Forces: A Description . . . . .	.25

### Our Army

America in Arms (Gen. Palmer) (History of our Military Policy) . . . . .	2.00
Building an Army: How it is Mobilized . . . . .	1.00
Going to OCS: Guide for Candidates . . . . .	1.00
Handbook for Army Wives & Mothers . . . . .	1.00
History of the U. S. Army (Col. Gano) . . . . .	3.00
How to Become an Officer (Col. Vollmer) . . . . .	1.00
Indian-Fighting Army (Major Downey) . . . . .	1.50
The Officer's Guide . . . . .	2.50
Our Soldiers Speak: 1775-1918 . . . . .	3.50
Report on the Army 1939-43 (Gen. Marshall) . . . . .	
<i>Cloth edition</i> . . . . .	1.50
* <i>Fighting Forces edition</i> . . . . .	.25
The U. S. Army (Col. Ewert) . . . . .	1.00
The U. S. Army in War & Peace (Spaulding) . . . . .	6.00
The Waacs (Shea) . . . . .	2.00
Weapons for the Future (Johnson & Haven) . . . . .	2.00
West Point (Col. Baumer) . . . . .	5.00
West Point Today (Banning) . . . . .	2.00
What You Should Know About the Army (Lt. Ford) . . . . .	2.00
What You Should Know About the Army Engineers (Col. Thompson) . . . . .	2.00
What You Should Know About Army Ground Forces (Col. Greene) . . . . .	2.00
What You Should Know About The Signal Corps (Davis & Fassett) . . . . .	2.00

<b>Our Navy</b>	
Metropolis Today (Banning) .....	2.50
Command at Sea (Capt. Cope) .....	2.75
Influence of Sea Power Upon History (Mahan) .....	4.50
The Fleet Today (Banning) .....	2.50
Naval Officer's Guide (Com. Ageton) .....	3.00
The Navy Has Wings (Pratt) .....	2.75
War of the Flat-Tops: The Lexington .....	3.00
What You Should Know About the Coast Guard (Powell) .....	2.50
What You Should Know About the Marines (Capt. Craig) .....	2.50
What You Should Know About the Navy (Baldwin) .....	2.50

<b>Our Air Forces</b>	
America's Fighting Planes in Action .....	2.50
The Army Flyer (Gens. Arnold & Eaker) .....	2.50
Wings Away: The Bomber Team .....	2.50
Living Health (Kafka) .....	2.00
Up on the Ground Up: Training Pilots .....	2.50
Our Army Grew Wings (Gens. Chandler & Lahm) .....	3.75
The Man Behind the Flight (Jordanoff) .....	3.50
Up Alone, Mister (Lt. Hibbits) .....	2.50
What You Should Know About Our Air Forces (Col. Hartney) .....	2.50
What's That Plane? (U. S. & Jap) .....	.25
Winged Victory (A Play by Moss Hart) .....	2.00

<b>Great Britain &amp; Dominions</b>	
The English People: Their History .....	3.00
Producing Australia (Grattan) .....	3.00
Introduction to India (Morzes & Stimson) .....	2.00
New Zealand (Nash) .....	3.50
The Making of Modern Britain (Brebner & Nevins) .....	2.50

<b>The Netherlands &amp; Dominions</b>	
The Netherlands (Landheer) .....	5.00

<b>Near East</b>	
East and West of Suez (Badeau) .....	2.50

<b>Middle East</b>	
The Middle East (Ben-Horin) .....	3.00

<b>Far East</b>	
The Changing Far East (Johnstone) .....	.25
(See also China, Burma, India)	

<b>USSR</b>	
The Growth of the Red Army (White) .....	3.75
War in the Snow: War in Finland .....	2.50
War in Moscow (Davies) .....	5.00
The Red Army (Berchin & Ben-Horin) .....	3.00
War (Sir Bernard Pares) <i>new edition</i> .....	.25
The Russian Army (Kerr) .....	2.75
Months That Changed the World (Hesse) .....	3.00

<b>United States</b>	
America in Arms (Gen. Palmer) History .....	2.50
of our Military Policy .....	.25
America's Foreign Policies .....	.25
America's Strategy in World Politics .....	5.75
Permanent Victory (Johnson & Haven) .....	2.50
War: History of our Mil. Policy .....	2.50
History of the U. S. (Devins & Commager) .....	.25
History of American Democracy (Hicks) .....	5.50
Cover: Quislings in the U. S. .....	3.50
Foreign Policy (Walter Lipmann) .....	1.50
U. S. & Its Place in World Affairs .....	3.25
for the Future (Johnson & Haven) .....	.25
What You Should Know About Civilian Defense (Binger & Railey) .....	2.50

<b>South America</b>	
Latin America (Raushenbush) .....	.25

<b>Mexico</b>	
Mexico: Making of a Nation (Herring) .....	2.50

<b>Guide Books &amp; Atlases</b>	
Global War (Mowrer & Rajchman) .....	1.00
Goode's School Atlas .....	4.40
How to Live in the Tropics (Hunt) .....	2.00

<b>Going Overseas</b>	
*How to Abandon Ship (Richards & Banigan) .....	2.50
What to do Aboard the Transport .....	1.50
<i>Cloth edition</i> .....	.25
<i>Fighting Forces edition</i> .....	.25
(See also titles under Great Britain; North Africa; China, Burma, India, etc.)	

<b>Biography &amp; Experiences</b>	
Allenby (Gen. Wavell) .....	3.00
Americans vs. Germans 1917-18 .....	.25
The Army Life (CWO Kahn) .....	1.75
<i>Cloth edition</i> .....	.25
<i>Fighting Forces edition</i> .....	.25
Genghis Khan (Harold Lamb) .....	.25
Great Soldiers of the First World War .....	.25
A Roving Commission (Winston Churchill) .....	1.75
See Here, Private Hargrove .....	.25
Signposts of Experience 1917-19 (Gen. Snow) .....	2.75

<b>Early American Wars</b>	
American Campaigns: 1690-1899, 2 vols. .....	8.00
Patriot Battles 1775-1782 (Col. Azoy) .....	.25
Soldiers in the Philippines, 1898-1902 .....	.25
The War of 1812 (Henry Adams) .....	3.00
Short History of the Army & Navy (Pratt) .....	.25

<b>The Civil War</b>	
Abraham Lincoln & the Fifth Column .....	3.50
<i>Cloth edition</i> .....	.25
<i>Fighting Forces edition</i> .....	.25
American Campaigns: 1690-1899, 2 vols. .....	8.00
Conflict: The Civil War (Milton) .....	3.50
<i>Cloth edition</i> .....	.25
<i>Fighting Forces edition</i> .....	.25
Lee's Lieutenants (Freeman) 2 vols., each .....	5.00
Our Soldiers Speak: 1775-1918 .....	3.50
Short History of the Army & Navy (Pratt) .....	.25

<b>The First World War</b>	
Allenby (Gen. Wavell) .....	3.00
America in Arms: Our Military Policy .....	.25
Americans vs. Germans 1917-18 .....	.25
Combat Intelligence (Gen. Schwiens) .....	2.00
Fighting Tanks 1916-1932 .....	2.50
Great Soldiers of the First World War .....	.25
How Our Army Grew Wings (Generals Chandler & Lahm) .....	3.75
Infantry in Battle: Examples from War .....	3.00
The Lost Battalion (Johnson & Pratt) .....	.25
Signposts of Experience (Gen. Snow) .....	2.75
Winged Mars: The Luftwaffe 1870-1914 .....	2.50

<b>Military Histories</b>	
Decisive Battles, 331 B.C. to 1938 (Fuller) .....	4.50
Decisive Battles of the World (Creasy) .....	3.00
Masters of Mobile Warfare (Col. Colby) .....	2.00
175 Battles, 490 B.C. to 1937 (Shaw) .....	2.00
Warfare (Early Times to Frederick) .....	3.00
World's Military History (to 1918) .....	3.00

<b>Insignia &amp; Identification</b>	
Identification: Insignia of All Armies .....	2.00
Insignia of the Services (Brown) .....	1.50
Military & Naval Recognition Book .....	2.50
The U. S. Army (Col. Ewert) .....	1.25

<b>Language Books</b>	
Army Talk (Soldier Language) .....	2.00
Blitz French (Nicot) .....	.75
Blitz German (Brandl) .....	.75
Civil & Military German (Pfeffer) .....	2.50

Current Spanish (Martinez) .....	1.00
Easy Malay Words & Phrases (Mendleson) .....	1.00
Elementary Japanese (Col. Sullivan) .....	2.50
<i>Cloth edition</i> .....	1.00
<i>*Fighting Forces edition</i> .....	1.00
English for the Armed Forces .....	1.50
French Dictionary for the Soldier .....	.50
German Dictionary for the Soldier .....	.50
How to Say it in Spanish .....	.75
Italian Dictionary for the Soldier .....	.50
Italian Sentence Book for the Soldier .....	.25
Modern Military Dictionary (Col. Garber & Col. Bond) .....	2.50
Speech for the Military .....	1.20
Conversational Spanish .....	1.25
Conversation .....	1.50
Pan-American Spanish—Self-taught (Ibarra) .....	2.50
Introductory Portuguese Grammar .....	1.90
Brazilian Portuguese Self-Taught (Ibarra) .....	2.50
Modern English (Book II) (Emerson & Bender) .....	1.10
Words (Spelling) (SoRelle and Kitt) .....	.50
Palmer Method of Business Writing (Penmanship) .....	.30
Applied Business English and Business Correspondence (Hager and SoRelle) .....	1.00
Elementary Japanese (Sullivan) .....	2.50
Lehrbuch der Deutschen Sprache .....	1.72

<b>Personal Affairs</b>	
Handbook for Army Wives & Mothers .....	.25
Army Guide for Women (Dilts) .....	2.50
The Army Wife (Shea) .....	2.50
Army Woman's Handbook (Collins) .....	1.75
The Fourth Horseman: Legal Provisions .....	1.00
Military Personnel & Their Dependents (AGO) .....	.10
The Navy Wife (Pye & Shea) .....	2.50

<b>Reference Books</b>	
History of the War in Maps, in Pictographs, in Words (Modley) .....	.25
Identification (Insignia of all Armies) .....	2.00
Index to Army Regulations .....	.65
Military & Naval Recognition Book .....	2.50
U. S. Government Manual (Summer 1943) .....	1.00
The War in Outline 1939-43 .....	.25

<b>Anthologies &amp; Readers</b>	
As You Were: Woolcott's Reader .....	1.00
<i>*Servicemen's edition</i> .....	1.00
At Ease: Brain Teasers (Leopold) .....	1.75
A Book of War Letters .....	2.00
Infantry Journal Reader .....	3.00
Patriotic Anthology (of American Writings) .....	3.00
Pocket Book of War Humor .....	.25
A Soldier's Reader .....	2.95
The Stag's Hornbook (Soldier Poetry) .....	2.00
Steinbeck Anthology .....	2.00
*Thesaurus of Humor (8,000 Jokes) .....	.25
A Treasury of Science (Shapley) .....	3.95

<b>Music</b>	
Crash On Artillery—Coast Artillery Song .....	1.00
Song of the Antiaircraft Artillery .....	.75
<i>Either, Band Arrangement</i> .....	.50
<i>Either, Piano Arrangement</i> .....	.50
Sound Off (Soldier Songs with Music) .....	3.50
That's the Infantry! (Godfrey & Harding) .....	.35
<i>Piano Arrangement</i> .....	.35
<i>Band Arrangement</i> .....	.75

<b>FIGHTING FORCES SERIES</b>	
Abraham Lincoln and the Fifth Column (Milton) .....	.25
America in Arms (Gen. Palmer) (History of U. S. Military Policy) .....	.25
The Army Life (Kahn) .....	.25
*The Battle is the Pay-Off (Major Ingersoll) .....	.25
Blitzkrieg: Armies on Wheels (Col. Marshall) .....	.25
*Conflict: The Civil War (Milton) .....	.25
*The Fight at Pearl Harbor (Clark) .....	.25

Fundamentals of Electricity (Mott-Smith)	25
*Gas Warfare (Waitt)	25
The German Soldier	25
Great Soldiers of the First World War	25
*The Gun (Forester)	25
Hitler's Second Army (Vagts)	25
*How to Abandon Ship (Richards & Banigan)	25
How to Shoot the U. S. Army Rifle	25
The Jap Soldier	25
*Japan's Military Masters (Lory)	25
*The Living Thoughts of Clausewitz	25
The Lost Battalion (Johnson & Pratt)	25
*Machine Warfare (Gen. Fuller)	25
Map Reading for the Soldier	1.00
Patriot Battles (Col. Azoy)	25
Psychology for the Fighting Man	25
Report on the Army (Gen. Marshall)	25
*Rifleman Dodd (Forester)	25
Scouting and Patrolling	25
Sergeant Terry Bull	25
Short History of the Army & Navy (Pratt)	25
Soldiers in the Philippines, 1898-1902	25
The Story of West Point 1802-1943 (Dupuy)	25
Studies on War	25
Tank-Fighter Team (Gerard)	25
*Thesaurus of Humor	25
The War in Outline 1939-43	25
Weapons for the Future (Johnson & Haven)	25
What to do Aboard the Transport	25

## INFANTRY JOURNAL—PENGUIN BOOKS

Americans vs. Germans, 1917-18	25
Aircraft Recognition (British, Nazi, Italian)	25
Genghis Khan (Lamb)	25
Guadalcanal Diary (Tregaskis)	25
Guerrilla Warfare (Levy)	25
Handbook for Army Wives & Mothers	25
History of the War in Maps, Pictographs & Words (Modley)	25
How the Jap Army Fights	25
Modern Battle (Thompson)	25
New Ways of War (Wintringham)	25
What's That Plane? (U. S. & Jap)	25

## PENGUIN BOOKS

### General

Christianity and Social Order (Temple)	25
Empire in the Changing World (Hancock)	25
The Good Soldier Schweik (Hasek)	25
Leaves of Grass (Walt Whitman)	25
The Moon is Down (John Steinbeck)	25
The Next Germany (By a Group of Anti-Nazi Germans)	25
Penguin Book of Sonnets, 1554-1943	25
Philosopher's Holiday (Edman)	25
The Physiology of Sex (Walker)	25
Russia (New Edition) (Pares)	25

### Mysteries and Adventure

All Concerned Notified (Reilly)	25
The Bell of Death (Gilbert)	25
Black Plumes (Allingham)	25
The Blind Barber (Carr)	25
A Blunt Instrument (Heyer)	25
The Case of the Late Pig (Allingham)	25
The Catalyst Club (Dyer)	25
Cause for Alarm (Ambley)	25
The Confidential Agent (Greene)	25
Conquest Takes All (Gray)	25
The Creaking Chair (Meynell)	25
The Cup of Gold (Steinbeck)	25
Dangerous Curves	25
The Dark Invader (von Rintelen)	25
Death at Dyke's Corner (Lorac)	25
Death Before Honor (Hume)	25
Death Leaves no Card (Burton)	25
Death Takes a Flat	25
Dorway to Danger (Maddock)	25
Drawn Conclusions (Schabelitz)	25
Everything is Thunder (Hardy)	25

The Flying Years (Niven)	25
High Rising (Thirkell)	25
In Hazard (Hughes)	25
Kitty Foyle (Christopher Morley)	25
The Last Adam (Cozzens)	25
The Middle Temple Murder (Fletcher)	25
Ministry of Fear (Greene)	25
Mr. Mortimer Gets the Jitters (Gray)	25
The Mother (Buck)	25
Murder By An Aristocrat (Eberhart)	25
My Own Murderer (Hall)	25
Mystery of the Smiling Doll (Holt)	25
The Ox-Bow Incident (Clark)	25
Pencil Points to Murder (Barber & Schabelitz)	25
Policeman's Holiday	25
Purple Sickle Murders (Crofts)	25
The Rasp (MacDonald)	25
Sabotage (Adams)	25
Shipyard Diary of a Woman Welder	25
Six Feet of Dynamite	25
Stealthy Terror (Ferguson)	25
The Stoat (Brook)	25
The Strange Case of Miss Annie Spragg (Bromfield)	25
Telephone Booth Indian (Humor)	25
Trent's Own Case (Bentley & Allen)	25
Two Survived (Jones)	25
Weeping is for Women (Chidsey)	25

## BINDERS

Field Manual Binder	1.50
Technical Manual Binder	1.50
(10% discount on binders only, in lots of 10 or more, f.o.b. Washington)	

## MODERN LIBRARY BOOKS

Alice in Wonderland; other Stories (Carroll)	95
Ancient Man (van Loon)	95
Anna Karenina (Tolstoy)	95
Anthology of American Negro Literature	95
Anthology of Light Verse	95
Arabian Nights (Burton)	95
Arrowsmith (Sinclair Lewis)	95
Autobiography of Benjamin Franklin	95
Autobiography of Benvenuto Cellini	95
Babbitt (Sinclair Lewis)	95
Batchelor Towers: The Warden (Trollope)	95
Barren Ground (Glasgow)	95
Best American Humorous Short Stories	95
Best Ghost Stories	95
Best Tales of Edgar Allan Poe	95
Best Russian Short Stories	95
Brothers Karamazov (Dostoevsky)	95
Casuals of the Sea (McFee)	95
The Cloister and the Hearth (Reade)	95
Collected Short Stories of Ring Lardner	95
Collected Stories of Dorothy Parker	95
Complete Writings of Thucydides	95
Complete Poetry & Selected Prose (Milton)	95
Comprehensive Anthology of American Verse	95
Consolation of Philosophy	95
Cyrano de Bergerac (Rostand)	95
Daring Young Man on the Flying Trapeze (Saroyan)	95
David Copperfield (Charles Dickens)	95
Decameron (Boccaccio)	95
Don Quixote (Cervantes)	95
Dracula (Stoker)	95
The Education of Henry Adams (Adams)	95
Eminent Victorians (Strachey)	95
Emperor Jones; Anna Christie; Hairy Ape (O'Neill)	95
Essays and Other Writings (Ralph Waldo Emerson)	95
Faust (Goethe)	95
Fathers and Sons (Turgenev)	95
The Federalist (Alexander Hamilton)	95
Fortitude (Hugh Walpole)	95
Fourteen Great Detective Stories	95
Gargantua & Pantagruel (Rabelais)	95
The Good Earth (Pearl Buck)	95
Great Modern Short Stories	95

Green Mansions (Hudson)	25
Growth of the Soil (Hamsun)	25
Gulliver's Travels; other Stories (Swift)	25
Henry Esmond (Thackeray)	25
Homer's Odyssey	25
Human Being (Christopher Morley)	25
Humphrey Clinker (Smollett)	25
Hunchback of Notre Dame (Victor Hugo)	25
I, Claudius (Robert Graves)	25
Joseph Andrews (Henry Fielding)	25
Late George Apley (Marquand)	25
Leaves of Grass (Walt Whitman)	25
Life of Michelangelo (John Symonds)	25
Madame Bovary (Flaubert)	25
The Medici (Young)	25
Mlle. de Maupin; One of Cleopatra's Nights (Gautier)	25
Moby Dick (Melville)	25
Moll Flanders (Defoe)	25
My War with the U. S. (Bemelmans)	25
Napoleon (Emil Ludwig)	25
Nana (Zola)	25
Of Human Bondage (Somerset Maugham)	25
Oracles of Nostradamus	25
Penguin Island (Anatole France)	25
Philosophy of William James	25
Pickwick Papers (Charles Dickens)	25
The Prince, and Discourses (Machiavelli)	25
The Red and the Black (Stendhal)	25
The Red Badge of Courage (Crane)	25
Return of the Native (Thomas Hardy)	25
Rome Haul (Walter Edmonds)	25
Sappho (Alphonse Daudet)	25
Scarlet Letter (Nathaniel Hawthorne)	25
The Sea and the Jungle (Tomlinson)	25
Shakespeare's Tragedies	25
Shakespeare's Comedies	25
Shakespeare's Histories & Poems	25
Short Bible (Goodspeed & Smith)	25
Sister Carrie (Theodore Dreiser)	25
Studies in Murder (Pearson)	25
Tess of the d'Urbervilles	25
The Three Musketeers (Dumas)	25
Tom Jones (Henry Fielding)	25
Tono Bungay (Wells)	25
Tortilla Flat (Steinbeck)	25
The Travels of Marco Polo	25
Turn of the Screw (Henry James)	25
Vanity Fair (William Thackeray)	25
Victory (Conrad)	25
Way of All Flesh (Samuel Butler)	25
Winesburg, Ohio (Sherwood Anderson)	25
Wisdom of Confucius	25
World War I in Outline (Hart)	25

## MODERN LIBRARY GIANTS

Complete Novels & Selected Tales (Nathaniel Hawthorne)	25
Complete Plays of Gilbert & Sullivan	25
Complete Poems of Keats & Shelley	25
Complete Works & Letters (Charles Lamb)	25
Complete Works of Homer	25
The Conquest of Mexico & Peru (Prescott)	25
English Philosophers from Bacon to Mill	25
Essays of Montaigne	25
Flowering of New England (Brooks)	25
The Forty Days of Musa Dash (Wexfel)	25
The French Revolution (Carlyle)	25
Guide to Great Orchestral Music (Spaeth)	25
History of Greece (Bury)	25
Les Miserables (Victor Hugo)	25
Life of Samuel Johnson (Boswell)	25
The Life and Writings of Abraham Lincoln	25
Metropolitan Opera Guide	25
Moonstone: Woman in White (Collins)	25
The Most Popular Novels of Sir Walter Scott	25
New Anthology of Modern Poetry	25
Poems and Plays of Tennyson	25
Sixteen Famous British Plays	25
Story of American Literature (Lewisohn)	25
Tristram Shandy (Sterne)	25
USA (Dos Passos)	25
Wandering Jew (Eugene Sue)	25
War & Peace (Tolstoy)	25

# It's Not Too Early for PERSONAL POSTWAR PLANNING

Even though the war is far from won, the man who begins his studies NOW will have a real advantage in the competition for Regular Army commissions or other employment. Civil life or Civil Service—the man who is prepared has the advantage.

## Mathematics

- MATHEMATICS FOR THE COAST ARTILLERY OFFICER.**  
Outlines the requirements in mathematics for Coast Artillery officer candidates; a short review. **25¢**
- POPULAR MATHEMATICS.** By Denning Miller.  
One of the fastest-selling mathematics books for self-study on the market today. **\$3.75**
- MATHEMATICS REFRESHER.** By A. Hooper.  
A streamlined text designed to teach young men of average intelligence enough arithmetic, algebra, geometry and trigonometry to fulfill the requirements for aviation air crews. **\$2.50**
- BASIC MATHEMATICS.** By William Betz.  
Written especially for the war program. Includes arithmetic, informal geometry, algebra, and numerical trigonometry. **\$1.48**
- COLLEGE ALGEBRA.** By Cooley, Graham, John and Tilley.  
The usual ground is covered, but in a particularly fresh and lucid manner that will hold the interest of the student. **\$2.25**
- A COURSE IN THE SLIDE RULE AND LOGARITHMS.**  
By E. Justin Hills.  
The different types of slide rules and their uses, with applications to trigonometry and other activities. With tables—well illustrated. **75¢**
- PLANE TRIGONOMETRY WITH TABLES.** By Kern, Kells, and Bland.  
A basic book for all orientation problems. **\$2.40**
- PLANE AND SPHERICAL TRIGONOMETRY.** By Kells, Kern, and Bland.  
Used at the Military and Naval Academies. Emphasizes the application of mathematical principles to military and naval problems. **\$2.75**
- SPHERICAL TRIGONOMETRY WITH NAVAL AND MILITARY APPLICATIONS.** By Kells, Kern, and Bland.  
One hundred and twelve colleges and universities adopted this text within four months after publication. **\$2.40**
- FIVE-PLACE LOGARITHMS AND TRIGONOMETRIC TABLES.** By Kells, Kern, and Bland.  
Includes five-place natural trigonometric functions. All tables include tabulation of proportional parts. **\$1.00**
- NEW METHODS IN EXTERIOR BALLISTICS.** By Forest R. Moulton.  
Considered the standard work on the subject. **\$4.00**

## Surveying

- SHORT COURSE IN SURVEYING.** By Davis and Kelly.  
A compact volume, almost pocket-size, convenient for the traveling Coast Artilleryman. Well-illustrated with diagrams and pictures; six-place logs of numbers and trigonometric functions; five-place logs of natural functions. **\$2.50**
- MILITARY AND NAVAL MAPS AND GRIDS.** By Flexner and Walker.  
The construction and use of maps, for the student with some, but not necessarily extensive, background in mathematics. **\$1.15**

## Electricity

- ELEMENTS OF ELECTRICITY.** By Timbie.  
This text is used at the Coast Artillery School at Fort Monroe. **\$3.00**
- FUNDAMENTALS OF ELECTRICITY.** By Lester L. Williard.  
Designed for use with wartime courses and for self-study. **\$1.24**
- COURSE IN ELECTRICAL ENGINEERING (Vol. I), DIRECT CURRENTS.** By C. L. Dawes.  
The 3rd edition; by a Harvard faculty member. **\$4.00**
- COURSE IN ELECTRICAL ENGINEERING (Vol. II), ALTERNATING CURRENTS.** By C. L. Dawes.  
Companion book; also 3rd edition. **\$4.00**

## Science

- INTRODUCTION TO METEOROLOGY.** By Sverre Peterson.  
Used at the Naval Academy; 236 pages. **\$2.50**
- A START IN METEOROLOGY.** By Armand N. Spitz.  
Easy to read; written in simple language. **\$1.50**
- FUNDAMENTALS OF MACHINES.** By Burton L. Cushing.  
How they operate; with military applications. **\$1.24**
- ELEMENTS OF PHYSICS.** By A. W. Smith.  
790 Pages; 4th edition; used at the Military Academy, West Point. **\$3.75**
- ELEMENTS OF ORDNANCE.** By Brigadier General Thomas J. Hayes.  
700 Pages; used at the Military Academy; a standard work on the subject. **\$6.50**
- CRYPTOGRAPHY.** By Lawrence Dwight Smith.  
An elementary but serious discussion of the science of secret writing. **\$2.50**

## Radio

- ELEMENTS OF RADIO.** By Abraham and William Marcus.  
A basic book; for study without an instructor. **\$4.00**
- FUNDAMENTALS OF RADIO.** By W. L. Everitt.  
For classroom use. **\$5.00**
- RADIO AMATEUR'S HANDBOOK. (Standard Edition.)**  
Electrical and radio fundamentals through design, construction, operation of amateur equipment. **\$1.00**
- RADIO AMATEUR'S HANDBOOK. (Defense Edition.)**  
For special use in radio training courses. Includes elementary mathematics necessary for solution of formulas and interpretation of graphs, log tables. **\$1.00**
- MODERN RADIO SERVICING.** By Alfred A. Ghirardi.  
1,276 pages of information, tips, and instruction for radio servicemen. Well presented, complete and well illustrated. **\$5.00**

## Seamanship

- PILOTING, SEAMANSHIP, AND SMALL BOAT HANDLING.** By Charles F. Chapman.  
Complete illustrated course in small boat work with many suggested questions and problems to be solved. By the editor of *Motor Boating*. Color and black and white illustrations. 315 pages; index. **\$2.50**

# Seacoast Artillery

*Basic Tactics and Technique*

Here is the long awaited basic volume on the tactics and technique of Seacoast Artillery--a volume complete enough to take the place of innumerable field and technical manuals and yet handy enough to carry with you.

The whole authoritative story is here, profusely illustrated and presented in logical, clear and easily understood language.



Complete,  
Illustrated,  
\$3.00

**COAST ARTILLERY JOURNAL**

631 Pennsylvania Ave., N. W.

Washington 4, D. C.