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# COAST ARTILLERY JOURNAL

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# AAA



German 20mm AA gun captured by the Russians



# *in* GROUND ROLES\*

To give the devil his due, the German was the first of the World War II contenders to realize, and then to utilize, the potentialities of antiaircraft artillery in rôles other than those having to do with the destruction of hostile aircraft.

As a matter of fact, the Germans had taken a long step in that direction back in the closing days of World War I, when they developed the Krupp eight-centimeter antiaircraft gun, the grand-daddy of the now famous German 88's. Motivated by that craving for high muzzle velocity, flat trajectory and low time of flight which characterizes all antiaircraft artillery ballisticians, the Germans brought their Krupp gun to a relatively high degree of performance even in those early days and soon thereafter began using the design as a basis for further developments in heavy caliber guns.

In the years immediately preceding the invasion of Poland, the Germans had developed the 8cm piece into an 8.8cm gun, more familiarly known to us as the 88mm, which they termed the Flak 18, or, for the literal-minded reader, the *Flugzeugabwehrkanone* (cannon for defense against aircraft), Model of 1918. The gun was characterized then, as the recent models still are, by good barrel length, comparatively low silhouette and excellent performance, chief feature of which was a high muzzle velocity. Tested and proved in the Spanish war, as was so much of the German equipment, the Flak 18 soon evolved into the Flak 36, basically the same piece but with improvements and a muzzle velocity of 2,750 foot seconds.

It was this Flak 36 model of the 88mm which first captured the imagination of war correspondents and military men alike when the Germans began using it in ground rôles. With their overwhelming air superiority in the assault on Poland, and later on in France and the Low Countries, the Germans found that the need for antiaircraft defense was negligible, whereupon they turned their ingenuity toward finding other uses for their AAA weapons, notably the 88mm. With considerable daring and enterprise, the antiaircraft artillery commanders soon found that the 88mm had certain capabilities unmatched by other

\*Prepared in the overseas Information Division, Antiaircraft Command.

weapons of German artillery, to wit: a terrific striking power, exceptional penetration with armor-piercing shot, extreme accuracy and flat trajectory. True, this last-named characteristic sometimes proved more of a hindrance than a help, but frequently a need for flat trajectory arose which could not be filled by other pieces of ordnance.

As the Wehrmacht continued to roll, military and press reports came to be studded with glowing accounts of the German 88mm in assaults against pillboxes, against strong points, against all types of prepared defenses, against hostile armor and mechanized targets, and as field artillery. Unfortunately, many observers lost sight of the fact that the fortunes of war at that stage of the game rather than any inherent miraculous abilities of the 88 were responsible for the success of these unorthodox tactics, and the 88 soon came to have a reputation as a "secret weapon" far out of proportion to the true state of affairs.

Meanwhile, the Germans had not neglected the development of their other principal antiaircraft weapon, the 20mm automatic cannon. There again, they could congratulate themselves on their foresight, for that weapon also had been brought along fairly well in the closing days of World War I. The German "Becker" gun, which gave much promise in the 20mm field, necessarily had to be abandoned (officially, at least) after the Versailles treaty supposedly put the Germans out of the armaments game. However, little time elapsed before that same design showed up in Switzerland, where its development was continued with loving care by the Oerlikon company, in which the Germans maintained more than a passing interest. Similarly, the Germans interested themselves in the organization which developed the "Solothurn" 20mm gun, accepted by many antiaircraft artillerymen as being the finest 20mm weapon in action today.

As with the 88mm, the Germans soon put their 20's to use in many rôles beside that of antiaircraft. Having developed a twin-bogied mount for the 88 which not only made for speed of emplacement but which permitted of limited firing from travel position, they went themselves one better with the 20mm and devised mountings for the gun on the standard German half-track equipment, thereby perfecting a highly-maneuverable, speedy and hard-hitting fire unit. The towed 20mm units were mounted on single-axle bogies which gave an almost phenomenal ease and speed of emplacement.

With such technical advantages at hand, the antiaircraft artillerymen began extensive use of the 20mm, and its big brother, the German 37mm, in assault rôles, not only against personnel but against such armor and prepared positions as were within the capabilities of the weapons. Here again, high muzzle velocity, flat trajectory and high rate of fire provided a specialized fire effect which stood the Jerries in good stead time and again during their campaigns in Europe and their subsequent campaigns in Africa.

The results attained with the Flak 18 and the Flak 36 in ground shoots, particularly against armor, influenced the development of the latest operational 88mm gun, known as the Flak 41. This comparatively new weapon departs somewhat from its predecessors in appearance, being more massive in style though actually no heavier in weight. Furthermore, it embodies several new characteristics which

render it more effective against both ground and air targets. For one thing, the muzzle velocity has been increased from the 2,750 foot-seconds of the Flak 36 to a figure in the neighborhood of 3,300 foot-seconds or better. This has been achieved by increasing barrel length by about three feet and by stepping up the propellant charge by approximately 100%, although with very small increase in projectile weight. The Flak 41 also has a lower silhouette in position and is equipped with a larger and better protective shield.

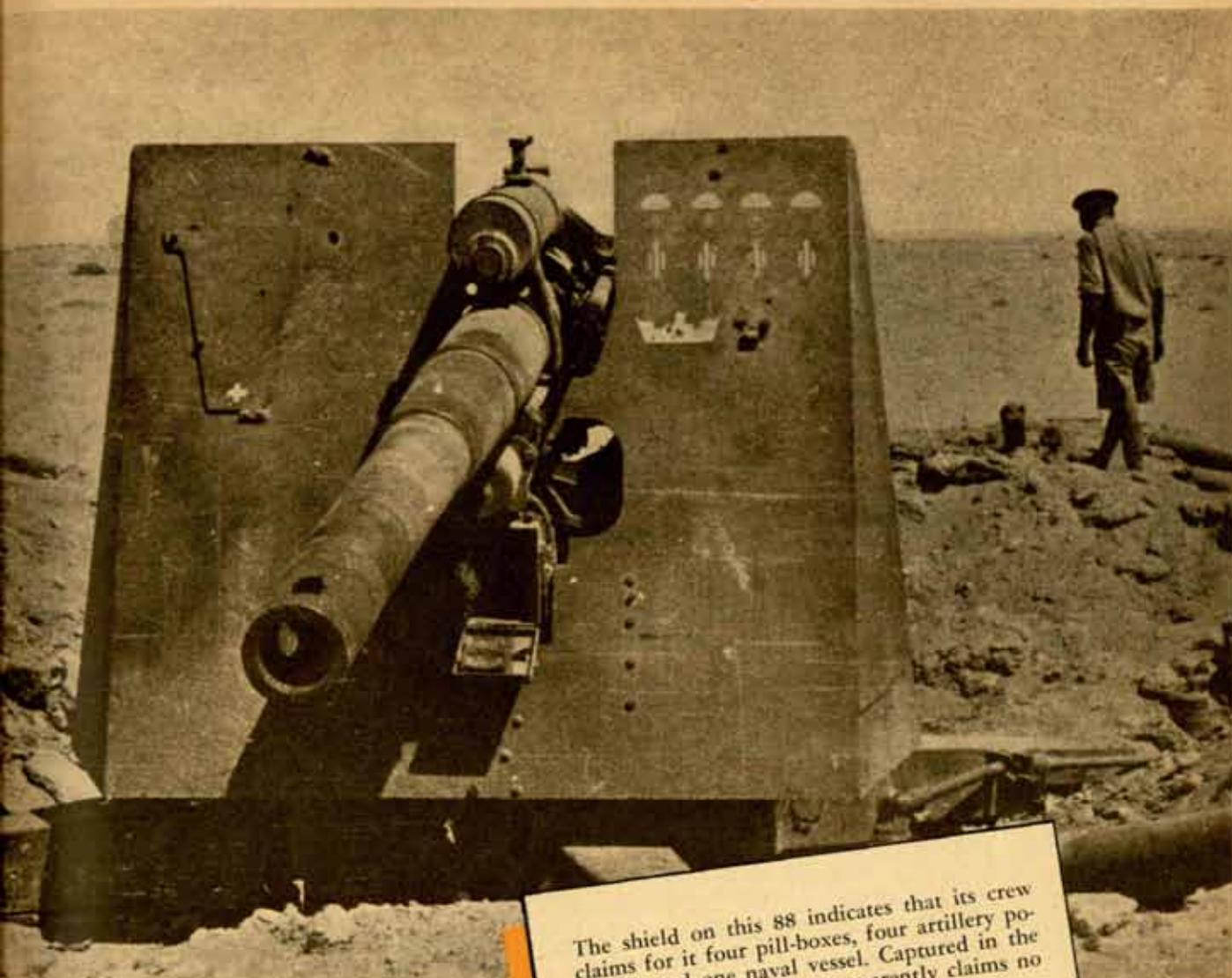
As might be expected, present trends in German antiaircraft development continue to show features designed to improve ground shooting as well as to enhance antiaircraft action, which now is their prime consideration. Bids fair to continue so.

On the other side of the world in the Pacific theater Japanese lagged considerably behind their Axis partners, not only in the technical development of antiaircraft artillery weapons but in the tactical employment of those weapons as well. True, the types of warfare have been decidedly different, and there has been, for example, little opportunity until lately for the use of Japanese AAA in antimechanized rôles against Allied armor. However, in neither design nor employment have the Jap heavy weapons been on a par with those of the Germans. For one thing, the construction and emplacement features of the Jap weapons do not permit the same efficiency of employment in ground action, although efforts toward such employment have been made with varying degrees of success. Probably the most effective use made of Jap AAA guns in other than antiaircraft artillery rôles thus far has been in connection with shore defenses. In many instances, the Japs have augmented standard shore batteries with AAA weapons varying in caliber from the 20mm up to their latest, biggest and best, the 127mm heavy gun, which generally is shore-mounted. Emplaced near the beach, the weapons have been used to protect against aircraft and also be available to lay down fire on landing craft and assault troops on the beaches.

The Japs have been somewhat more resourceful in their use of the 20mm cannon as a ground and air weapon. A glance at their standard Oerlikon-type mounts to perceive a strong field artillery influence. The mount has split trails, is easily and quickly emplaced and is capable of a high rate of fire, although its low muzzle velocity of 2,720 foot seconds as against the 2,950 of the German Solothurn guns.

Obviously, both the Germans and the Japs were able to get off to a flying start in their ground use of antiaircraft artillery weapons for they possessed, in the opening days of the war, the requisite air superiority. And, just as obviously, neither the British nor the Americans could do much in the way of experimentation, much less actual operations until the air picture changed a bit in favor of the Allies. For AAA resources early in the war were insufficient to handle even the demands for protection against air attack.

However, AA artillerymen training in the States here in 1941 began giving the matter their serious attention. Throughout the training centers antimechanized employment of the then-standard AAA weapons, the 3-inch and the 37mm, took its place in training programs. Since then, added impetus has been given such training.



The shield on this 88 indicates that its crew claims for it four pill-boxes, four artillery positions, and one naval vessel. Captured in the Western Desert, the gun apparently claims no aircraft destroyed.

It was not until the North African campaign was well under way that the Allies got any ground shooting under their belts, and there most of it was done by the British, who had learned the hard way from their experiences with Rommel's Afrika Korps. Several American automatic weapons units took up positions for ground shoots during the campaign but engaged in almost no activity in that rôle. The pitifully inadequate number of gun batteries on the Tunisian front made the task of anti-aircraft protection efficiently difficult without the additional job of ground shooting, though these units too were emplaced for such action occasionally. The British, however, using their 4.2-inch heavies for the most part, did some ground shooting in the closing days of the Tunisian campaign. The 88mm Bofors also got a little shooting at ground targets when the British used them for clearing out strong points, search steeples, observation posts and the like in those hectic days of early May, 1943, before the Germans folded completely.

The Allied anti-aircraft artillery began hitting its stride in

ground shoots during the invasion of Sicily, when several outfits fired effectively against hostile armor and other terrestrial targets. Even in Sicily, though, the scope of action was rather limited and it was not until the Italian show got moving that the anti-aircraft artillerymen really became dual- or multi-purpose gunners. One outstanding example of the successful use of anti-aircraft artillery as field artillery came during the assault on Mount Camino, near Cassino, when a 90mm gun battalion, working in close conjunction with the field artillery (which they were protecting against almost negligible German air attacks) laid down an effective concentration of timed fire at ranges in the neighborhood of 15,000 yards against German artillery. The results were most favorable, and throughout the theater AAA officers and men began delving deeper and deeper into the intricacies of field artillery firing, both as to tactics and technique. One outcome of these efforts was the publishing by Fifth Army headquarters of a Standing Operating Procedure pertaining to the ground employment of anti-aircraft artillery.

The principal ground use to which the antiaircraft artillery has been put in Italy has been as field artillery rather than as tank destroyers, as has been done elsewhere. Accordingly, the 90mm guns have been used both in direct fire and indirect fire. In the former rôle, the 90's produced results hardly obtainable with other weapons having lower muzzle velocities, less accuracy and more curving trajectories. Indirect fire, however, has been the more frequent rôle, with the 90's delivering counter-battery, harassing, interdiction and antipersonnel fire against hostile targets. This work has been conducted habitually in close coöperation with field artillery units. At first, it was necessary to get considerable assistance from the field artillery in setting up the AAA fire plan, registering the batteries, etc., but as the antiaircraft artillerymen became more experienced and more proficient, they began establishing survey parties within the AAA gun battalions and taking over a number of the fire control functions themselves. It is still normal, however, for control to be exercised through the field artillery fire direction centers.

Put to the uses mentioned above, the 90mm's have considerable flexibility in employment and a number of advantages not enjoyed fully by field artillery weapons. First of all, a range in excess of 15,000 yards is a consideration not to be overlooked. Secondly, a maximum rate of fire of 20 to 30 rounds per minute surpasses that of field artillery by far and permits the delivery of a terrific concentration of fire within a very brief time, thus pinning the enemy to ground and inflicting considerable casualties. A third advantage is the high muzzle velocity and flat trajectory, which not only make for accuracy but which put the projectile on the target without warning shell noise. Apropos of that, any G.I. who has had an 88mm shell dropped in his vicinity can vouch for the morale effect of the round which hits without warning. Still another advantage is the ability of the 90mm gun to traverse 360 degrees without delay and without displacement and to elevate almost to the vertical. As regards ammunition, the 90mm uses, in addition to the normal time-fuzed AA rounds, both point-detonating (for field artillery work) and armor piercing (for antimechanized work).

The principal disadvantages attending ground employment of the 90's include the comparative difficulty of emplacement and concealment, their relative tactical immobility during the fire fight and their flat trajectory. This last named feature, cited above as an advantage, nevertheless proves to be a disadvantage under many conditions, for at close ranges it frequently necessitates siting the 90mm on forward slopes and denies the use of defilade as enjoyed by field artillery weapons.

With the knowledge gained in the invasions of Sicily and Italy and during the Italian campaign, the antiaircraft artillerymen who participated in the invasion of Normandy were ready for considerable ground action when they hit the beaches, which was just as well, for they saw such action aplenty. Every type of AAA unit got its dose of ground employment, beginning with the caliber .50 machine gun batteries which hustled ashore early in the assault, continuing with the self-propelled 37mm's and .50's and including the 40's and 90's which reached the

beach later. Targets for the AAA (excluding aircraft) ran the gamut from rocket sites to pillboxes and anti-aircraft batteries. In addition to the artillery employment of the AAA, antiaircraft artillerymen themselves on more than one occasion were used as infantry, with occasional "mechanized" sallies in which the self-propelled AAA participated in ground actions as armored fighting vehicles.

The automatic weapons put up a good showing of their own in assault rôles, firing on buildings occupied by enemy troops, on concentration areas, on gun positions and on mechanized columns. They proved valuable also in engaging spot targets, which they handled speedily and effectively.

Operations in Western Europe subsequent to the invasion have seen the AAA in continued ground rôles (where the air situation has permitted), with new wrinkles in technique and tactics being added from time to time.

In the Pacific, American antiaircraft artillerymen have employed their weapons in many ways similar to the way in which they were used in the European theater, adapted, of course, to the peculiar conditions of terrain and enemy opposition in that theater. One weapon which has proved of exceptional value in its ground rôle in the Pacific is the quadruple caliber 40mm gun mount. That effective piece of equipment, capable of putting out lead at the rate of between 1,800 and 2,000 rounds per minute, has put a crimp into Japanese plans on more than one occasion. Its high rate of fire and the protection against small-arms fire afforded the crew by the shield has made it very useful in repelling ground attacks against AAA positions, which occur with greater frequency in the Pacific than in the European theater. The quad-mounted machine guns have not been alone in that rôle, however, for 40's and even 90's frequently have been employed in the perimeter defenses of beachheads.

Some time back, one 40mm battery performed yeoman



vice in clearing a ridge of Japanese defenses which had held up our infantry for quite a while. The ridge was covered with scrub growth which gave concealment to Japanese machine gun nests, and both were taking a heavy toll of the attacking infantrymen each time they assaulted the rise. Finally, in more of an experiment than anything else, the battery commander of the 40mm outfit moved his Bofors and his .50's as close to the front as possible. Then, at a designated time, he had his gunners open up at full automatic (120 rounds a minute) with the .50's and began sweeping the ridge with a hail of fire. Adjusted in swathes so as to gradually work up to the crest, the 40mm fire served as a giant lawnmower as the super-velocity fuzed projectiles cut down the scrub growth steadily and effectively. Meanwhile, the machine guns made short work of those exposed Japs and machine-gun nests which had not been knocked out by Bofors fire. On the heels of the AAA fire, the friendly infantry moved forward and took the position with ease.

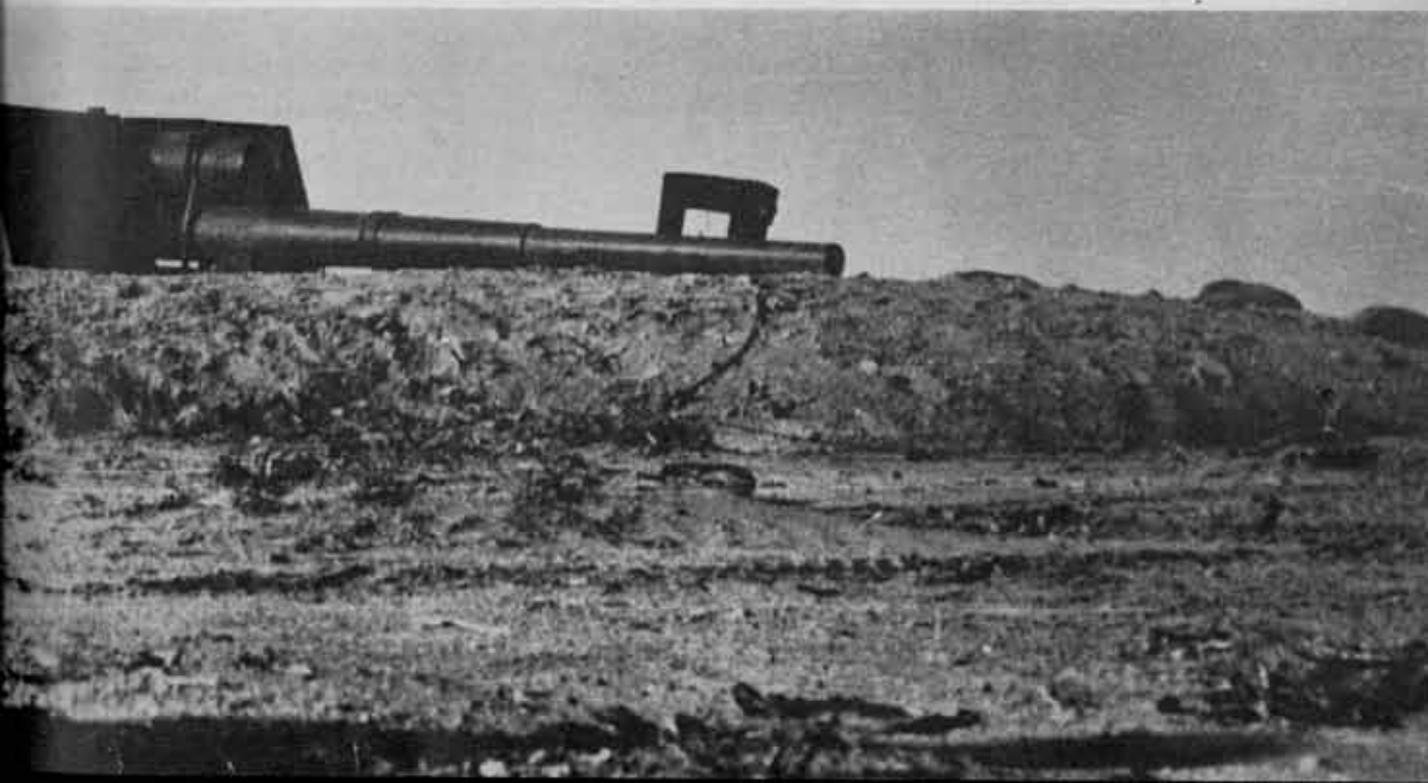
The Jap propensity for holing up in caves, dug-outs, etc., providing the antiaircraft artillerymen with additional targets as the island warfare moves on apace and bids fair to be a lucrative source of fruitful shooting in the future. The antiaircraft artillery searchlights, which in many instances have borne burdens of inaction or misuse, here have late have delved into the ground rôle and acquitted themselves well. In both the Pacific and in Europe, the 10,000,000-candlepower lights have been used to provide "artificial moonlight" for the illumination of ground objects at night. Not only has this employment of lights permitted the launching of better-coördinated and better-controlled

night attacks by infantry, but has (particularly in Italy) facilitated the construction work of engineers, the observed firing of field artillery and the movement of motor transport at night. When so used, the lights generally have been placed behind defilade rather close to the front and positioned so that their beams, when projected toward the enemy, provide illumination either by deflection from cloud base or by general diffusion of the low-angled shafts of light. Infrequently, the lights have been laid directly on the front lines, though this has the obvious disadvantage of making the lights much more vulnerable to hostile fire.

From time to time during the progress of the war, anti-aircraft weapons have been used in ground rôles other than those mentioned thus far, such as the marking of control lines with 40mm tracers for attacks by infantry at night, an innovation introduced by the British back at El Alamein and used since then intermittently by both British and American troops. Also, 40mm tracers have been used to "point" to other battlefield features at night from time to time. Rapid fire with the 40's has been found rather effective in clearing lanes through barbed wire. And, in a field somewhat apart from those already discussed, automatic weapons, guns and searchlights all have been employed in the defenses against naval attack, with particular reference to PT boats and submarines. In the Mediterranean, these weapons opposed the added threat of limpet mines and human torpedoes.

The numerous ground rôles discussed above do not mirror the full capabilities of antiaircraft artillery weapons, but they do serve somewhat to emphasize the versatility of the AAA. The present finds the AAA on the offensive, no longer waiting for the enemy but seeking him out. Time alone will disclose what the future holds, but it will find in the triple-A a triple-threat in the form of artillery prepared to engage targets afloat, ashore or aloft.

Note the low silhouette of this German 88mm gun (Flak 36). The installation is typical of emplacements for ground rôles in the African campaigns.



# SMOKE IN DEFENSE

By Colonel M. E. Barker, Chemical Warfare Service

## INTRODUCTION

The very existence of the Anzio beachhead depended upon landing an average of 2,000 tons of supplies every day through a small port and over two supply beaches, all of which were under direct observation and within effective range of German 170mm and 280mm artillery. In addition, the Asturas landing beach was within range of German 88's and at night self-propelled weapons frequently moved in close enough to the central front lines to shell the port of Anzio and the main supply beach at Nettuno. In addition, there was an average of some three air raids by twenty-five planes each day. At least two of these raids were directed against the supply beaches, the port, and the road net between these beaches and the supply dumps. This condition lasted four months from the 28th of January, 1944, at the time our beachhead perimeter was driven in by furious German attacks, until the last of May when the beachhead forces broke through the surrounding German defenses.

In this bad situation the Fifth Army met and so many problems for which there were no textbook answers. These problems had to be solved in order that the beachhead forces could even exist, let alone prepare for a counter-offensive. One of these many problems had to do with the large-scale use of smoke, which is the subject of this report.

## TOPOGRAPHY OF THE ANZIO BEACHHEAD AREA

In order to understand the situation some knowledge of the terrain is important. In time of peace Anzio was a small, thriving port serving the productive farmland of the Littoria Marsh area. Anzio port had a rated capacity of 450 tons per day when operated on a twenty-four-hour basis. Two small coastal steamers could be handled at a time for unloading on the dock area. The port of Anzio is approximately sixteen miles south of the mouth of the Tiber River area, called the Lido di Roma, and is about twenty miles north of Mount Circeo, which hemmed in the southern extremity of the Littoria Marsh area. Sw



Digging in an Esso mechanical generator. Smoke haze shown is density necessary to prevent lateral daylight observation. AA screen must be many times as dense.

# OF A VITAL PORT



The waterfront of Nettuno, with Anzio harbor at extreme left. Ancient Papal palace right foreground.

in a generally northerly and westerly direction from the point of the Circeo, there are rather steep mountainous areas in a fan-like semicircle about the Anzio area. There were tall church steeples at Littoria and Bargo Piave which afforded uninterrupted observation over the entire Anzio beachhead area, including all of the landing beaches and the port. The distance from Bargo Piave to Anzio is some ten miles and to the landing beach just north of Torre Astura it is only eight miles. Northeast of Anzio, across a gently, gradually ascending plain was the road and railroad center of Cisterna with high mountains in the background. A main highway and railroad lead directly from Anzio to Rome through the Albion Hills area, known in Italy as the Colli Laziali hill mass. The Anzio beachhead might be likened to a palm leaf fan with Anzio as the stem and with high ground around the entire periphery of the fan.

## MILITARY FEATURES OF THE BEACHHEAD

The beachhead had a maximum depth on the left flank of about nine miles, a distance of seven miles from Anzio to the front lines in the center, and a distance of about ten miles on the right flank. (See Sketch 1 for outlines of the beachhead during April and May, 1944.) The principal products of the area were sheep, vineyards, and vegetables, with some dairying on the east flank along the Musseloni Canal. The better houses in the area were brick and stone, some of them having extremely thick walls and dating back to the Middle Ages, but the majority of the farmhouses were flimsy one- and two-story wooden structures with a few small out-buildings. The secondary roads were gravel, with a single concrete road running north from Anzio. The gravel roads rapidly deteriorated under heavy traffic and required constant upkeep and reinforcement, but the only supply of rock for road building came in limited amounts found in storage and the wreckage of houses destroyed by bombs and artillery fire.

## SUPPLY

The port of Anzio was usable in practically all weather, except for about two days a month when the water was too rough. Between Anzio and Nettuno lay the main supply and personnel landing beach which was usable about two-thirds of the time, and on a long, sandy beach halfway between Nettuno and Torre Astura there was a flat, sandy area usable for landing ammunition, gasoline, and food supplies by LCT's and DUWKS unloading Liberty ships in the roadstead. This was usable not quite half of the time on account of the weather. Supply dumps were located in the middle of the beachhead area. (See Sketch Map No. 1.)

Personnel, mail, and perishable supplies when available were brought up from Naples by LCI's and unloaded in Anzio harbor. The urgently needed supplies came in on trucks carried by LST's which unloaded in Anzio harbor. Liberty ships unloaded the bulk of supplies directly into DUWKS which delivered the supplies directly to the supply dumps or into LCT's which were unloaded on the beaches. The major Class II installations were in caves, buildings, and open storage generally in the north edge of Nettuno and in the area about four miles northwest of Anzio between the beach road and the railway, where considerable defilade and numbers of factory buildings were available for storage. Class III supplies were stored in the area just north of Asturas beach and in the area on both sides of the Anzio-Rome highway and on the north beach highway at a distance approximately halfway between the port and the front lines. The major Class V installations were located in the center of the beachhead area in rolling, sandy terrain, mostly vineyards, generally centered around and to the west of Camp Carreto area. Division and battalion dumps for all supplies were located directly in the rear of their respective front-line areas. Gasoline and Class V supplies were stacked in relatively small piles and enclosed



der the operational control of the AA brigade commander. The American smoke company was armed with Besler and Esso type mechanical smoke generators and provided with ample supplies of M1 smoke pots. The British company was set up to operate with smoke pots only, using British Mark 24 smoke generators. The initial disposition of the smoke units for AA defense is shown in sketch Map No. 2.

#### TECHNIQUE OF SMOKE GENERATION

The command to "make smoke" was transmitted to the smoke generator battalion command post by the anti-aircraft commander and generally there was a five-minute interval before the first bombs arrived in the area. The British smoke generator unit operated some sixty smoke emission points very close to the water's edge. Frequently these smoke points were dug into cut banks with pipes leading to the inside through which the smoke could pass without the fire from the burning smoke pots being visible from the sea. In other cases, hovels were made of pottery or sheet iron to accomplish the same purpose. The smoke pot line was divided into segments, each under the control of a commissioned officer, and two privates were assigned to work as a pair to keep two adjacent smoke pot emission points in operation. Upon the order to "make smoke," each smoke pot installation immediately got into action and in a relatively short period of time the entire beach line and Anzio harbor proper were obliterated from air view by a smoke blanket. At the same time the American smoke generator company, operating mechanical smoke generators, went into action farther inland. Their smoke generator blanket soon merged with the smoke pot blanket to produce a continuous sheet of dense smoke over the Anzio harbor proper and the Nettuno landing beach. This blanket had to be dense enough to resist penetration from strings of glow flares dropped by the air raiders.

#### METEOROLOGICAL CONDITIONS

Experience showed that 95% of the time the wind shifted to the north about one hour before sundown and



Map No. 2.



A Besler generator, part of the AA screen at Anzio.

usually died down to less than 5 m.p.h. about sundown for a period of two to three hours. The wind continued to blow from the north until about an hour after sunrise. Furthermore, experience generally indicated that at least one air raid came in the early evening soon after sundown. In spite of the fact that smoke was a considerable hazard to the movement of vessels in the harbor, it was found to be much less a hazard than German aircraft bombing. Hence it became SOP to start the mechanical smoke generators at about one hour before sundown and to lay a haze up and down the beach and over the port area which was of very great assistance in preventing enemy aircraft from picking out individual vessels in the roadstead.

#### EFFECT OF SMOKE OF 90MM GUNFIRE

Due to the fact that the north wind carried most of the smoke to sea, the smoke proved to be no special disadvantage to the 90mm anti-aircraft. As a matter of fact, a very dense smoke covered the flashes of the anti-aircraft guns and prevented their location by enemy aircraft. Anti-aircraft personnel initially had been violently opposed to smoke, but after some experience they welcomed its protecting blanket. The Germans, on the other hand, seeing that we made smoke every time an attack was launched, sent in many nuisance raiders and this caused our smoke consumption to shoot skyward at such a rate that the total amount of smoke being used exceeded the tonnage of ammunition being expended, which was intolerable. The technique was developed then of ordering smoke *only when five or more enemy aircraft entered the area at night*. No anti-aircraft screens were used in daylight since we could rely on the AA defenses and defense aircraft to keep the bulk of enemy aircraft away from the target area. This finally became SOP and was generally satisfactory to all concerned.

#### REINFORCEMENT OF THE SMOKE SCREEN

The forces on the beachhead continued to increase in



Bombed and shelled buildings provided road-building material.

number and this necessitated more supplies being landed. Therefore it became necessary to increase the smoke barrage to provide better protection for the Nettuno landing beach. Consequently, a smoke generator company, armed with twenty-four M1 mechanical smoke generators (Esso), was brought in and established in back of the Nettuno beach area and sited so as to cover the town of Nettuno as well. The new distribution of smoke generators is shown in Sketch Map No. 2. No change in operating procedure was found necessary.

FURTHER TACTICAL DEVELOPMENTS

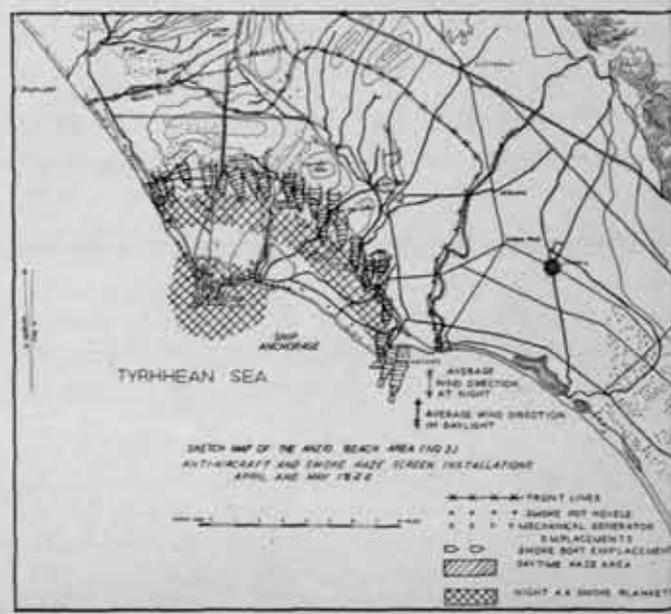
German air attacks proved to be so ineffective against Anzio and the Nettuno landing beach when under smoke that their efforts were shifted to front-line installations and to the dump areas in the center of the beachhead. They especially concentrated on the area directly north of Nettuno, using long-range artillery in conjunction with the air raids at night. The flarelight used was so intense that the area could be seen even at night by the artillery observers miles away. Also at this time, which was about the 1st of April, 1944, many additional long-range 170's and 280's were brought up and put in operation against the beachhead, the principal targets being Corps Headquarters in Nettuno; Army Headquarters at the Villa Borgese; the port of Anzio, the Anzio supply beaches and against the ships in the harbor. Aircraft raids in daytime had proved so costly that air attacks were shifted to the night only except in rare cases, and long-range artillery was used several

times each day against the supply and command installations. The effect of this long-range artillery became great that something had to be done about it and in spite of many known objections to the large-scale use of smoke the Army commander, Lieutenant General Mark Clark directed that German observation into the entire Nettuno-Anzio area be eliminated by smoke.

Through the cooperation of the anti-aircraft commander, the army artillery commander, army G-4, and the beach commander, a decision was reached as to the general plan which would be made available to set up the screen in a semicircle between the port of Anzio and high ground from the northwest to the east. On a clear day excellent observation from the southeast up the coast could be obtained from Mount Circeo; consequently, it was necessary to extend the smoke screen to sea. The problem was to set up and maintain a smoke haze during all hours of daylight and during air raids at night which would prevent observation into the supply area without interrupting activities in the area. Accordingly, the area agreed upon was studied from the air by the Army Chemical Officer and approximately 100 smoke pot emission points were set up for a test. Supplies of smoke pots were stored in holes and the individuals to operate the screens were placed in foxholes with overhead cover provided where possible. All smoke pot installations were placed in such defilade as was available. At daylight smoke was generated around the fan-shaped perimeter and observed from the air by the Army Chemical Officer, who dropped messages as required to any area to increase or decrease the amount of smoke which they were making.

DEVELOPMENT OF TECHNIQUE

Air currents were studied and plotted from the air by observing the movement of smoke clouds and the results following the first day of smoke, many of the smoke emission points were shifted so as to take better advantage of ground features and the movement of smoke clouds. During the first two days there was violent objection to the smoke by every unit in whose area the smoke was generated.



Map No. 3

ed, but during these two days the effect of enemy artillery fire fell off to a marked extent in spite of a greatly increased number of rounds fired into the smoked area. Based upon all of the kicks by unit commanders, as well as a study of unloading rates prepared by G-4, it was decided to install a permanent ring of mechanical smoke generators (supplemented by smoke pots) along the general line developed by the two-day experiment with smoke pots. This necessitated continuous work by the smoke generator company, assisted by a company of Engineers and a Signal detachment for two nights and one day in order to prepare emplacements for the smoke generators, to move out supplies of fog oil and smoke pots, to prepare dugouts for the operating personnel, and to lay telephone lines connecting an observation post from the top of the highest building in Nettuno with each generator emplacement. At the end of this time the ring of mechanical generators was complete and was put into operation. In the meantime the Navy had furnished two small craft for the Asturas area and one for the northern area, each craft mounting two Besler mechanical smoke generators. When the wind was from the south, it was necessary to generate smoke at sea on both banks. When the wind was from the west, only the left bank needed smoke from the sea, but most days the wind was from the southeast which necessitated smoke from the two ships off Torre Astura. (See sketch map No. 3 for disposition of generators.)

#### DETAILED CONTROL

No attempt was made to lay down a dense smoke, but rather to generate a haze which would prevent the observer on top of the building at Nettuno seeing through the haze well enough to pick up the details of the Littoria towers and the hill masses generally to the north of Cisterna. Thus it became necessary to operate the mechanical smoke generators at widely varying rates of fog oil consumption in order to accomplish this result with the minimum consumption of fuel. An inventive sergeant in the maintenance company soon developed a by-pass arrangement which enabled the mechanical smoke generator operator to vary the smoke consumption from thirty-five gallons per hour to 120 gallons per hour. In addition, three smoke pot emission points in hovels were laid out in the vicinity of each mechanical smoke generator position so that when necessary the smoke from the mechanical generators could be supplemented or replaced by HC smoke from the smoke pots. Also, in the rare cases when a north wind blew in the daytime, the smoke pot installations were operated to help conceal the exact location of the mechanical smoke generators and thus reduce the effect of German artillery fire which was directed frequently against individual mechanical generators.

#### CONSUMPTION OF SMOKE GENERATORS

On an average day the anti-aircraft smoke screen consumed 500 gallons of fog oil for the sundown haze and approximately 2,500 gallons of fog oil and 1,000 smoke pots for each hour that an air raid continued. The maximum consumption of smoke materials for the anti-aircraft screen was approximately 10,000 gallons of fog oil and 5,000 smoke pots for one night. On an average day the

smoke haze to prevent observed artillery fire consumed approximately 10,000 gallons of fog oil and only a few hundred smoke pots; however, on two or three days when there was a high wind and a bright sun as many as 40,000 gallons of fog oil and 5,000 smoke pots were consumed.

#### LIVING IN SMOKE

After the various units became accustomed to the use of smoke in the area, they simply moved their installations so as to take advantage of the smoke screen and to get some little distance away from the individual generators. From time to time complaints were submitted on the effect of the screen and in some cases a movement of the generator solved the problem, but in other cases the unit concerned was required to move its installation. The smoke screen required constant observation from the smoke control tower at Nettuno which had to be occupied day and night. Linesmen had to be on the job twenty-four hours a day to keep the telephone lines radiating out from the control tower in working order. Radio was used only in case of necessity when the telephone lines were out. The corner of the tower was knocked off one day by a 170 shell and several days later other 170's went through the building below the tower, but the observers stayed on the job.

#### MAINTENANCE

The maintenance of mechanical smoke generators proved to be a problem of considerable magnitude. On the average at least two generators per day were put out of operation temporarily by enemy artillery fire or air bombing. Major assemblies for both the Besler and the Esso generators were kept on hand at the maintenance shop and a telephone call from the operator to the control tower would be relayed to the maintenance shop, resulted in just the right part or parts being sent out to the generator. The mechanics went along day or night with the parts, made the necessary repairs, and put the generator back in operation. When such repairs were under way, the smoke pot generating emplacements were all kept in operation to provide the required smoke screen. Occasionally, a generator would be smashed so badly that it had to be replaced with a complete unit. In that case a supply truck with an "A" frame went out at night, unloaded the new generator, put the wrecked generator on the truck, and then installed the new generator in position, after which the wrecked machine was brought into the maintenance shop. In many cases two or three wrecked machines could be cannibalized and with a few spare parts an operating machine could be put into use. From time to time salvaged parts and wrecked machines were sent back to Naples where more extensive repairs could be effected. Over a period of time it was found that about four new generators per week were required to keep fifty-four generators in operation under fire.

Early in the operation it became evident that the water available, which was rather hard, would soon clog the heating coils and make all the machines inoperable. Heating coils were found to be plugged with scale so that the hole in the center had been reduced from approximately one inch in diameter to the size of the lead in a pencil. The scale was so hard that it could not be loosened up and washed out with acid, with alkali, or with any other means



## First Aid to the Infantry

By Lieutenant Colonel John C. Mazzei, Coast Artillery Corps

The question as to whether the antiaircraft automatic weapons can be effectively used in other than an AA rôle has been answered in the affirmative, at least to the satisfaction of the men of this Battalion and the Division to which it is attached. The fact that the 40mm Bofors or the M-51 quadruple mounted machine guns are specialized weapons, designed for a specific purpose, should not confine their use merely to the engagement of aerial targets. It has been proved that they can be devastatingly effective in carefully thought-out ground rôles and their value in front-line combat is conclusively confirmed. This Battalion, attached to an Infantry Division, has been requested at various times to deviate from its normal function, and take part in some particular operation with the Division in a ground rôle, either to deliver preliminary or supporting fire upon the enemy. One particular case, the first, incidentally, in which the guns of this Battalion were so used, proved to be particularly interesting from a tactical viewpoint.

The Division, after crossing the Moselle River, was confronted by difficult terrain, consisting of wooded hilltops studded with well organized and prepared hostile positions. These were strongly and tenaciously held by the enemy against unsuccessful attacks during a three-week period. On this occasion, it was planned to attack the objectives with two regiments of infantry, the main efforts coming from the flanks, and to proceed the assault with a heavy concentration of smoke, artillery and mortar fire. At this stage of the planning, the AAA Battalion Commander was called by the Division and consulted as to the advisability and feasibility of employing the M-51 mounts of this Battalion to support the attack. It was felt that the concentration of .50 caliber machine-gun fire of these mounts would pin down the enemy and augment the artillery support.

From the map, the terrain looked ideal for an operation of this sort. The Battalion Commander, after careful thought and discussion with the G-3, felt that the mission

could be accomplished without seriously endangering either the personnel or the matériel of the organization. With some fear and trepidation, the AA Commander agreed to commit sixteen M-51 mounts (eight each of Batteries A and D) to support the attack, which he felt could be done without jeopardizing the primary mission of the Battalion. These plans were made several days before the attack was to take place.

The Battalion Commander, accompanied by both the Executive and S-3, made a detailed ground reconnaissance of the area to be occupied, and found that the conclusions made from the map were justified. Areas were selected for both batteries, A in some scrub pine at the Northern end, and D in the woods at the Southern end, both being on forward slopes, and concealed from enemy observation. The approaches were through the woods, which fortunately had a road system favorable to the project. After having been assigned their areas, the Battery Commanders of both A and D completed the reconnaissance in detail, selected individual gun positions. All this while, the contemplated positions were subjected to intermittent artillery fire by the enemy. The objectives were approximately 3,500 yards from the sites selected.

A platoon of Engineers was attached to the Battalion for the operation, to assist both batteries in preparing the positions. Each mount was well dug in and sandbagged, and individual foxholes constructed for the shelter of the crews. Since all the weapons were sited in heavily wooded areas, movement to positions was made in daylight hours, well-concealed from enemy observation. The M-51's were towed into place by their prime movers, and after being emplaced, the vehicles were moved to concealed and protected assembly areas in the rear. Once the guns were emplaced, all movement in the area ceased. During the night preceding D day, final work was done on the positions and the fields of fire cleared of any obstructing trees.

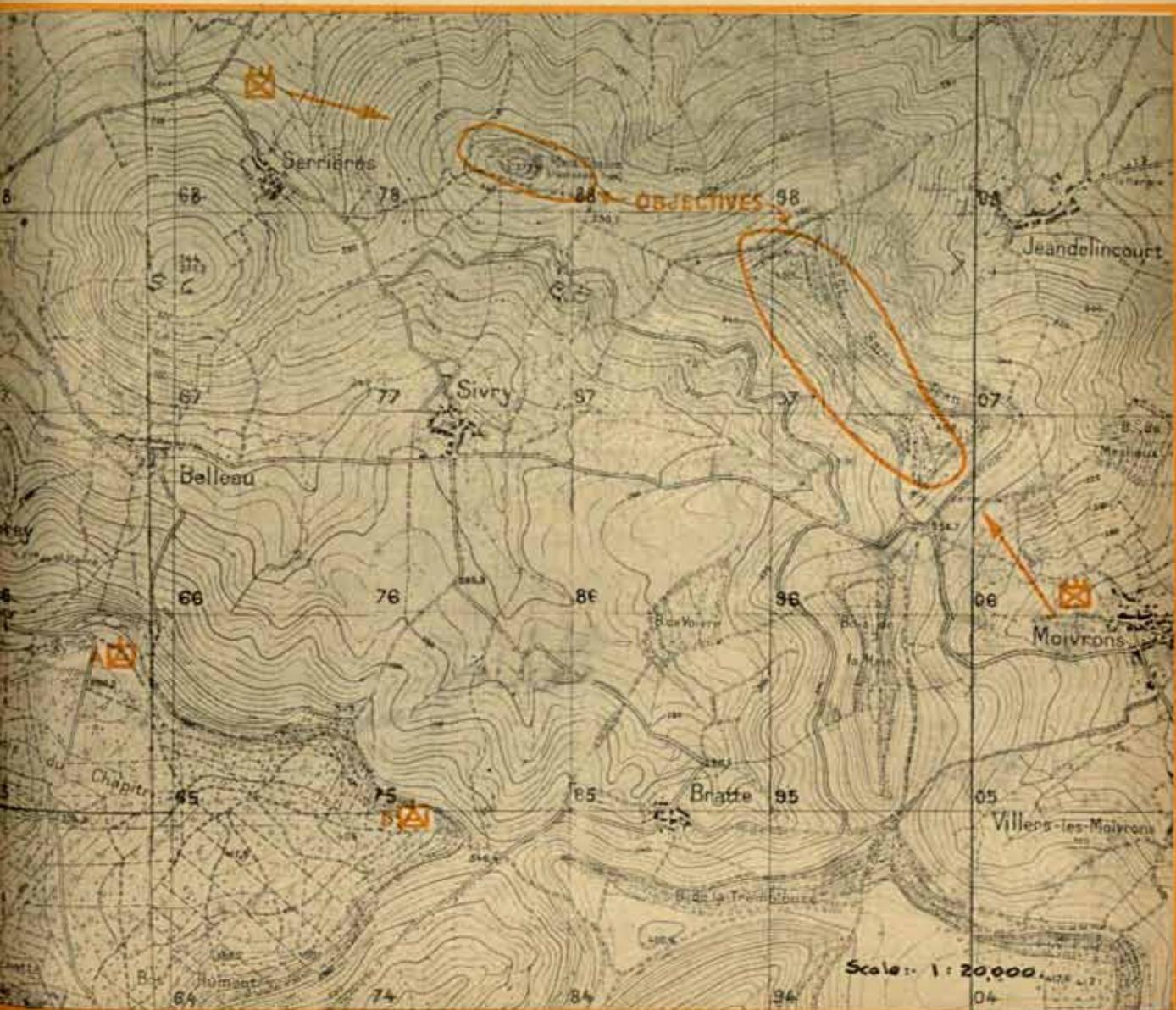
# NG FRONTS

anches. Despite the fact that the forward edge of the  
ods occupied was under constant observation, so well  
s the activity of the troops concealed that no enemy  
was drawn during this period.

Fire Control was accomplished through coordination  
with the Field Artillery FDC, which was equipped to re-  
ve calls from the leading elements of the Infantry to  
the fire if necessary. The Battalion Executive was  
designated as AA Fire Control Officer, and set up with  
OP of one of the Field Artillery Battalions adjacent to  
M-51 positions. From here, one line was laid to each  
of the Battery OP's, which in turn had wire laid to each  
n. Since the target areas were beyond the tracer burn-

out range of the machine guns, the guns were laid in eleva-  
tion by gunners' quadrants using firing table data. In azi-  
muth they were laid directly, the gunners firing bursts  
from one edge of the target to the other. It is interesting  
to note that after the initial bursts, the gunners were able  
to observe their fire as incendiary bullets could be seen  
bursting on impact.

The coordinated barrage commenced at 0600 hours and  
lasted until 0630 hours. Heavy smoke concentrations were  
laid on the enemy positions, and artillery, mortars, and  
M-51's were fired. Short bursts were fired continuously  
at the designated objective, augmenting the fire of the  
artillery and pinning the enemy to their holes. Shortly



after fire commenced, an enemy machine gun, located in Sivry, a town approximately 1,500 yards in front of the positions, opened fire on Battery A. The Battalion Fire Control Officer, quick to perceive this, ordered Battery D to place its fire on the town. The hostile fire ceased, and the Battery Commander of D reported that the enemy machine guns had ceased fire due to a stoppage . . . of manpower. Other than this, no counterbattery was received, and fire was delivered as planned until 0630. After that time, orders were to fire at targets of opportunity, but none presented themselves. When it was ascertained that the objectives had been taken, all guns were thoroughly cleaned, and the prime movers were brought up to remove the mounts to an assembly area to await further orders for the resumption of their normal and primary missions.

The Infantry attacks were a complete success. Very slight casualties were suffered, and the first objectives were taken in fifty-seven minutes. Many enemy dead and wounded were found in the target area, and 575 prisoners, including ten officers, were captured. The Division G-2 and G-3 and one of the Infantry Regimental Commanders, when interviewed, commented on the important part the M-51 fire had played in the success of these attacks. The Infantry Commander, in particular, was enthusiastic, and pointed out the great morale effect the tremendous amount of .50 caliber tracer had on his troops, and that the Infantry's task was greatly eased because the enemy were so completely pinned down and disrupted by the barrage.

Considering the results, the cost was practically negligible. About 80,000 rounds of .50 caliber ammunition were fired, resulting in the burning out of eleven barrels. No other damage to either personnel or matériel occurred. Due to the constant firing, barrels, though changed at constant intervals, became very hot. In practically all cases by the time the rotation of the three barrels was completed, the first was still very hot. In addition, the constant jarring of the gun and mount, due to the prolonged firing, may cause a failure in the traversing mechanism. Both these difficulties can be overcome by a reduction in the rate of firing the short bursts.

After this first and overwhelmingly successful employment of the M-51's in a ground rôle, the battalion was called for similar support on two more occasions. Neither, however, were on such a large scale, and while their results were excellent, could not compare with those mentioned above.

The lessons learned from the first incident were applied and the engagements conducted with no loss of personnel or matériel, even burned-out barrels. The second engagement was originally planned for eight mounts of Battery D, but due to mud and the low maneuverability of the M-51 mount preventing the emplacement of one platoon only four were used. This completely neutralized several 88mm, mortar and machine-gun positions, again with hostile fire drawn and no casualties. The third, in which one complete platoon, both 40mm and M-51's of Battery were employed, assisted the Infantry in capturing a strongly held town. In this case, enemy mortar fire was drawn but the engagement was successful and the weapons were able to withdraw without damage.

It was originally decided to withdraw the tracer rounds from the belts before firing in the two latter cases, so that the source of fire could not be located by the enemy. The Infantry, however, pleaded to leave the tracers in, so that the mere sight of the tracer streams overhead, directed toward the enemy, is a great morale factor to them. Unchecked machine-gun fire causes the men to stop, and hinders their advance until the source is located. The Battalion quiesced and considered it a small favor on our part, for so long as our associations with the Doughboy continue, more is our appreciation of their problems and their great contribution toward ultimate victory.

While there may be some who comment adversely on the tactical wisdom of the use of AAA weapons in a ground rôle, there is no doubt in the success of the engagements cited here. The probability of casualties, both in men and equipment, are well offset by the results obtained, in prisoners captured and in losses inflicted on enemy ground troops and matériel. And, too, in these days of diminishing hostile aerial activity, it proves that the antiaircraft is versatile, and can earn its salt.

Several important lessons are illustrated by this commitment, which it is desirable to point out:

1. The importance of commanders realizing the capabilities and limitations of AAA weapons and consulting their AAA Commanders before committing them to ground rôles.
2. The importance of a thorough and careful reconnaissance, selection and occupation of positions.
3. The value of occupying the positions at night and by concealed routes, if possible, to avoid observation.

# The Morale Situation

—Of An Overseas AW Battery

By Lieutenant Martin E. Koskela, Coast Artillery Corps

Morale has been the subject of innumerable directives, articles and pamphlets, and remains, particularly overseas, a constant and important problem. Few if any definitions of the term agree yet we are all aware that such a thing, or state of mind, exists for better or for worse.

The Automatic Weapons battery in particular encounters the vexatious question because of its tactical setting scattering eight sections over a considerable area. The searchlight battery is in a similar predicament. And the problem grows as the battery nears the enemy.

A 90mm gun battery is a comparatively compact group, personnel together and available for entertainment and lectures. In an active area the AW battery, however, follows an SOP that demands a certain minimum number of personnel at the gun at all times. Very few can go to the headquarters area at once. So the program of orientation, information and education, or recreation and entertainment, is severely complicated.

A section wearies of games among its own members, indefinitely. The spirit of competition wanes and dies; rivalry is needed between sections, and batteries if possible. The battery personnel cannot be reached by a single officer at headquarters, so the Information and Education, Morale, or Special Services officer is hard-pressed to deliver identical talks at eight separate sections. Even motion pictures, one of the best entertainments available in the field, become a problem of presentation.

The touring USO shows present a peculiar predicament for AW batteries. Frequently they backfire detrimentally on the men, living alone for long periods at an AW section, and are hardly buoyed by the knowledge that the Air Corps Engineers, a mile or so away, are being entertained by Bob Hope or Betty Hutton or Carole Landis. The men know they cannot go to the show, and discontent rather than entertainment is born from the visits of the stars. Usually an AW section is too small to merit an individual showing by the USO troupe.

The officers concerned must face the ever-present and ever-real difficulties and attempt a solution. Too often, the situation is abandoned as hopeless, with the result that morale sags and griping mounts, and the I.G.'s inspectors record that the men appear "sullen and surly."

Most other arms and services regard the AW battery as highly mobile, whether it is or not. They believe a movement of a section requires only the towing of a gun and re-erecting of a couple of tents. Therefore, after an AW position is laboriously built by the men, without Engineer equipment in most cases, it is subject to be moved to another site at any moment to make room for some other installation. It may be true that the new installation is more important and of high priority and entitled to the site, but it does not make the work any easier for the men, and no amount of persuasive explanations by platoon officers can ease the discouragement and disgust the movement orders cause. Only good entertainment will aid the men to tolerate and forget.

Great as the handicaps appear, there *are* remedies. Several partial minor remedies added together may almost totally alleviate the situation. All should be tested.

Since one or two officers can hardly cover the sections adequately, the Chiefs of Section must be coached and instructed to carry on. They must be provided with interesting material, collected and prepared by the officers concerned; outlines and programs simple to follow and understand, and with a continuity of purpose.

To begin, each section should be amply supplied with all available entertainment materials, such as a good radio and a library of books. The G.I. radio now issued is excellent and fills the purpose admirably, in many outposts reaching the United States by shortwave. The Armed Services Edition of paper books, plus field libraries circulat-

ing in the theater, offer sufficient reading matter. Personally-owned volumes may be borrowed from personnel and rotated among the sections.

The Armed Forces Institute courses, once the men are taught their value and become interested, are valuable "time-occupiers."

A *must* in all AW batteries is a good motion picture projector. Too many batteries in the field rely on the battalion machine which comes around only at great intervals. Though other outfits may need but one showing of a film to cover all the personnel, an AW battery must make nine separate showings. Motion pictures are simple to run, easily secured, and of tremendous interest to most men, so every effort should be expended to provide them frequently. With a battery-fund projector, two shows a night could be run, covering the unit in four nights, and the men would be content. Late releases of films arrive early in advanced theaters, and men like nothing better than to see a new movie before the home folks do. In conjunction with the overseas movie program, however, a law should be passed prohibiting the shipment of inane pictures which show a soldier going overseas, becoming a hero, and returning home on furlough, all in three months. A recent film did just that!

The battery should purchase subscriptions to publications like *Time*, *Newsweek*, *COAST ARTILLERY JOURNAL*, *Yank*, *Army Times*, and a popular weekly magazine or two. Also a newspaper which emphasizes the war in your area; such as a Honolulu or San Francisco daily for Pacific outfits, a New York or London newspaper for European theater units, a Florida or New Orleans sheet for Caribbean AW batteries, a Seattle or Fairbanks newspaper for Alaskan organizations.

These publications, with army Intelligence Bulletins added, provide not only news details of the global war, but give the Information and Educational Officer countless stories for background material and color to spice his talks.

From the newspapers, too, will come clippings for a set (nine) of "Information Boards," a good way to spread interesting news matter to all sections. These boards are of plywood (or similar material), about two by three feet in size, and equipped with an eyehook on top so they can be hung from a wall or bulletin board. On the boards are pasted newsclippings, pertinent maps, and various items of home topics or postwar briefs. A pinup can add interest, or a few G.I. jokes. Each board is different, and they are rotated from section to section, including headquarters, staying about three days in each position. The chow truck used in field situations can transport the boards. When a board has completed the circuit it is re-pasted with new items and started anew. These boards have proved very popular in actual use.

An interesting idea for I&E talks is supplied by enemy radio propaganda. It is now employed by some stateside stations in a transcription program called "Radio Tokyo Lies." With radios, the AW personnel will, of course, hear enemy propaganda. Some of it is so absurd it passes for comedy and the men laugh it off, but other propaganda may be subtle and clever enough to create an impression. This matter the I&E Officer should note, and prepare a

rebuttal for, and offer it to the battery through the Chiefs of Section.

On a larger scale, this idea may be instituted on the nearest G.I. transmitting station, in a regular daily or semi-weekly program debunking enemy propaganda, statement for statement. A more even dissemination is accomplished in this matter. The whole affair may develop into a lively game between the enemy program and yours.

Long as we have an army, we will have griping. We realize that and are resigned to it, but griping, ungoverned, is a menace to morale, and therefore a direct concern of the Morale Officer. One good trick is to turn gripes into "suggestions."

Organize an informal "suggestions box" in the battery. Ask for constructive suggestions for improvements on anything—matériel, training, food. Negative gripes are stilled to a large extent by this program, for a grumbler can be told, "If you have an idea for bettering the situation, let's hear it. Otherwise, shut up!"

The double-tent setup came from an enlisted man's idea from such a suggestion program. Two pyramidal tents are allotted an AW section. Rather than make two floors, sixteen by sixteen, however, only one floor is made—sixteen by forty feet. The two tents are placed on the same floor with the two inner wallflaps raised to form a roof over the middle area. Result—large, roomy quarters. The center, with a table and radio and bookshelves becomes the living room. Also, the Chief of Section can speak to any of his men from his own bunk, without crossing to another tent.

Other improvements offered as "counter-gripes" are familiar to most AW people. Simple things, such as a bet-

ter way to open C Ration cans so most of the beans won't run down your hands before the can is completely open, to Ordnance items such as a .50 cal. machine water pump operated by recoil during firing (firing the regular handpump would be used for cooling).

Some of the pertinent suggestions on armament received include: (1) a tube cleaner for the 40mm gun: a device attached to the cleaning rod, with flexible, fingered end of brass fitting into the grooves of the barrel to remove copper filings and carbon; to expand and contract, by spring, to fit the barrel diameter; (2) a temperature gauge for power generator: in case of a sudden water leak, due to rough handling in transit or a gunfire hole, overheating will be noted too late without a gauge; (3) a coincidence range finder on the M5 director, as a training aid in range estimation for the range setter; (4) a third open sight for the 40mm gun, combining both lateral and vertical sights to allow the gunner or section chief to judge what lead pointers are maintaining in sight control tracking direction; (5) replacing of all zippers on gun covers by good latches because dust plus rain equals mud, which jams and breaks zippers; (6) a four-inch extension mount for the breaker switch on the 40mm gun, moving the assembly to the rear and clearing the front stake so it can be driven without danger of smashing the switch.

How about them, Ordnance?

Once in the active field, an AW section receives a lot of breaks—give it all you can. Of course, the greatest morale uplift of all, is the opportunity to fire at enemy planes after months and months of dry run drills and towed sled targets!

# Coast Artillery Report from Eniwetok

By Private First Class John P. McCormick

"You did a grand job, and I'm proud of you!" our Colonel said when he spoke to the troops aboard the transport that was bringing them out of the Marshalls. "You did a grand job—!" What job can the Coast Artillery do beyond being the first line of defense?

During our stay in the Marshalls, our jobs were many and varied. When the Admiral of the —— Island fleet brought his flagship into drydock for repairs, the battery was resting from its labors. Not always was it drudgery and work, for here with white coral sand and a blue sky mirrored in the clear water of the lagoon, men can relax and swim and play. Our Admiral had a boat made from the castaway extra gas tanks from a plane and in this he went to go off in search of shellfish. Everything that was ever meant to intrigue our northern senses was here, except natives. But the moon was big and round and very beautiful, and the stars hung so low that you could reach up and

grab yourself a handful of stardust from the Milky Way. Picture our beautiful lagoon on a moonlight night. Romantic is the word for it.

Our island had all the palm trees standing as they had stood for countless numbers of years; cool, green and delicious to look at. But the tortuous path that led to this little tropical Eden was beset with all that Mars can show a soldier about war. For the way up led past Kwajalein with its big Jap garrison either dead or prisoners. The Coast Artilleryman's moral fiber is of great strength, his nerve the equal of any man in the service. For here on the way up a stop had to be made at Kwajalein, a working stop.

For eight days the men worked on two of the islands of the Atoll—worked, slept, and stood guard for snipers while they got rid of that smell of rotting flesh. Japanese bodies in all stages of decomposition were laid in their final resting spot amid the war-ravaged islands. While the gun crew

carried the dead the tractor drivers hauled supplies and medicine up to the front line troops. Here is a special brand of courage—the man who can sit so high up above the world where snipers have a perfect target, and carry out his assignment.

When the cleanup job was completed to a degree, the Coast Artillery moved on, on up the Marshalls to Eniwetok Atoll. Here was to be our base of operations. The battle for Engebi went down in history as a glorious victory for the Marine Corps, and justly so. But again our battery sent out details to Engebi, and again they smelled that sweet sickly odor of rotting flesh, but this time they were spared the touching or even having anything to do with the dead except the sickening odor. The odor of death destroys the appetite for food; men become sick spiritually and physically; they become incapable of properly fulfilling their functions as soldiers while the stomach won't accept food. But again this was part of the job that the Colonel spoke of. So it was a tired and weary lot of men who landed the equipment, but land it they did. Guns were set up in position and a garrison was born in this Pacific base.

The Quartermaster Corps had a call on our service too. Supplies essential to the maintenance of the garrisons and the movement of the combat troops had to be handled daily. Until the "Out of Action" order had been issued to this particular battery, these details went out to aid in the distribution of rations and in the maintenance of our supply lines. Yet meanwhile sandbag positions had to be built, the staggered rows of tents went up, a kitchen was built and a day room was set up on this edge of civilization. Captured Jap cement was used to lay floors and build powder rooms in the gun pits. Work, work and more work, all day and some nights, for the tides are tricky down here and barges can only come in when tide permits. Landing supplies, shells and equipment, laying sandbags around the powder pits, all were parts of the job mentioned by the Colonel.

Gradually the routine work of a garrison asserted itself. The last sandbag was set in place, the last shell case landed, the last case of powder was put in the pits and the work

of maintaining the garrison took place of the work of building the garrison. Of course the Japs didn't forget that American troops were in the Marshalls. The little monkey men sent bombers in to hamper the work, and on two occasions they got right into our network of AA defense. The first raid was a particularly heavy one, and while the bombing was at its height the men had to dig a hole to crawl into. Two of our stalwarts were out on the beach digging away for dear life, and one fellow was getting his hole dug a lot faster than the other and the laggard was getting plenty of grey hairs from sheer worry. "Posey," said the laggard, "let me use that shovel when you get through. I'm not getting anywhere with this helmet."

"What shovel?" Posey paused for the merest fraction of a second as he answered. "I'm using my hands."

But, thanks to the Air Corps and the very accurate fire of the Ack Acks, the Jap planes couldn't get in, though they tried often enough. The work of maintaining our coastal defense was uninterrupted except for those two raids.

Now that the job was mere maintenance, the men could turn their minds toward relaxation in the good old American way: baseball and volley ball, swimming and boating. Now the Admiral of the fleet could make a boat and build a raft, now the men could clear away a baseball diamond, now at last they could relax a bit.

That was the job that the Colonel complimented his men on, that was the job that had been completed. The idyllic stage of life was reached only after a lot of hard work, and the idyll was only on the surface. The men played about, swam and hunted shells and did their routine work. But civilization was a long way off, and these men were used to the luxuries of ordinary Army life in a garrison. Boiling beneath the surface was the boredom of being on the small island itself, of seeing the same faces, eating the same dehydrated chow every day and doing the same old things. Here we still have our beautiful palms untouched by bomb or shell. There are no bomb craters on this little rock, but month after month it goes on, the same identical routine.

That is the job that we did.

# Turnabout\*

By Lieutenant Colonel Bernard S. Waterman  
(Coast Artillery Corps) FA

This is a story of the conversion of a seacoast artillery long Tom battalion to field artillery. It is written with the hope that it may benefit other units going through the same conversion. It will doubtless be of more interest to the Coast Artilleryman who is being converted than to the Field Artilleryman who is conducting the conversion, since

it represents a Coast Artilleryman's idea of what happened to him.

Toward the end of March, 1944, my coast artillery battalion was standing guard in a desultory fashion on the shore line of a comfortably secure pacific base, its major combat problem consisting of how to cope with the swarms of inspectors from higher headquarters who infested the neighborhood. Eight weeks later, the same battalion, com-

\*With apologies to Thorne Smith, whose novel of the same name did NOT inspire this article.

pletely transformed into a Field Artillery organization, was on the high seas, bound for Saipan. Since this battalion is perhaps one of the first of those converted from Seacoast to Field Artillery to participate in combat, its problems and the results obtained, should be of value to others about to undergo like experiences.

The first consideration was whether it was necessary to convert at all. Some Coast Artillerymen, recalling the employment of Coast Artillery GPF's as corps and army artillery in the last war, felt that such conversion was unnecessary—that the task of general support of ground forces could be as readily accomplished using seacoast artillery position finding methods and instruments, and that the possession of these instruments would be highly desirable should the battalion be needed for seacoast defense missions. Further, retention of the Seacoast Artillery methods and equipment would eliminate the entire retraining problem. On the other hand, conversion to the Field Artillery T/O offered a considerable economy of personnel, and—the most vital consideration—if successful operation in combat was to be assured we must, for the sake of simplicity and clarity, be able to talk the same language as the rest of the artillery which we were intended to support or reinforce.

The training of a Field Artillery battalion is not a difficult problem under normal conditions where the officer personnel consists of Field Artillery officers who are graduates of the Battery Officers' Course or OCS at Fort Sill, and have been thoroughly indoctrinated in Field Artillery methods. When all the officers of the battalion must also be taught Field Artillery methods the steed takes on an entirely different hue. It is perhaps even more difficult if the officers know Coast Artillery terminology and practices than if they knew nothing more than simple trigonometry and the law of probability, for the two branches employ a great many terms which are enough alike to the ear so that they might be expected to connote the same thing to each, but which on examination prove to mean one thing in a meadow, and another on the seashore. The confusion of terms is apt to obscure the fact that there is no difference in basic principles. When this fog begins to clear away the Coast Artilleryman appreciates the fact that in placing fire on targets which are fixed or stationary the elaborate plotting room equipment, which is so necessary to the computation of firing data on rapidly moving targets, becomes so much excess baggage.

This battalion was fortunate in having assigned at the commencement of retraining four field artillery officers who assumed the duties of S-3 and firing battery executives, and whose services were invaluable. However, these officers at first found themselves in the position of a Frenchman, unable to speak English, attempting to teach French to an Englishman who speaks only English. It was difficult to find a ground for common thought. The optimum solution to this problem, where time permits, is to send a small group of the battalion's quickest-learning officers to the Battery Officers Course at Fort Sill. On their return they should be able to speak both the language they are to teach, and the one their prospective students understand.

The task of reorganization proved relatively simple, one of the major problems being to teach the chiefs of section

not to refer to themselves as "gun commanders," a term which is anathema to the field artillery. The plotting room and instrument personnel readily fitted into the jobs of battery detail, recorders, computers, etc., with the chief plotter becoming the chief of detail. The battalion master gunner and operations sections were easily adapted to positions in the survey section, as fire direction computers, and horizontal and vertical control operators. Some battalion commanders may find themselves confronted with a real problem in the person of the master gunner himself. The master gunner is likely to be a man of considerable versatility and technical attainments. In the semimobile battalion he is a technical sergeant, and upon conversion is reluctant to ask him to take a reduction to staff sergeant to be a survey sergeant, and equally loath to lose him as default. A hasty perusal of the qualifications of the sergeant major in TM 6-605, "Unit and Individual Training Standards," will reveal that he, too, is expected to be a man of many technical attainments—very different from the swivel chair commando type of sergeant major to whom we have grown accustomed. It is probable that it will be much easier to teach the master gunner what he needs to know about paper work than to teach the Coast Artillery sergeant major the technical material pertaining to fire direction survey, and field command post work which the Field Artillery sergeant major must know. The only noticeable deficiencies after the aforementioned reshufflings were accomplished consisted of a lack of adequate survey training on the part of the battery survey personnel, and an insufficiency of trained radio personnel.

The seven weeks training period which was all the time available between the decision to convert to field artillery and the scheduled sailing date was a mad whirl during which the few people who knew the answers tried to impart them in colossal doses to the many who did not. To complicate the task still further many vitally necessary items of equipment were not on hand. As an example our guns were equipped with Coast Artillery sights, graduated counterclockwise in degrees and hundredths, and nearly half of the available training time elapsed before they could be replaced with Field Artillery sights.<sup>1</sup> The delay was occasioned by the lack, in this theater, of the proper sight mounts. This problem was solved in a highly ingenious manner by the ordnance officer. It will be recalled by those familiar with the 155mm gun, M1, that there is mounted on the left hand side of the carriage a sight box which contains a cup-shaped bracket for carrying the sight. The cup is of the proper size for the field artillery series of sights such as the M5 and M12, but is only a rough casting. Ordnance personnel removed these cups, machined them to provide bearing surface for the sights, equipped them with a set screw to hold the sights rigidly in place, and then installed them on the sight mounts in place of the larger cup bracket which accommodates the M8 Coast Artillery sight.

The lack of proper sighting equipment should not, however, be permitted to hamper the training of gunners.

<sup>1</sup>It would be a great advantage all around if sights for Seacoast and Field Artillery were standardized and a common origin for O° azimuth, common scales, and the same directions of increasing azimuth were adopted.—EDITOR.

as the Coast Artillery refers to them—gun pointers. If aiming circles, MI, are available gunners can be taught all the operations of laying the guns, measuring deflections, applying shifts, and correcting for misalignment of aiming stakes.

Cannoneer training was not difficult since the service of the piece differs in only one or two minor respects. One additional battery was added to the battalion to meet the field artillery requirement of three firing batteries per battalion. This battery was brought in from a tiny Pacific outpost where it had manned the seacoast defenses, and, since it had no training on the Long Tom, was forced to start from scratch on the training of firing sections.

A great deal of stress was placed on RSOP's—reconnaissance, selection, and occupation of positions—both nonfiring and firing. The commanders of higher echelons in the organization of which we were to become a part anticipated that as seacoast troops we would be deficient in tactical movement and occupation of field positions. This was not entirely the case because of numerous field exercises and maneuvers in which we had participated in continental U. S., where the battalion was completely mobile, but it was nevertheless true that very little stress had been placed on rapidity of occupation, and much more training was needed. It is particularly desirable to have as many RSOP's as possible culminate in firing, both to check the accuracy of survey and to guard against the tendency to be hasty and careless in the emplacement and laying of the battery. Any artilleryman will well appreciate the delight experienced by all hands when—about our third time out—the first round of registration was observed to fall squarely on the outcropping of rock which we had selected as our base point, at a range of 10,000 yards, proving that the survey and the laying of the battery were perfect. (Or that the errors in each were exactly compensating.)

Among the features of this training program were two short periods of amphibious training. One battery participated in a series of tests, using the various types of landing craft, to determine how they might be most advantageously employed in placing our heavy equipment ashore. The remainder of the battalion conducted practice loadings and landings using an LST. The latter exercise proved of immeasurable value in planning for the operation in which the battalion subsequently participated.

It is not intended to provide the reader with a blow-by-blow description of our combat experiences, but only to use certain high lights thereof to emphasize suggestions for training or planning.

In addition to our own combat equipment there were included in the loads aboard the LST's which transported two items of equipment which are particularly worthy of mention, the bulldozer and the DUKW. Two bulldozers for the temporary use of the battalion, and some twenty-five DUKW's of a company attached to a higher artillery echelon were loaded aboard our LST's. Next to the gun itself the bulldozer is perhaps the most essential item of equipment on the list. Every firing battery should have one. It will save many hours of time and man-hours of labor in the preparation of gun emplacements, ammunition dumps and protected CP facilities and it is virtually essential to a landing operation, because of its ability to operate in much

deeper water than any other piece of mobile equipment. DUKW's, too, are very valuable because they can debouch from LST's offshore and place reconnaissance elements ashore early in the game. In our own case three days elapsed between the arrival of the last LST and the commencement of unloading, and without the DUKW's the reconnaissance parties might have been compelled to remain aboard. Our DUKW's were loaded with ammunition, with the exception of one, which carried the battalion commander's peep. It is strongly recommended that under such circumstances as are mentioned above enough DUKW's be loaded with peeps to provide transportation for all reconnaissance personnel. Ammunition carried on the tank deck will be available in ample time to insure initial supply.

Our landing problem proved very different from that of the training exercise, for Saipan is fringed by a reef which is about a quarter of a mile offshore at the landing beaches which were in use. This was a complicating factor, but not an insurmountable one, because the lagoon is shallow enough at low tide to permit the passage of vehicles. At this stage in the narrative it is unnecessary to relate in precise detail the occurrences incident to the landing operation. The points which I now enumerate will themselves furnish a clue to what happened, and these points are: 1) Do not fail to obtain exact tide information from Navy beach personnel, and 2) when the water is deeper than the hub caps hitch your vehicles behind a bulldozer before starting them ashore.

The battalion went into position and registered without untoward incident, using air observation for base point registration. OP details were sent forward to seek terrestrial observation, and at this stage in the proceedings another of the facts of life in the heavy artillery became apparent—that the problems of ground observation are far more difficult than in light direct-support artillery, because the minimum range line is much farther ahead of the troops. Only when a dominating terrain feature is attained may targets suitable to heavy artillery be discovered. The ineffectiveness of ground observation places the major burden of the discovery of targets and adjustment of fire on our air observers. This brought out an important point which ought to be given consideration in the early stages of conversion of a battalion from Coast to Field Artillery—the selection and training of reconnaissance officers. The natural and normal thing is to make the range officer the reconnaissance officer. This we did, and it seemed like a fine idea at the time. Not until it became apparent that our chief reliance must be on air observation did the realization come that two of our three RO's were too heavy to get off the ground in the low powered L-4 Cub. In selecting reconnaissance officers consideration should be given to the following qualities: intrepidity, light weight, good eyesight, freedom from *mal-de-mer*, and knowledge of survey procedures. They should then be given a great deal of actual air observation practice.

Immediately upon seizure by the front-line troops of Mount Tapotchau, the dominating terrain feature, we established an OP at its very summit. At last we had observation nearly adequate to our needs, hampered only by occasional flying lead. Even here the work was mainly

watching and waiting, though some profitable targets were discovered and effective fire delivered on them. It is essential that the observers who do this work be possessed not only of good eyesight, but also of judgment and infinite patience. Good tools help, too. Many of our best targets were discovered for us by a Marine who had a pair of twenty-power binoculars. Our own twenty-power instrument was a one-eyed telescope and the strain of one-eyed observation was severe.

During the campaign we fired nearly 20,000 rounds. Supercharge was used for the greater share of these rounds, and it is safe to say that supercharge will always be used for the greater share, because higher echelons are desirous of employing the long range of the gun to strike deep into enemy areas. The reader can well picture the condition of the gun tubes at the close of the campaign. Officers concerned with supply would do well to plan for a replace-

ment tube for each gun, to be available about D plus

In conclusion, we would like, as is the custom in such chronicles as this, to make a few suggestions concerning sundry articles of equipment in excess of T/E which it is well to bring along. If you, as battalion commander, find yourself saying: "Leave all that recreation junk behind. We're going out to fight a battle," recall those words quickly for if you don't you'll find yourself eating them later. Our battalion fired the last round on 1 August, and as this article is written over two months later, we are still "somewhere in the Marianas." You can play a lot of volleyball and football in two months. Radios are wonderful to have, as fast as bases are seized local radio stations go into operation with the very best of programs, canned in the States for overseas forces. Remember, activity and morale are tightly interlocked. Together they rise and together they fall.

# In Front of the Infantry

By Lieutenant Colonel William R. Kinter, Coast Artillery Corps

Time and again the fortunes of this war have taken the AA gunner's eyes from the skies to seek out the enemy on the ground. It's taken for granted that AA can take either the *Luftwaffe* or the *Wehrmacht* in stride, although it isn't supposed to be normal for our flak artists to be cast in infantry rôles. Perhaps the story of Battery A versus the *Wehrmacht* at Wallendorf, Germany will give an inkling as to how AA troops get into and shape up in a ground encounter.

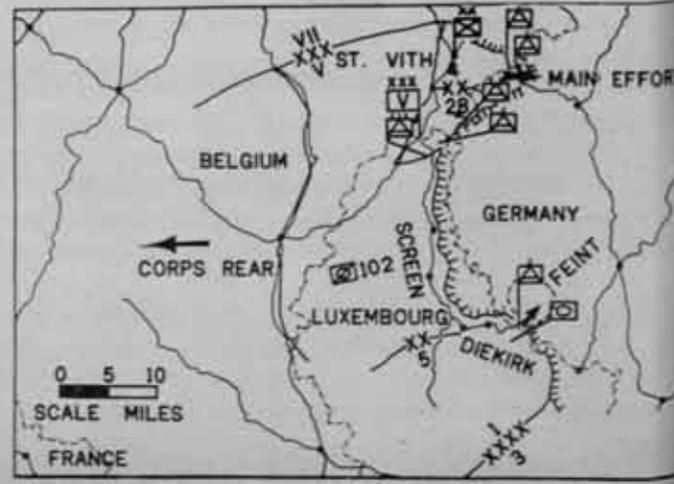
The 1st was an Automatic Weapons Battalion operating with the V Corps of the First Army. Its normal job was keeping the *Luftwaffe* away from various Corps Field Artillery battalions with an occasional front-line bridge thrown in. At the time of this action Battery A was with the FA Battalion, then attached to the 5th Armored Division. Early in September the V Corps was deployed along the German Luxembourg border on the Siegfried Line with a front of about seventy miles.

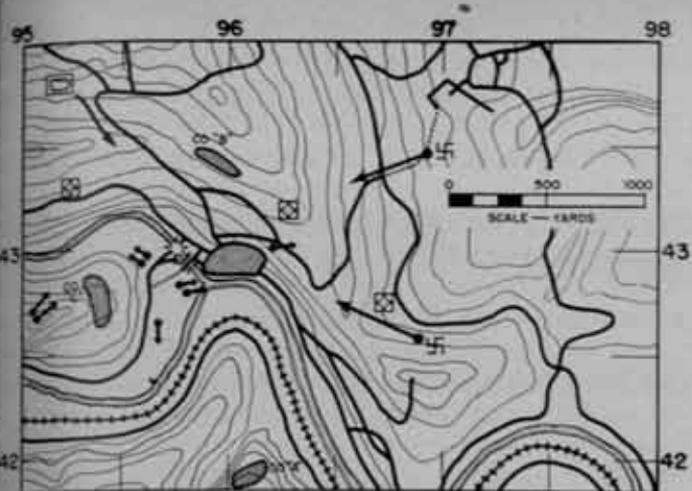
To the north the VII Corps was preparing for the Aachen thrust, while the Third Army established contact on the south flank. With but two infantry divisions and one armored division, it was impossible to make a serious penetration of the line in this sector but it was essential to create diversions to assure success for the main First Army effort farther north. It was decided to concentrate the two infantry divisions around St. Vith while the armored division would make a separate feint into Germany around Wallendorf. Between these two forces a light cavalry screen was thrown up to cover the intervening stretch of about thirty miles. At this time three of the AA batteries of the 1st were operating with EA battalions that were directly attached to the divisions while the remaining battery was with FA in support of the 4th Division; thus the batteries

were spread over a distance of some fifty miles or more.

On the afternoon of 14 September while checking Battery A which was then working with the armored division I had an opportunity to watch the armored attack into Germany get under way. At the sector of this attack a river was the German-Luxembourg border. Hills about 100 meters high rose sharply on both sides. I can remember watching from the vantage point of these hills the German propelled 155's throwing their high explosives into German towns while the Luxembourgers, in festive mood cheered each salvo with carnival enthusiasm. Less than a week later I was to see this same unit under less happy conditions.

On Sunday 17 September we received orders from the Corps Group Commander to provide AA protection for the Engineer bridge built at Wallendorf for the Armored Division entrance into Germany. We planned to give the





mission to A Battery which was already in that region. Our only communication with that battery was by means of a battery officer who made the fifty mile trip once a day. Lt. Fjellen arrived at dusk from A Battery but could not return to his unit until the next day as active German patrols were coming through the cavalry screen. One had captured our Battalion Executive Officer on the main North-South road that same afternoon and we could not risk losing another officer and jeep by sending him home after dark. He got back the next day, however, and gave the BC the order to detach a platoon for the bridge job. The armored combat commands to which A Battery was attached had been undergoing extensive artillery fire for several days so the platoon took this assignment to the comparative security of this bridge with some feeling of relief. By dusk of the 18th they were set up at the bridge on the marshy ground of the river valley.

Around noon of the following day my group commander called me in and stated that a German counterattack had resulted in the capture of Wallendorf and he guessed we had lost a platoon. There was no definite information available at Corps Headquarters so the only thing to do was to climb back into the jeep and go to the scene. After passing through Diekirk it was evident that all was not well within the German pocket. Vehicles of all sorts of units were coming from the direction of the bridge with little semblance of order. No one knew the score. Constantly bucking traffic and sifting the MP's extravagant estimate of the situation we finally arrived at the bridge site. There I found the platoon just reoccupying positions that they had abandoned. The men were in an excited and nervous state. Several had been seriously wounded and evacuated. By going around from section to section I was able to find out what had happened.

At about 1000 hours on the 19th as the morning fog began to rise from the valley, mortar and small-arms fire began to fall around the bridge. It was apparent that a German force had come into the town from the northeast under cover of the fog. (See Map 2.) As the fire increased the Engineers working at the bridge withdrew from the valley. At 1100 hours three men on No. 6 gun crew were wounded. Our infantry which was on the enemy side of the river began filtering back across the river. Gun No. 6 was in an exposed position beside the river and considerable small-arms fire was directed at it. An infantry officer called

the platoon CP from that gun and told the AA they had better get out of there as the enemy were coming down over the hill. At that time the enemy fire increased. The platoon commander decided to withdraw. In the excitement of the action he told them to move out even if they had to abandon equipment. One gun section came out with its gun; the other left its gun behind.

The elements of the platoon were soon scattered down the road for several miles. The commanding officer of another AAA SP Battalion saw scattered elements of the platoon and ordered them back to the bridge. At the same time he saw the platoon commander and ordered him to take his platoon back. The platoon commander located and assembled his platoon and returned to the bridge.

This story was told to me while a continuous stream of vehicles, all showing effects of artillery fire, passed over the bridge. A general withdrawal from the pocket under strong German pressure was taking place. Tires were burning, wounded men were seeking medics, on the ridge the shelling could be heard, and the brilliant fire of burning vehicles lit the sky. There was only an hour to nightfall and it was obvious that some plans had to be made for holding the bridge in order to safeguard the withdrawal of the troops remaining inside the pocket. There were no troops except AA on the spot. We had to find quickly the division G-3 and find out the division's plans. It was natural that in the confusion attendant to the withdrawal that the G-3 would not know the full details of the situation at the bridge. He was quite surprised to find that there was no infantry in that vicinity (a regimental combat team had been attached to the division for some time). Upon being advised of the situation there, the G-3 arranged to send back to the bridge one infantry battalion that had been in the thick of it for about five days and had just been pulled out for rest some five hours ago. Before leaving the G-3 a meeting with the infantry battalion commanding officer was arranged to coordinate the bridge defenses.

On the road back to the bridge from the visit to the G-3, elements of the other platoon that was inside the pocket were seen coming back in column with its Field Artillery battalion. Half-tracks and water-cooled .50 caliber machine guns of that platoon were ordered to pull off the road and to return to the bridge to supplement the defenses. Before it was too dark to move around we had four half-tracks, three Bofors and a number of .50-caliber machine guns set up around the bridge in a perimeter defense with one half-track set up right at the bridge.

At about 2100 hours Company B of the infantry arrived to take up positions on the crest of the hill above Wallendorf. A liaison officer was sent with the company commander to learn their dispositions. The commanding officer of the company desired a machine gun which was turned over to him complete with crew. This machine gun became the key of the B Company defenses. The battery commander took two machine guns to the top of the hill where Company C was to be deployed and coordinated outpost security with the commanding officer of that company. The commanding officer of Company B returned from his reconnaissance and stated that he had too few men properly to defend the ridge line. It was then arranged to set up a horseshoe outpost defense about two to three hun-

dred yards from the bridge to alert the close-in defense of enemy infiltration during the night. Plans were made to give him supporting fire and for his company to clear the area above town if it became necessary to deliver fire there. Upon the completion of these arrangements a trip was made to the Infantry battalion command post to advise the Battalion commanding officer of the set-up.

All during the night a steady passage of retreating vehicles went by our position—tanks, ambulances, ammo trucks—the entire wheeled paraphernalia of an armored outfit. At about 0400 hours this mechanized roar changed to the slogging tread of infantry—the last infantry battalion in the pocket was pulling back. This made us uncomfortable.

At 0550 hours action started with the firing of several rounds of German bazookas at the M-16 near the bridge. Small-arms fire was heard. The crew of No. 12 M-16 spotted in the half light of dawn a German patrol attempting to blow the bridge. The squad commander closed in on the patrol and at a range of fifteen yards killed the officer leading it and severely wounded and captured three prisoners.

Sporadic German machine-gun fire began which was persistent throughout the morning. Intermittent mortar and *nebelwerfer* fire of varying intensity began and lasted throughout the day. Whenever fire began, AA Bofors and MG's blanketed the town and hills and quickly silenced it. One man on a Bofors gun was killed by machine-gun fire. It was decided to take two of the unprotected Bofors out of the area and in their place set up two additional .50-caliber MG's, which were dug in under fire. M-16 crews were instructed to change positions about 100 yards every half-hour, to prevent their being accurately ranged by enemy mortar. Close liaison was maintained with infantry and fire was delivered anywhere upon request. During this period the .50 caliber MG located on the hillside destroyed at least one German MG and killed or pinned down a considerable number of Germans infiltrating down the hill. The bridge was under sporadic small-arms fire at this time.

Because the attack was increasing in intensity and because the AA weapons had to be deployed in full observation of the enemy and had no individual protection, the battalion CO again went to the Division G-3 and requested that armor be sent there to replace them. G-3 directed to hold on and he would come up to look over the situation. He further stated that the infantry battalion that had been withdrawn during the night would be ordered to retake its former position beyond the ridge line. A telephone to the bridge area was set up by the division.

At 1100 hours the division G-3 was called and asked when relief would arrive. The G-3 stated that the infantry battalion was on its way and that some light tanks would be sent there. The battalion CO advised the G-3 at that time in view of the importance of the place and the fact that it was under enemy observation, the -st AA would not be withdrawn until the tanks arrived. After that, two M-16's would be left at the bridge to provide purely AA defense. These M-16's would be taken out at dusk and re-

turned the next morning at daybreak. The G-3 stated that this was satisfactory.

At 1230 hours the 2d Infantry Battalion started to move through the gap. Its advance was held up by fire from the town. At this time heavy artillery concentrations began to fall along the road, and continued at intervals throughout the afternoon. At 1300 hours the first light tanks came in position near the bridge. The Battalion CO advised the Battery CO, Captain Sims, to tell his men they were going to be pulled out and to begin to do so.

At about 1400 hours our armor started to come down the hill. They were fired at by the Germans and in return began to shoot up everything in the area. They went past the AA without stopping. The mortar and artillery fire increased especially as vehicles approached the open space between the town on our side of the bridge. The relieving infantry, composed mostly of replacements, withdrew.

At 1430 hours the BC began to withdraw all of his units except two M-16's. At 1500 hours the tanks pulled out and the AA M-16's followed them. A half-hour later the situation improved so that the BC returned to the bridge with two M-16's and remained until dusk. Later in the afternoon two M-16's of the other AA battalion returned to the bridge and remained there all night.

The BC returned to the bridge the next morning, September 12, with two M-16's. He found that both of the bridges had been blown but stayed to provide cover for Engineers who were supposed to try and build another bridge. While waiting, under fire, for the Engineers a M-16 was hit by mortar and bazooka fire and destroyed. The BC and two members of the crew were wounded, and one infantry soldier standing there was killed. The remaining M-16 withdrew from the untenable position. Two M-16's of the other AA battalion were also at the bridge the next morning. One of them was destroyed at the same time the other withdrew.

Elements of the battery that were in this engagement were sent to the vicinity of an Ordnance company where repairs of vehicles were begun. Every vehicle needed repairs due to effect of fragments and small-arms fire. In addition one 40mm gun was damaged by small-arms fire. One M-16 was completely destroyed. Notwithstanding this damage efficient Ordnance service put them back on the job the next day, with the exception of the one M-16.

Nine casualties were sustained by the approximately eighty men that were in this action. The devotion to duty and indifference to danger displayed by the personnel of this battery was characteristic of many similar engagements from which all AA can derive justifiable pride.

This action brings to light some of the confusion that exists in war, especially in unfavorable circumstances. Lack of information, poor communication, the uncertain reaction of replacements when first under fire, the necessity for keeping with a mission and the need for commanders to have responsible people at the vital spots can be found here. More particularly it shows that well-trained AA troops armed with weapons that can deliver more lead per second than any other are a definite ace in the hole to any ground commander.

# Employment of Half-track Multiple .50's

By Lieutenant Colonel George R. Clemens, Coast Artillery Corps

In March 1944 the Commanding Officer, 457th AAA Bn. Mbl. was advised he would be a part of the D-day landing force. Landing would be made on Omaha Beach, and the mission would be to provide the initial 40mm gun defense of the Beach Exits and Beach Maintenance Area. To carry out this mission, the unit was equipped with 32 40mm Bofors, 32 water cooled machine guns and 16 M-16 half-tracks. To provide a strong initial half-track force, the Army Command decided to use two additional battalions of half-tracks, to be landed a short time before the Bofors and then to pass to the flanks as the Bofors battalion took over the central area around the main beach exit. As the two self-propelled battalions had a total of 128 half-tracks, the Army decided to leave the half-tracks of this battalion to be landed later in the operations. The half-tracks of the self-propelled battalions did an excellent job in protecting the lower part of the exits and storming some of the emplacements covering the exits. The battalion landed as planned, and established the defense of the Beach Exits by the night of D plus 1.

The 16 half-tracks belonging to the battalion were landed later in June, and organized initially into four provisional platoons, one per lettered battery. Two platoons were employed on the beach level to give AA protection to the lower beach. The beach itself was a comparatively narrow strip of sand with hills rising rather abruptly a short distance from the water's edge. The Bofors were emplaced on the plateau above the beach, and would have had to be depressed below zero degrees to fire on a strafing plane flying just above beach level. By using the half-tracks on the beach level a good combined defense was obtained.

One platoon was emplaced to give close-in defense to beach exits, and the last platoon used for close-in defense of gasoline storage tanks. This type of defense worked very well in that the dispersed gas storage tanks covered a considerable area, and by placing the half-tracks close to the tanks, the Bofors could be spread to better cover the approaches.

Following missions at the beaches, the unit was assigned various airfield protection missions with the First Army. The habitual employment of half-tracks was close in to the runways or dispersal areas to protect these installations while spreading the Bofors to cover approach from any direction.

On August first the unit was assigned to the Third Army, and given a variety of missions in protection of vital Command Posts, supply dumps and road bottlenecks. Here again the half-tracks proved their value in that the half-track platoon of each battery could set up an inner defense with the guns forming an outer ring. By this method of employment, each battery had 12 fire units to emplace 8 guns and 4 tracks.

The later part of the month of August the battalion was attached to XII Corps, and the half-tracks from two batteries were formed into a provisional battery and attached to the 2d Cavalry Squadron. This battery was formed in 2 platoons of 4 tracks each, with a Battery Headquarters consisting of a Battery Commanding Officer and Executive Officer, and a minimum of Headquarters personnel. The platoons were used with Cavalry troops protecting their columns on the road and outposting one half-track with a road block when on patrols. The best day's work on column protection occurred late in August near Commercy, where the half-tracks with one platoon shot down three ME 109's which attempted to strafe the column.

The half-tracks with patrols had many interesting and exciting experiences. On the afternoon of 27 August 1944, a half-track on patrol was in the village of Bar-sur-Seine with several Cavalry vehicles on a roadblock at this point protecting the Corps right flank. Their mission was to destroy or divert the miscellaneous enemy convoys fleeing from the Seventh Army pushing up from the south from the flank of the XII Corps, which was spearheading the southern sector of the Third Army drive to the east. During the afternoon two small convoys were destroyed—one consisting of two vehicles and a gun, and another of five vehicles. Late in the afternoon, the lieutenant in charge of the group decided to withdraw before he encountered an enemy group too large to handle. He started his convoy on the road toward Juilly and had barely gotten under way when he met an enemy convoy parked on the road facing them. This convoy had apparently stopped to investigate when they heard the firing in town. It was practically dark and there was nothing to do but make a run for it. The half-track charged down the road with two Cavalry reconnaissance cars. Its multiple-50's were used to rake the German vehicles as they passed, and fourteen or fifteen enemy vehicles and a considerable number of troops were destroyed before the track itself was destroyed by a direct hit on one front wheel by a shell from an 88 which was part of the convoy. The crew escaped in one of the Cavalry reconnaissance cars.

During the period from 17 to 20 September, the half-tracks had many ground engagements. It was during this period that the Germans counterattacked from the east and drove in the Cavalry screen from in front of the Third Army. The 2d Cavalry, with the half-tracks attached, had penetrated to the east of the Forest of Parroy. (It took the 79th Infantry Division days of bloody fighting to retake this forest over a month later.) Advance elements of the German forces began to run into the patrols. All types of action resulted. One track knocked out motorcycle riders as they came up, accounting for five at one position. Another crew got a German lieutenant colonel on reconnais-

sance in an American jeep. Others fired on advance foot troops. In the four-day period the Battery suffered its heaviest casualties, losing in wounded and missing about 20% of its strength.

The remaining half-tracks of the battalion were distributed two per battery and used as the close defense of bridges. Most of the missions assigned the battalion with the XII Corps were bridge defenses. The half-tracks made an excellent weapon in this rôle. One or two were used with each platoon depending on the situation. Normally, the bridge mission was assigned before the area was cleared entirely and while some ground fire was likely. The half-tracks would go in close to the bridge and wipe out any remaining resistance in the way of snipers or machine guns.

On 15 September 1944 when Nancy was captured, Corps Antiaircraft was called to get a platoon on bridges to protect the Engineers on bridge construction. A platoon of A Battery was rushed in during the afternoon and taken to the canal front where the bridges had been blown. The Engineers arrived shortly thereafter, and when construction was started, it was found there were still snipers in buildings on the east bank of the canal. Both A Battery half-tracks had been placed with the platoon brought in, and were able to do some excellent work in neutralizing ground fire. A few bursts from the quadruple .50's directed at any source of small-arms fire very quickly eliminated the trouble.

When the Third Army drive was resumed on 8 November 1944, D Battery was given the mission of sending two platoons with the Engineers, who were to build bridges

over the Seille river for the 80th Infantry Division and 6th Armored Division to cross, and start the southern prong of the eventual Metz envelopment. These platoons went in with the Engineers before the Infantry had cleared the crossings. One crossing at Clemery was giving trouble. When the platoon of D Battery arrived, small-arms and machine-gun fire from a ridge on the far bank had caused casualties. The half-track had been pulled into the open near the bridge site and a 40mm gun was on a nearby slope. The 40 opened on the machine gun emplacement using some small trees near by to secure bursts. The half-track sprayed the ridge from which the small-arms fire was coming. In a short time both fires ceased. The two weapons make an excellent team and can be used to supplement each other. A little later in the morning, the battalion Commanding Officer, in talking to one of the Engineer Lieutenants received this comment: "After our experience here this morning, I've taken back all the bad things I ever said about the antiaircraft."

It is my opinion that the combination of half-track and Bofors has proved successful. Sixteen half-tracks permit flexibility in the employment of a Bofors battalion not possible without them, without losing the advantage of the 40mm gun. No serious maintenance problems have developed, and I consider my battalion better suited to set up a variable defense than either the Self-Propelled or the straight Bofors unit. On bridges particularly, the half-track used with the Bofors gives a defense that is superior to that set up with either weapon alone.



## Bad News for Japs

For the first time in the history of sea warfare, British aircraft operating from carriers can now take off carrying mines. The significance of this disclosure can only be assessed against the background of the Pacific war. It means that carrier-borne aircraft will be able to carry out widespread mining operations in the heart of the Japanese trade routes against an enemy whose depleted shipping resources are already its greatest problem.—*Britain.*

(Continued from page 13)

at our disposal. The only solution was the installation of new heating coils. Therefore, distilled water became a necessity and the engineers set up a distillation plant to furnish 1,500 gallons of distilled water per day to the smoke generators. It was found that, by blowing steam with a very small amount of oil through the coils for a minute about once each hour, any sediment present would be blown out and the coils would be kept clean and operating with a high thermal efficiency as long as distilled water was used.

#### PERSONNEL PROBLEMS

Noncommissioned officers had to be developed with sufficient initiative and skill to control sections of the smoke line. These men rapidly developed the necessary technical skill and by culling out those who lacked leadership, a very high quality noncommissioned officer was developed in the chemical companies. The men from each three generators lived together, keeping one man at each generator at all times. One noncommissioned officer, one mechanic, six operators, and one "handy" man were found adequate to operate three generators. These small groups worked together as a team. When a team had stayed on the line for a period of three or four days or at most a week, another team would be sent out to operate that section, bringing in the spent team for a two- or three-day rest period where they had an opportunity to get a bath, get well fed, read their mail, and otherwise recuperate. To this end a special effort was made to provide an excellent mess and dayroom facilities with such recreation as was available for the men serving the smoke generator. The men on the anti-aircraft smoke line slept during the daytime and were given a big feed about four o'clock in the afternoon, after which they went to their posts and kept their mechanical generators warmed up ready for action throughout the night. The men improved their positions by digging individual foxholes of high quality with overhead cover in the vicinity of their generators and by increasing the protection around each generator during lulls in the firing. In this way most of the generators soon became banked with boxes filled with sand and reinforced with stones, sandbags, iron bars, and other debris. In time each generator position became a miniature fort which required a direct hit from an air bomb or shell in order to damage the generator.

#### REACTION OF THE TROOPS

As the efficacy of the smoke screen increased, a general feeling of security developed among the personnel serving the area. As this feeling of confidence increased the amount of supplies unloaded per day increased until a maximum of 5,875 tons went ashore one day. The smoke screen was not the sole cause of the success of this operation, of course, but it did contribute materially to the comparatively safe landing of reinforcements and supplies, which enabled General Clark to build up a force and supply it under direct German artillery fire which finally was able to break out of its bonds, smash the German lines and take Rome.

#### LESSONS LEARNED ABOUT SMOKE

In summary we might check off the lessons learned in this operation about the use of smoke, viz:

1. In defense of a port or other vital installation from

enemy air attack, smoke blankets from mechanical generator units and smoke pots have proven to be efficient in reducing the effect of enemy air attack.

2. Smoke units should remain under the technical command of the Army Chemical Officer, but should be under the operational orders of the anti-aircraft or coastal defense commander. Close liaison must be maintained by the Army Chemical Officer, the Army Anti-aircraft Officer, the anti-aircraft commander concerned, as well as the other troops in the area who might be affected by the smoke. Smoke must be controlled and all troops must adjust their activities to the long continued presence of smoke.

3. In establishing a smoke screen to prevent observed enemy fire, a band of haze between the target and the enemy O.P. should be maintained only in sufficient density to prevent observation. This allows the units in the area to move freely and to carry out their ordinary work.

4. Careful and continual study must be made of the terrain, the weather, movement of smoke clouds and all other factors which influence the correct technical use of smoke to accomplish the screening mission with the minimum amount of munitions and the minimum interference with other activities.

5. Mechanical smoke generator installations must be supplemented by smoke pot installations so arranged as to continue the production of smoke should the mechanical generator be knocked out, as well as to protect the mechanical smoke generator emplacement from observed enemy fire and to supplement the volume of smoke required to accomplish the mission when atmospheric conditions are extremely unfavorable.

6. Smoke pot installations must be built so that the flare of the burning smoke pot is not observable from the air or from the enemy location on the ground. This can be accomplished by the construction of suitable hovels or by burning the smoke pots in cut banks so arranged that the smoke comes to the surface through large well constructed chimneys.

7. Mechanical smoke generators must be well dug in so as to protect them from shell and bomb fragments. In addition, adequate arrangement must be made for the quick and effective supply of spare parts, their installation, and the replacement of generators that are demolished beyond repair. Also, a continuous supply of new generators and large quantities of spare parts are needed during a campaign.

8. Mechanical smoke generators must be supplied with distilled water if they are to operate over long periods of time.

9. Coordination must be effected between the layout of smoke pot generating installations and mechanical smoke generator installations so that a large area may be covered in the shortest possible time in case of an air raid.

#### GERMAN MISCALCULATION

The Germans boasted to us on the radio that Anzio was the best run prison camp under the control of the Reich because the personnel there could not get off and at best was only self-supplying and could never land sufficient supplies to fight. They guessed wrong that time because smoke got in their eyes.

# Soviet Artillery in Battle

By Colonel N. Nikoforov, Red Army

Artillery plays a most prominent rôle in modern warfare. Embodying as it does the army's fire power it has to a large extent been the decisive factor in determining the issue of battles and operations. Artillery has played a great part in the victories of the Red Army over the Germans. There is a good reason for the popularity of this formidable arm among the Soviet people.

Soviet artillerymen who have shown their high skill in the present war are continuing and multiplying the fighting traditions of Russia's military forces. Russian artillery has long held the place of honor in the armed forces and has been famed for its excellent fire control and heavy fire power.

Ivan the Terrible, who lived in the late 16th Century, even then had artillery which was powerful for his times, and which played a large part in the Kazan campaign. Shortly before that time a "Cannoneers Department" was organized in the Russian army and the cannoneers were separated from the musketeers.

Peter the First paid great attention to the artillery arm. He equipped it with the best cannon and shaped it into a well-knit organization which the Prussian King Frederick II copied from the Russians a half-century later. Peter's reforms resulted in Russian artillery becoming the most advanced in Europe. It remained the best. Half a century later, the newest Russian cannon, known in those days as "unicorns," smashed Frederick II's Prussian infantry and followed that up by repelling the assault of Seydlitz's Prussian cavalry. That decided the issue of the battle of Kunnersdorf.

Russian artillery covered itself with glory also in the War against Napoleon, in the defense of Sevastopol in 1854-55, and in the First World War.

Russian artillery made particularly great strides after the October Revolution. It has since grown to unprecedented proportion due to the fact that Soviet industry, developed in the period of Stalin's Five-Year Plans, has been able to produce the best guns in the world and supply them with ammunition in quantities commensurate with the scope of modern war.

Already at the beginning of the present war the Red Army was equipped with the most up-to-date types of artillery. During the war appeared the 1942 model of the 76mm ZIS-3 gun, which has become the terror of German tanks. There also appeared heavier antitank guns whose shells penetrate not only the *Panther* and *Tiger* but also the newest German *Royal Tiger* tank.

The strength of the Soviet artillery lies not only in first-class matériel. The powerful guns are manned by experts. Soviet artillerymen are selflessly devoted to their country and have mastered their job to perfection.

On 15 May 1942, when 120 German tanks attacked

a Russian artillery regiment, the main blow was directed against the battery commanded by Senior Lieutenant Tkachev. Thirty-five tanks headed for its four guns. The artillerymen, led by Lieutenant Kwash, destroyed eight of the German tanks. The Fascists repeated the attack with double the number of tanks. They succeeded in putting four guns out of action at a cost of seventeen tanks. The same day another battery of the same regiment, commanded by Senior Lieutenant Bykov, had to contend with the main forces of a German tank division. The battery destroyed twenty-seven tanks. The commander died at his guns, but the Germans did not pass.

Toward evening the German tank division which had started out with 200 tanks fell back after losing half its strength, and conceding its impotence in the fight against twenty-four Soviet guns.

Even in the early days of the war German tank formations met with powerful fire opposition and sustained heavy losses. In the latter part of September, 1941, the German tank army fighting west of Bryansk lost over 500 tanks. It was forced to fall back and wait for replacements. General Kleist's tank divisions were routed at Rostov. General Guderian's tank forces were smashed up at Tula, Kashino and Stalingrad.

Soviet artillery played a major part in the historic Battle of Stalingrad. Its action assumed truly stupendous proportions in the operation which led to the encirclement and annihilation of the German Stalingrad Army Group. In some sectors of the front were massed as many as 200-300 barrels per kilometer. On the very first day of the offensive, 19 November 1942, Soviet artillery destroyed and silenced 100 artillery batteries and sixty mortar batteries, demolished 196 dugouts and 126 concrete pillboxes, and wiped out about 9,000 Germans.

Artillery has proved to be the most reliable weapon against tanks. Pincer movements painstakingly planned by the Fascist strategists were smashed by Soviet artillery. We need but mention by way of illustration that in the Orel-Kursk operation in the summer of 1943 Soviet artillery destroyed 1,539 German tanks in three days of fighting.

In the recent fighting west of Siuliai the Germans threw in large forces of heavy tanks. About five tank divisions took part in the enemy's offensive. The powerful fire of Soviet artillery inflicted upon the enemy irreparable losses in manpower and equipment. General Strelbitsky's artillerymen destroyed over 400 German tanks and armored guns in a few days. As a result the enemy's counteroffensive against Siuliai failed.

But victory in the contest against German tanks is but a part of the services which Soviet artillery has rendered in the present war. It has rendered service as effective in the contest against German infantry, artillery and mortars and in blasting the enemy's fortifications. The enemy

immense casualties are largely the result of the action of Soviet artillerymen whose fire attacks play havoc with the German forces.

Success on the offensive depends on whether the attacker will succeed in beating down his adversary's defense and in silencing his artillery pieces, mortars, machine guns, and Tommy guns at crucial moments in the battle. Only effective massed artillery and mortar fire can cope with this mission. It destroys the enemy's manpower or at least forces them to hug the ground. It reduces the strongest fortifications and sweeps away all obstacles. By a rolling barrage artillery and mortars protect friendly attacking tanks and infantry from the enemy's fire and foil his counterattacks.

A feature of every offensive operation of the Red Army is massing artillery resources on the sector where the breakthrough is to be made. Since the beginning of the war, the saturation of Soviet units with various artillery weapons has greatly increased. Whereas in the early stages of the war the density of artillery per kilometer was counted in scores, in offensive operations in 1944 it has become the rule for 200 and more guns to be concentrated on one kilometer of the break-through front. In the Jassy-Kishinev operation 224 artillery pieces and heavy mortars were in action at every kilometer of the main thrust by Soviet troops of the Third Ukrainian Army. That mass of artillery was so organized that its action was distinguished by high efficiency and flexibility.

Questions of the artillery offensive have been studied in the Red Army with unprecedented thoroughness. The artillery offensive consists of artillery and mortars constantly supporting their infantry and tanks by effective massed fire during the entire period of the offensive. Artillery and mortar fire clears the way for infantry and tanks from one enemy strong point to another until the adversary's defenses are breached to their entire depth.

The missions of artillery vary in different periods of the offensive engagement. Accordingly the artillery offensive is divided into three periods: preparation for the attack, support for the attack, and protecting infantry and tank action in the depths of the enemy's defenses.

Artillery preparation is organized to accord with the specific features of the enemy's defenses, but in all offensive engagements artillery preparation is characterized by the combination of action of batteries in concealed positions with the action of guns moved up for firing over open sights. Close-range fire over open sights overwhelms the adversary's fortifications and barriers are blasted at a rapid rate with small expenditure of ammunition, because there is less dispersal. The number of guns used for firing over open sights is sometimes quite considerable. For example, in the attack on German positions on Mount Sapun near Sevastopol, 256 guns were employed for firing over open sights on a front of six kilometers.

When the enemy's defenses are breached masses of Soviet tanks rush into the depths of the enemy's positions. They also must have artillery support and in such cases artillery must be extremely mobile so as not to fall behind the tanks and motorized infantry. Soviet artillery has learned to act with the necessary speed in such cases. During mobile operations in the summer and autumn of 1944 Soviet artillery units at times covered as many as 250-300 kilometers in eight to ten hours, surprising the Germans by meeting their tanks with deadly point-blank fire and thereby foiling all the plans of the German command for counterattacks.

In this war the artillerymen of the Red Army have become hardened in battle and have acquired great fighting experience. Artillery has time and again come forward as the decisive force on which depends the outcome of the battle.



# The CPX-Night Drill

By Captain George S. Prugh, Jr., Coast Artillery Corps

One of the important training exercises presented at Harbor Defense units is the night drill. In most harbor defenses a definite night is set aside each week during which this necessary training is conducted. The principle benefits are, of course, the training of observers and accustoming them to tracking targets by use of searchlights; the same for gun pointers; and the training of searchlight operators to illuminate the targets correctly.

Unfortunately this night drill often bogs down, through a repetitious routine. There are only so many combinations and maneuvers for targets possible, and often over a period of many months it is discovered that all hands lose interest in the drill. The gun crews do not enter into their work with enthusiasm and the echelons of command have long since regarded the drill as "just another function." Under these conditions it is desirable to incorporate the CPX with the night drill, as far as possible within the time allowed, to test *all* battle functions of the command.

Of course the CPX, too, can and unfortunately sometimes does fall into routine. This paper is written to suggest ways of making the CPX night drill of greater interest to all who participate, including the maximum number of officers and men in the harbor defense.

Build the hypothetical problem by which you hope to test technical abilities of the crews, the tactical leadership of command echelons, and the effectiveness of the intelligence network around the target-boat assignments so that as far as possible all lights and all batteries will have a target for each drill; that targets will be changed during drill; and that the battery will have a different course to track each time.

Excellent use may be made of an overlay known as the "situation sketch," described by Captain Aleck F. MacDonald, CAC, in an article in the January-February 1944 issue of the *JOURNAL*. We have borrowed these sketches, used them, and found them excellent for CPX-night drill. They are opened at definite times by observers to provide the picture of a real enemy target had an action actually taken place. Of course, the target boats are being used, so it isn't necessary to use the sketch to show course and speed of the target. But we can, by using the symbols Captain MacDonald describes, show the action of the target respecting firing, sinking, laying smoke and burning. And we can show the results of our fire by sketching the overs, shorts, and hits. We can add to these sketches by cutting out a silhouette of the desired hypothetical target and placing it on the sketch. The observer then has as much information as he would have in a night action, and he can give some clue to the identity of, if not positively identify, the target. A word of caution here. Do not "time" the messages that indicate the fall of shots, but rather note that these sketch messages will be opened after the first salvo or some succeeding salvo is on the way. This will safeguard against a

target being hypothetically fired upon before the battery has actually begun its gun drill.

To give your gun commanders an exercise at some point in the drill have the BC open a message which tells he no longer has communications with his guns. He then fail to answer all calls to the BC station and send information from it. See what the executive and the gun commanders do, how they control their own fire (with or without the emergency methods?) based on the situation sketched and presented to them.

It is possible to check the gun commanders by use of recorded data and a replot. Plot the target's course by the normal position-finding method. Record the gun commander's range estimate, time of estimate, the deflection allowed, the fire adjustment he used (based on sketches and messages), and other data necessary to coordinate your replot and data. This makes a good game that will interest the gun crew and gun commanders, as well as pay the dividends in the study of his emergency methods. It helps to give every man in the crew a crack at this; he might have to shoulder the load sometime.

Cause casualties to be sustained by the crews and see what the gun commander does with his remaining men to carry out his mission. Occasionally throw in a message which will show a malfunction of a piece, such as too little recoil, jammed breechblock, difficult traversing or elevating, etc., and have an umpire or section chief note what the men think is wrong and what they intend to do to locate the trouble and correct it.

Give malfunction problems to radio and telephone operators and to observers. A little imagination in creating problems can test the practical working knowledge of these men and cause difficulties approaching the "real thing" for the BC.

To give the BC's tactical problems, occasionally release them from Battalion control to direct their own fire, selecting proper targets and using the correct fire control procedures. The selection of base-end stations and detection units can be a problem when certain ones are "destroyed" or communications fail or jamming takes place. If a threat by enemy landing forces or saboteurs develops the command echelons must exercise their judgment in weighing and giving priority to their problems so as to carry out their assigned missions.

The local intelligence and command radio networks can be confused, or at least an attempt can be made to do so, by using jamming techniques and "quisling" messages. This ought to test your radio operators in overcoming difficulties to be expected in the event of a real action.

Draw a map of your area so as to resemble a Japanese or German made plan of attack on your installations. Size and designation of units should be expressed in the enemy symbols. Give the map to a man in a lower echelon, etc.

aining that it is to represent a map taken from a captured enemy. See what is done with and about the map.

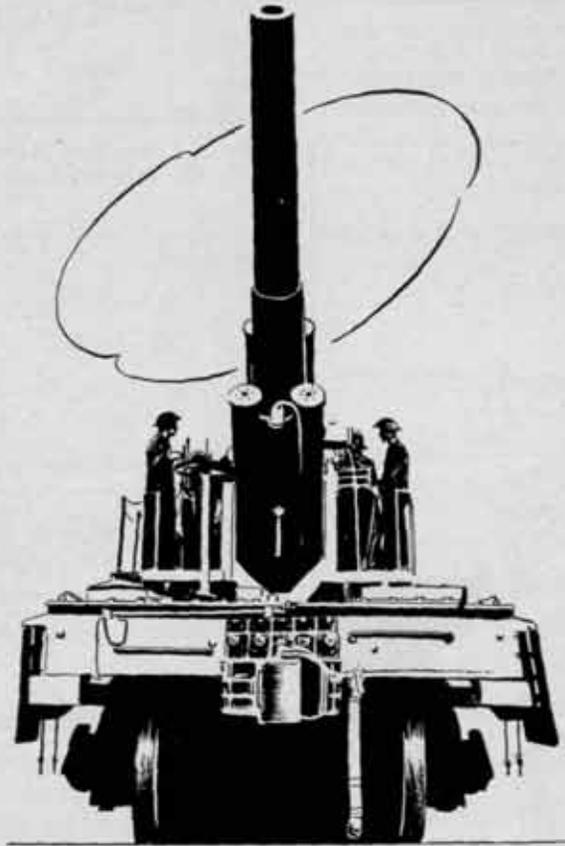
Fires, panic in town, desertions, unexpected appearances of enemy vessels and troops, parachutists, destruction of command posts, cooperation with friendly naval and air task forces, "zoot-suiter" riots, all are fair game for incorporation with the CPX-night drill.

It is generally good to include the administrative elements of the command in the drill. MP's, infirmary, decontamination units, and fire department should be used if possible.

Your own imagination can dream up far better problems

than these, but the above hints might suggest a few new ones for you.

Remember to plan the problem well in advance, knowing the disposition of the target boats, creating the situation sketches and messages necessary to fulfill the problem right down to the lowest and smallest unit. This means careful, intelligent, arduous work on the part of the director. Follow this up with good and adequate umpiring, and you will find that the night drill has become a paying proposition, a close imitation of a real night action, one in which you can locate errors, analyze mistakes, and correct them.







General Kreuger's Sixth Army was driving south from Lingayen on 11 January, meeting light resistance—but a stiffer fight was expected.

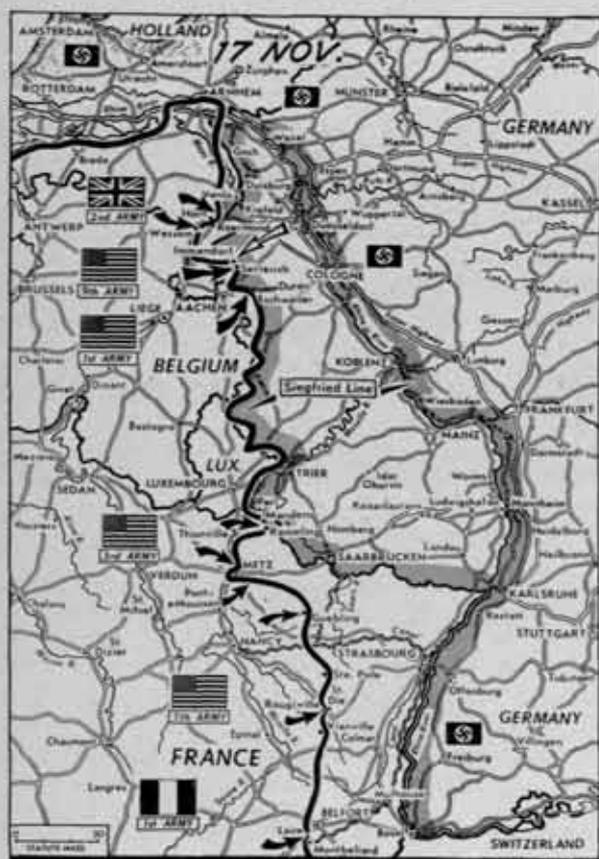


The Burma area, out of the headlines for a while, created a stir on 11 January, with the British holding Shwebo, storming Budalin. Indian troops occupied Ponnagayun, driving toward Akyab. Chinese were pressing toward Wanting. A bulletin from Myitkyina on 15 January stated: "Chinese troops today captured Namkhan, last remaining major Japanese stronghold in North Burma. Only the Japanese garrison at Wanting in China near the Burma border separates the route of the new Ledo Road to China from a junction with the old Burma Road. Another element of Chinese troops from Burma also pushed up the valley north of the Shweli River today and made contact with a Chinese force pushing each from China."



The year's progress in the Pacific may be followed on the map. The Japs lost in Burma, gained in China, and moved back in the Pacific.

# European Theater



The front on 17 November. Arrows indicate Allied drives. The British were approaching Roermond; the Ninth was checking a German counterattack at Immendorf.



On 10 December, the American First Army was pushing on of Aachen; the Third was beating off heavy counterattacks across the Saar in the Dillingen area. Heavy line is approximate battlefront. Coblenz and Bingen were hit by 1,150 Allied planes.



The first major German offensive since Normandy hit the First and Ninth Army fronts at seven points on 17 December. Penetrations were made in Belgium and Luxembourg. American forces broke up a German assault on Mariaweyer. Shaded area is approximate front.



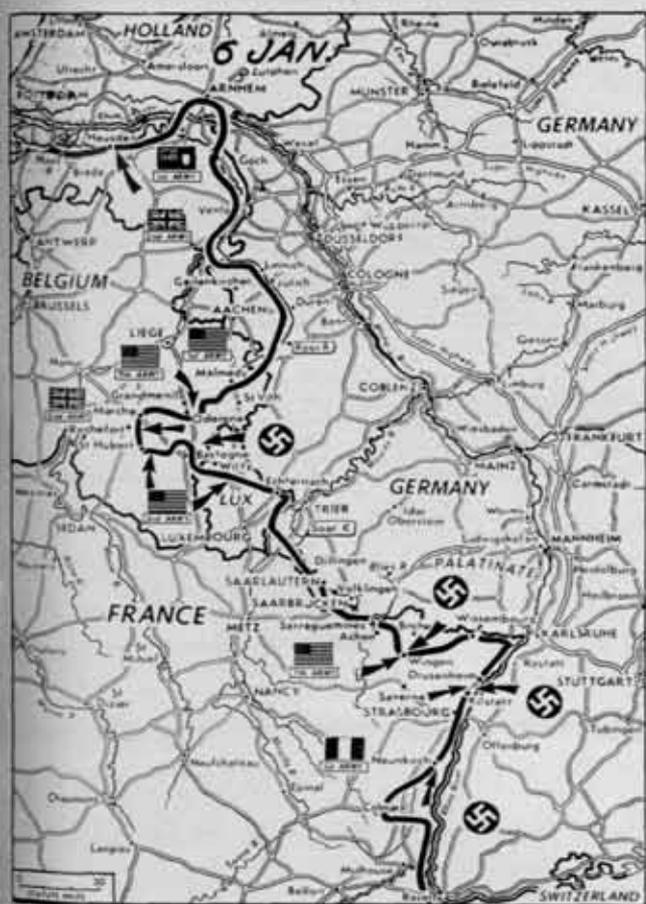
By 22 December the German penetration into Belgium had been blunted, but a new attack toward Thionville was under way. Counterattacking Americans south of Monschau and Rocherath. Shaded line was the front at the start of the German offensive.



The German drive looked like this on 24 December. Bastogne was encircled, but not captured.



German forces (shaded arrows) were counterattacking the Third Army's drives to cut the salient in the Bastogne area, which garrison had been relieved after an epic stand. Black territory is that retaken by the First and Third Armies after the German advance reached its peak.



On 6 January British or Canadian troops had crossed the Meuse at Heusden to take prisoners. At the Belgian salient the Allies took Odeigne; German counterattacks were gaining at the Western end of the salient, and Northeast of Bastogne. The Americans gained in Luxembourg. In the South the Americans were trying to stop the enemy at Wingen, to erase a German bridgehead near Kilstett, and to eject the Germans who had entered Neukirch.



Arrows show Allied drives against the German salient on 11 January. Shaded area indicates farthest German penetration. The Germans were retreating from the Western tip of the salient. The First Army took Houffalize 15 January.

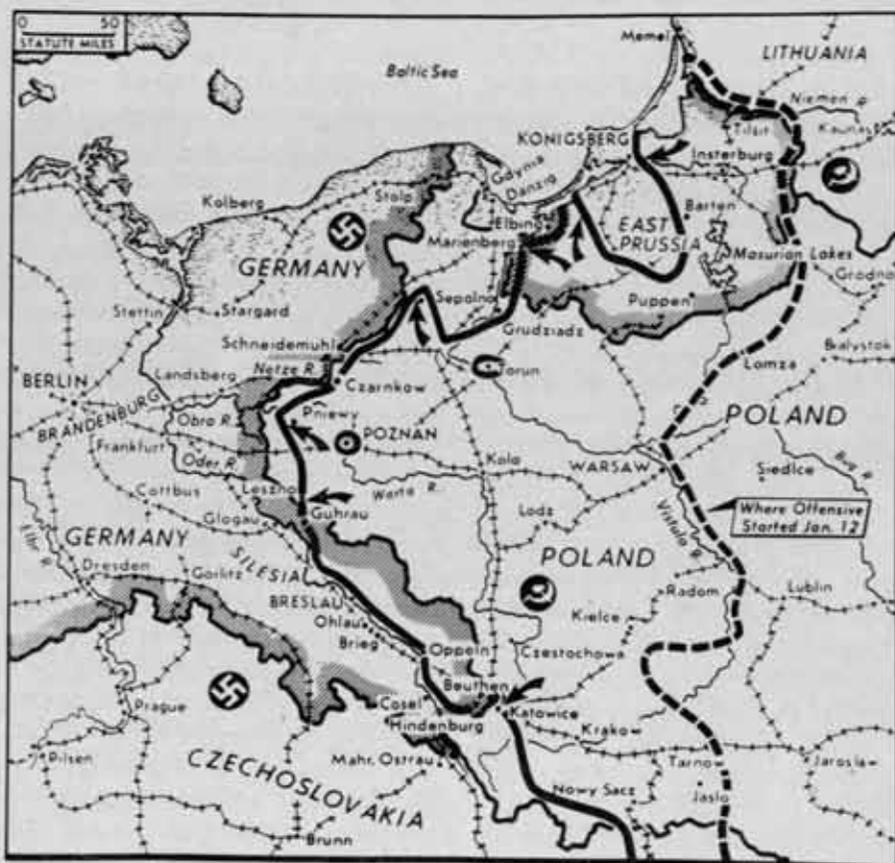
## Italian Front

On 17 December the British Eighth captured Faenza, on the Highway to Bologna. There was heavy fighting at Tossignano.



The three fronts looked like this 22 December. As the JOURNAL went to press (15 January), important Russian drives were developing in the East, progress on the Italian front was still slow but steady against stubborn opposition, and on the Western front the German salient was being reduced and no new serious threats to progress were apparent.

# Last-Minute Maps



Arrows indicate the Red Army drives 29 January on the Eastern Front (heavy line). The Russians were 109 miles from Berlin at Pniewy, west of encircled Poznan. To the East Torun had been encircled, and to the North pressure was continued on East Prussia, where 200,000 Germans have been reported trapped. In the South the Germans had lost vital industrial centers in Silesia. The magnificent advance of the Russians is sufficient answer to the critics who accused the Russians of not pulling their weight in recent months. An offensive of the magnitude of the present advance requires much time and labor to prepare, especially when communications have to be built up and matériel accumulated to follow through.



As of 28 January, the advancing Americans on Luzon have captured Rosario in the North, while the southern drive has taken Clark Field. The heavy line shows the approximate limits of the American advance on that date.

# Let's Get Acquainted

By Lieutenant Colonel Roland W. Boughton, Coast Artillery Corps

Antiaircraft artillery is not organic to larger ground force units; hence to both commanders and staffs of such large units, it is often a strange animal. They know that it is supposed to shoot at airplanes, but they do not know how to turn its special capabilities to their own needs. Any military force is a team made up of parts, each of which has a rôle to fill in the combined effort. No such larger unit can hope to fight effectively if the staff of its commander cannot plan for the full utilization of the special capabilities of its component parts.

The key to success in proper use of antiaircraft artillery is for this staff to make full use of the services and special training of the antiaircraft officer. This should perhaps be stated conversely—the antiaircraft officer of a higher unit should see to it that the rest of the staff gets maximum benefit from his special training and experience. In most cases the antiaircraft officer will not be a permanent member of the staff. Hence, he will not be a familiar personality with whom the rest of the staff is accustomed to working. It becomes doubly important, therefore, that he become a working part of this staff. To accomplish this, the antiaircraft officer must endeavor to set up a reciprocal relationship with each other staff officer—a trading of help and advice. Until the others get to know him and work with him as a matter of course, he may have to inject himself and his business in on their consciousness. He must be co-operative, ready and willing to give his advice to them, and quick to respond to their advice to him.

At first he may have to spend most of his time in the tents of the general staff, to insure that his unit is incorporated quickly into the larger unit, both tactically and administratively. He must see to it that the commander and staff understand just why his unit is there, and just what it can and cannot do. He may have to be a salesman until they are "sold" on having antiaircraft artillery as a part of their fighting team.

Training literature does not take up in detail the antiaircraft officer's staff duties and relationships. The purpose of this article is to fill this gap by discussing these matters in detail, to the end that the antiaircraft officer may not remain the forgotten man of the staff. The infantry division, a typical example of all such large units, will be used as a basis for this discussion.

## THE COMMANDER

It is absolutely essential that the antiaircraft officer inspire his commander with *confidence* in him—both as a trustworthy staff officer and as a capable commander upon whom he can depend in all situations. There will often be no opportunity to engender this relationship by serving together over a long period of time. Therefore it is important that the antiaircraft officer create a good initial impression on his commander. This first sizing up will probably be the cornerstone of future relationships between the two. Upon

it will rest the commander's confidence in his plans and recommendations and in his ability to make his unit a well integrated and smoothly functioning part of the higher command. Upon the antiaircraft officer's shoulders rests the success or failure of his unit as a supporting arm.

With respect to his commander, the antiaircraft officer is an expert on the employment of a special arm. The commander may not know much about the use of this new and relatively unfamiliar arm except in a general way. If the antiaircraft officer can complete his education in this respect. He can tell his commander just what the attached unit or units can or cannot do. He can clear up any misconceptions the commander may have on the use of the arm. In particular situations, the antiaircraft officer can help his commander reach a decision as to how the antiaircraft artillery can best fit into the over-all plan. Based on his relatively thorough knowledge of the enemy air situation, capabilities, and current tactics, he can give his commander an estimate of the air situation which will often be of distinct value in completing the latter's over-all estimate. He can state whether or not the present attachments of antiaircraft artillery can provide effective defense for the troops and installations of the unit. If his answer to the question is "No," he can tell the commander the amount and type of additional antiaircraft artillery means which should be requested from higher headquarters. From his knowledge of the enemy air situation and current tactics, he can give expert advice on what troops and installations of the supported force offer the most remunerative targets to enemy air attack. From detailed studies of current trends in selection of objectives by enemy air forces he can make an educated guess as to what installations within the unit are more likely to be attacked. This will be valuable in making a final decision on priorities in case the commander has a hard time deciding on the relative importance of two or more objectives. The antiaircraft officer, knowing whether or not he can exert effective centralized control over antiaircraft artillery units during an operation, can and should make recommendations as to what attachments, if any, should be made to other subordinate commanders.

One very important matter in the relationship between an antiaircraft officer and his commander is the nature and type of instructions given to the former as commander of antiaircraft artillery troops. Since no larger unit ever has enough antiaircraft artillery to provide effective defense for *all* troops and installations, it follows that some selection must always be made. This *decision as to priorities*, although perhaps preceded by recommendations from the antiaircraft officer, is always the prerogative of the higher commander; he is the one who is finally responsible for the security of his entire force. The actual utilization of the available antiaircraft artillery means, however, is best accomplished by the antiaircraft officer. He is the expert in

this matter. Therefore, the higher commander should tell the antiaircraft officer *what* to protect, but not *how* to protect it. In other words, orders to the antiaircraft officer as a subordinate commander should always include a statement of *priorities* for antiaircraft defense. Except for this element, however, such orders should give the subordinate as free a hand as possible in carrying out his mission except for necessary restrictions to insure coordination of effort. The normal type of order to antiaircraft artillery units states only the priorities for defense. Here again appears the importance of the commander's opinion of the antiaircraft officer as a staff officer and as a leader. The latter should fight to retain centralized control and a free hand in executing his mission unless distance, lack of communication or a vague situation make effective centralized control impracticable.

There is one other important matter in the relationship of an antiaircraft officer to his commander—the assignment of ground fire. Antiaircraft artillery possesses great capabilities for use in several auxiliary rôles, including fire against tanks, fire on pillboxes or other fortifications, or firing as field artillery. But the provocation should be very great before antiaircraft artillery is shifted to ground fire. It is designed basically for a very special job of bringing down aircraft. Normally it should not be otherwise used unless the air threat has ceased to exist, or unless some ground fire rôle assumes greater importance and the higher commander has exhausted other normal means. Should this problem arise, the antiaircraft officer can be of great help to his commander in solving it. Changing antiaircraft artillery to its auxiliary rôle as a first priority must of course be a *command decision*. The antiaircraft officer can advise his commander on whether or not it is worth the risk to forego defense against the air threat. If the latter decides to use antiaircraft artillery in terrestrial fire, his assistant can give him expert advice on how to get the best use out of it.

### G-3

The relationship of the antiaircraft officer to G-3 coincides on many matters with his relationship to the commander himself. As G-3 implements his commander's decisions by preparing detailed tactical plans and orders, he can obtain much help and advice on the tactical employment of a relatively unfamiliar arm. Conversely, the antiaircraft officer can do much to prevent the misuse of antiaircraft artillery in any such developed tactical plan or order. He should see to it that he has constant and effective liaison with G-3. As G-3 develops his tactical plans abreast of and ahead of the situation, the antiaircraft officer should keep pace with recommendations for employment of the antiaircraft artillery in such plans. Only through such close and continuous relations can full and continuous defense against the air threat be maintained. Hence the antiaircraft officer should establish his command post in the immediate vicinity of that of the higher unit. He must spend a large part of his time in the tents of the general staff, particularly that of G-3. Direct command and supervision of the antiaircraft artillery units should be accomplished by the antiaircraft officer in between times or passed on by him to his executive. The key to successful and effective use of antiaircraft artillery is the avoidance of "compartmentation" in

staff work; the antiaircraft officer must be both *mentally* and *physically* adjacent to the other staff sections of the higher unit.

One specific matter in which G-3 and the antiaircraft officer are particularly concerned is the coordination of all active and passive means of air defense. Here G-3 can call upon the antiaircraft officer as an expert to develop and coordinate this very important *Antiaircraft Defense Plan*. It includes not only instructions on active defense to be provided by antiaircraft artillery, but also active and passive defense instructions to *all* troops of the larger unit. These measures include: instructions from higher headquarters (including restrictions of fire and recognition procedures) on air-antiaircraft coordination; rules on firing at enemy aircraft by small arms and other weapons; restrictions of fire and recognition procedures for protection of friendly aircraft; special measures of camouflage, concealment, and dispersion as necessitated by the current air situation; instructions on defense against airborne attack; and special secrecy measures to avoid detection from the air and to reduce casualties. The bulk of such a plan will be SOP; parts of it will include special or temporary instructions necessitated by the current situation. The antiaircraft officer has special training and means available to develop this plan in detail. He can also be of great value in special training of troops and in supervising the execution of the plan when it has been approved and is in effect.

With respect to G-3's general planning on tactical matters, it is necessary that the antiaircraft officer furnish certain tactical and logistical data concerning his unit. G-3 knows a lot about the organic units of the force, but he is likely to be unfamiliar with the characteristics of antiaircraft artillery units. The antiaircraft officer can furnish him information such as:

- (1) Capabilities—the number and size of areas which can be protected, the nature and extent of protection which can be provided for both stationary and moving units, conditions in which effectiveness of defense is cut down or eliminated;
- (2) Road priorities necessary to permit antiaircraft artillery to furnish protection during movements;
- (3) Rates of march and time-lengths of column for antiaircraft artillery units;
- (4) Number and types of vehicles in units;
- (5) Number of vehicles available for other uses, and conditions under which these vehicles can be spared; and
- (6) Attachments if any of antiaircraft artillery to other units in specific situations.

G-3 can also call upon the antiaircraft officer to prepare the sub-paragraph of field orders which contains missions and instructions to antiaircraft artillery units.

### G-2

Although the antiaircraft officer's relationship with G-2 may not be so large and varied as it is with G-3, nevertheless the former can make valuable contributions to G-2's work. Speaking generally, the antiaircraft officer can be a valuable source of information on the enemy air situation and current tactics, and an expert adviser on reaching an estimate of enemy air capabilities in any situation. Through liaison with air force channels of dissemination and through

his own AAAIS, he constitutes a readymade source of continuous information which G-2 can tap. As an expert in estimating enemy air capabilities, the antiaircraft officer can estimate: extent and effectiveness of aerial observation; numbers and types of enemy aircraft within operational range; type and scale of air attacks to be expected; amount and type of protection provided by friendly air force elements; which troops and installations are most likely to be subjected to attack; nature and extent of damage to be expected; and amount of interference with successful accomplishment of our mission from enemy air action.

G-2 has another constant headache in which the antiaircraft officer can help out—the *counterintelligence plan*. In this matter the latter can tell G-2 what types of troop concentrations, movements, and other activities can be observed from the air. He can recommend the nature and type of passive air defense measures necessary to avoid aerial observation—both SOP measures and special restrictions required by specific situations. He can differentiate between effective avoidance of observation by day and by night. In secrecy restrictions on active defense, too, the antiaircraft officer can give expert advice—when and under what conditions troops should or should not fire at enemy aircraft. He can recommend the nature and type of assistance which G-2 might request from supporting air force units in the area in order to prevent effective enemy aerial observation. In training of troops in passive defense measures and in supervising the execution of the provisions of the counterintelligence plan the antiaircraft officer can also be of assistance. The engineer officer is of course the expert on technical means of using camouflage, but in active operations he will probably be much too busy to supervise passive air defense measures in detail. In this case the antiaircraft officer can very well fill in and perform this important function.

#### G-1 AND G-4

In his staff relationships with G-1 and G-4 the functions of the antiaircraft officer are for the most part limited to those matters which have to do with planning for personnel, administrative and logistical support of attached antiaircraft artillery units. But the importance of these matters, particularly supply and maintenance for his troops and weapons, cannot be stressed too strongly. Unless the antiaircraft officer early makes friends with G-4 and his cohorts, and makes the administrative needs of his unit known, his troops will be without food and his weapons and equipment will be useless because of empty ammunition belts, empty gasoline tanks and lack of spare parts. The antiaircraft officer, upon attachment of his unit to the higher command, should be prepared to furnish G-1 with: authorized and actual strength of his unit; needs for replacements (by specialist serial numbers); and expected rates of losses in active operations. He should be prepared to furnish G-4 with:

(1) Requirements of supply and maintenance peculiar to the attached antiaircraft artillery units, including amounts and types of special ammunition used by their weapons; units of fire for the various weapons; and rates of expenditure to be expected in different types of operations.

(2) Logistical characteristics of antiaircraft artillery units attached—amount and types of equipment and supplies constituting their basic loads, amount and types of administrative personnel and transportation, and amount of administrative transportation available for loan and what such transportation can be spared.

In addition to furnishing the above information concerning his units, the antiaircraft officer can give G-4 much help in the latter's plans for security of administrative troops and installations from air attacks. He can recommend special passive measures of concealment, cover, dispersion and convoy discipline, and active measures to make full use of the organic weapons of service troops. He can supervise the execution of such plans by the service troops concerned. He can keep G-4 informed as to which of his administrative installations need antiaircraft artillery protection. Furthermore, he must maintain liaison with G-1 and G-4 in order that his plans for antiaircraft artillery protection of administrative installations may be kept abreast of the changes in location and movements of these installations.

#### THE SPECIAL STAFF

In addition to his staff relationships with the general staff in their plans affecting the higher unit as a whole, the antiaircraft officer has direct dealings with various special staff officers on specific matters.

With respect to the artillery officer, the antiaircraft officer will have two principal matters to discuss: furnishing of antiaircraft artillery protection to field artillery units (such times as AAA is assigned this mission), and advance plans for using antiaircraft artillery in a field artillery role when required. In either case there must be close liaison and detailed coordination of plans. The antiaircraft officer must familiarize himself thoroughly with the organization and characteristics of the field artillery units, and their tactics and technique. He must know the size and characteristics of field artillery units when considered as targets for enemy air attack. He must be familiar with the manner in which field artillery units displace in support of other arms. Coordination of planning must insure that antiaircraft artillery units are effectively tied into the signal communications plan of the field artillery, in order that the one may maintain effective and continuous protection of the other in moving situations. Plans for movements must be coordinated so that traffic conflicts may be avoided and so that field artillery may receive protection in movement as well as in position. For effective use of antiaircraft artillery rôle all of the above coordination must of course be maintained. In addition, special arrangements must be made to bring the firing capabilities of antiaircraft artillery under the efficient control of the fire direction center.

The signal officer also has much of common interest with the antiaircraft officer. When an antiaircraft artillery unit is attached to a higher command it is the responsibility of the signal officer to establish channels of signal communication to the command post of the attached unit. The antiaircraft officer should familiarize himself with special adaptations within the higher unit of the normal method of installing and operating signal communications, and obtain a copy of the current Signal Operating Instructions.

early as possible. In addition to normal relationship with commanders of attached units in signal matters, the signal officer has an important special interest in the antiaircraft officer in connection with his own planning for warning systems. The latter brings with him an important addition to the warning means already present in the larger unit—the AAAIS (Antiaircraft Artillery Intelligence Service). This element is the antiaircraft artillery's own means of providing itself with warning of the approach of enemy aircraft. It should be tied into the larger unit's own warning system as soon as possible. The antiaircraft officer should tell the signal officer precisely what warning means he has in his unit, describe accurately its characteristics, capabilities, and normal system of operation, and how to get the greatest benefit out of this warning service. By conferring, the two can arrive at plans which will make the most efficient use of the AAAIS and which will insure that it is effectively tied into the over-all warning system.

To the antitank officer (when such is designated) the antiaircraft officer brings an important and highly effective addition to the antitank means of the higher unit. Normally, of course, the antiaircraft artillery will be employed on its primary mission. Even so it is a valuable adjunct to the unit as a whole in case of a tank threat; the weapons may fire either from their antiaircraft positions or from alternate positions occupied on order when the tank threat develops. Coordination of planning between the antitank officer and the antiaircraft officer should insure that the antimechanized capabilities of the antiaircraft artillery is utilized to the utmost consistent with performance of its primary mission. The antiaircraft officer should tell the antitank officer the number, type, and caliber of the weapons in his unit, their capabilities and limitations in bringing fire to bear on moving terrestrial targets, and their muzzle velocity, rate of fire, effective range, effectiveness of fire control, and penetration characteristics. The antitank officer in his turn can give the antiaircraft officer instructions on measures for concealment and for obtaining mutual support, on special techniques of assigning targets and directing fire against tanks, and on selection and assignment of positions and fields of fire for the antiaircraft artillery units. These two officers must insure through coordination of plans that the full antimechanized capabilities of the antiaircraft artillery are effectively combined into the integrated over-all plan for antitank defense of the larger unit without interfering with effective performance of its primary mission.

The engineer officer and the antiaircraft officer have community of interest on one principal matter—the utilization of camouflage to obtain concealment from aerial observation. The latter is specially qualified in the general matter of coordination of all active and passive measures for air defense; the former is an expert in the specific matter of utilization of natural and artificial measures of camouflage.

These two staff officers should coordinate in planning for air defense to the end that the finished plan will have made full use of the special qualifications of each. The antiaircraft officer, then, should plan for and supervise the over-all air defense plan; the engineer officer should function as a technical expert on specific camouflage measures. As regards antiaircraft artillery units themselves the engineer officer can help the antiaircraft officer in the specially difficult problem of camouflage for antiaircraft artillery positions.

Relationships between the ordnance officer and the antiaircraft officer revolve mainly around the problem of special supply and maintenance requirements of antiaircraft artillery units. In order to insure proper ordnance support for his units the antiaircraft officer should provide the ordnance officer as early as possible with information on: types of special ammunition used by his weapon; unit of fire for each weapon; expected rates of expenditure of ammunition in different types of operation; special types of ordnance maintenance and salvage necessary; and types of special ordnance maintenance units under higher headquarters whose services may be required for antiaircraft artillery units. The ordnance officer in his turn should orient the antiaircraft officer on the existing system of ordnance supply and maintenance in the higher unit, and experience on special maintenance techniques necessary under local conditions.

There are no special problems of coordination between the antiaircraft officer and the quartermaster and surgeon. These latter two should of course acquaint the antiaircraft officer with existing procedures of quartermaster supply and medical evacuation, in order that the antiaircraft artillery units receive full support of these services. The antiaircraft officer can help the others with advice on active and passive air defense measures for their troops and installations.

The preceding paragraphs outline in general terms the matters which require coordination between the antiaircraft officer and various other staff officers of any large ground force unit. There are of course other problems which will arise in particular situations and which cannot always be foreseen in advance. The contents of this article, however, might furnish a basic check list of those *normal* matters in which other staff officers have common interest with the antiaircraft officer. But if nothing else were said on the subject at all, this one truth must be emphasized: It is absolutely essential that full, complete cooperation and teamwork exist between the antiaircraft officer and the rest of the staff—from the first moment that an antiaircraft artillery unit is attached. Failure to obtain this teamwork courts disaster for vital elements from enemy air attack; effective use of the antiaircraft officer is one of the keys to success for the force as a whole. The antiaircraft officer must strive to the limit of his ability to establish this cooperation as early in the game as possible.



# WEISSIGHT TRAINING AIDS

By Lieutenant Oliver J. Bryan, Coast Artillery Corps

The problem of simplifying methods of teaching the Computing Sight M7 and M7A1 (Weissight) is presenting itself to officers and noncommissioned officers in 40mm automatic weapons units.

The complete theoretical solution of the gunnery problem by the Weissight will not be taught to the average gun crew. However, questions will arise which can be answered completely only by introducing the basic fundamentals of the theory of the sight.

The following paragraphs contain several suggestions and training aids developed by the AAATC Ordnance School, Camp Hulén, Texas, to help the individual instructor clarify his presentation of the Weissight to a class.

In order to present an interesting class on nomenclature of the Weissight, the instructor may choose to bring the sight into the classroom. An excellent method for displaying the Weissight to advantage during this phase of instruction is to construct a stand, about three feet in height, upon which the sight can be mounted. Constructed of scrap lumber and mounted on casters, the stand is a portable unit which can be turned to allow the instructor to name the various parts of the sight as he discusses them. The stand should be equipped with a bracket to hold the azimuth gear box drive assembly, as well as a support to hold the limit switch plate of the gun. The main support is mounted on the stand by means of four bolts, and the complete Weissight unit can thus be demonstrated to the class.

The method of maintaining the levels of the deflection indicator assembly is often confusing to a class. In order to show clearly how the assembly remains level through all angles of elevation of the gun, a simple training aid can be constructed. Also built of small pieces of scrap wood, this aid has proved invaluable for demonstrating the effects of variable and constant errors on the level of the deflection indicator assembly. The aid is constructed so that points ABCD, in figure 1, form a parallelogram. The class can now be shown that through the action of this parallelogram connection to the gun, the indicator arrow will remain level for any gun movement. By adjusting the lower end of the super-elevation link (line AD in figure 1) farther from or nearer to point B, which represents the gun trun-

nion center, the effect of variable error in the level of the deflection indicator arrow is shown, i.e., the arrow will change from an upward tilt to a downward tilt through a 90° change in elevation of the gun. If desired, a more elaborate aid can be built to include the super-elevation link pivot assembly at point A, for the computing sight M7, and at point D for the computing sight M7A1.

Before the student goes to the firing point, he should be instructed in the basic fundamentals of the Weissight problem. To answer the question "How does the Weissight compute lead?" the instructor should first provide himself with some method of actually showing his class what the Weissight is computing during a course.

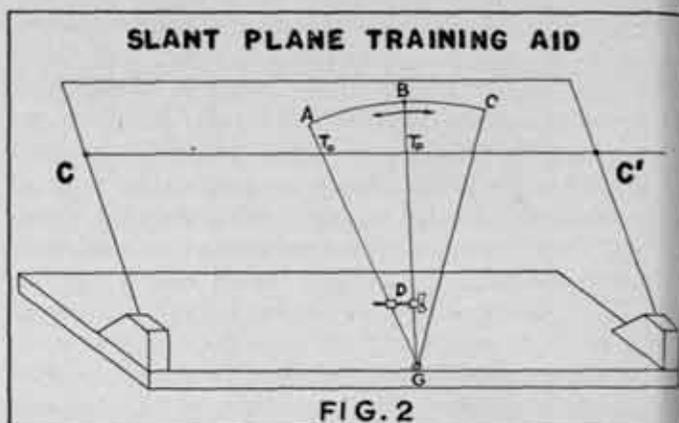
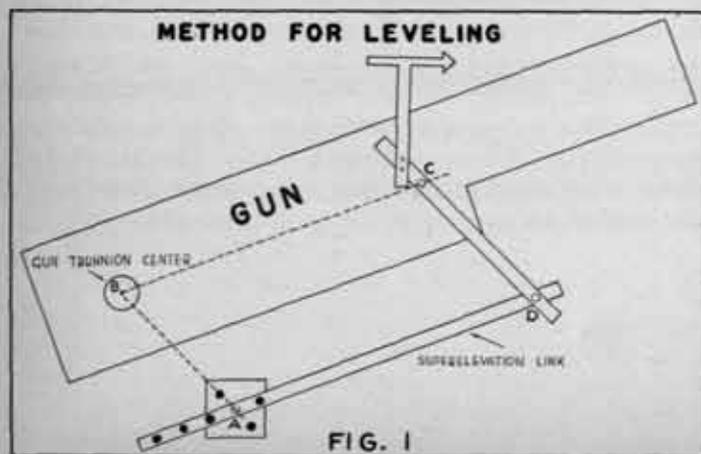
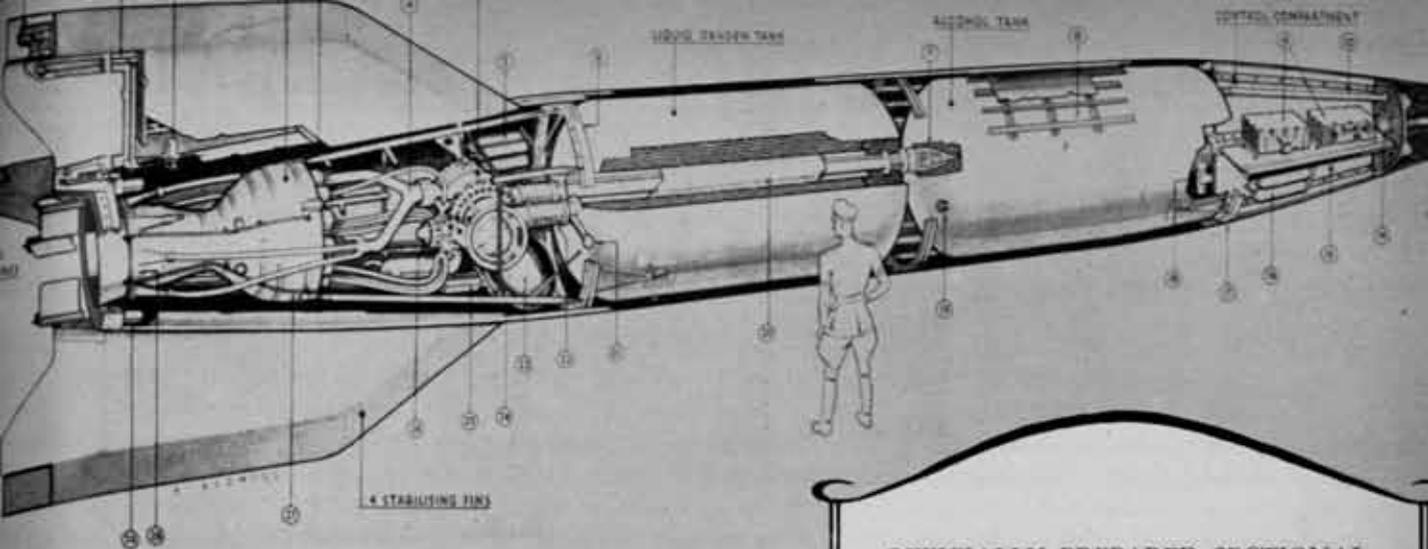


Figure 2 is a sketch of a training aid now being used by the AAATC Ordnance School at Camp Hulén. The aid is extremely useful because it contains all the essential elements of an actual Weissight course. Constructed entirely of wire and mounted on a wooden base, this training aid can be adjusted so that the line C-C; the course of the target, can show diving, climbing, or constant altitude courses. The line gun-A represents the line of sight to the present position of the target. The line gun-B is the bore of the gun, neglecting super-elevation. The entire arc ABC and the gun position represent the slant plane of the Weissight, controlled by the position of the deflection indicator arrow. The line of sight and the axis-of-bore line are painted in contrasting colors to define them clearly. The wire rectangle is the slant plane containing the gun, the present position of the target, and the future position of the target. The thumbscrew, D, will represent a composite lead screw and indicator arrow. The lead angle in the training aid can thus be regulated by the thumbscrew.

The importance of aligning the arrow parallel to the target's course can be readily shown by comparing the Weissight slant plane to the slant plane of the target's course. Subsequent displacement of the head of the arrow toward the operator or away from the operator will demonstrate the sensings of high and low shots, and will be a guide to proper rules for fire adjustment for the Weissight.

NOTE: All nomenclature used in this article conforms with Computing Sight M7 and M7A1 SNL F-276.





OFFICIALLY PREPARED SECTIONAL  
DRAWING OF V-2

1. Chain drive to external control vanes.
2. Electric motor.
3. Burner cups.
4. Alcohol supply from pump.
5. Air bottles.
6. Rear joint ring and strong point for transport.
7. Servo-operated alcohol outlet valve.
8. Rocket shell construction.
9. Radio Equipment.
10. Pipe from alcohol tank to warhead.
11. Nose, probably fitted with nose switch or other device for operating warhead fuze.
12. Conduit carrying wires to nose of warhead.
13. Central exploder tube.
14. Electric fuze for warhead.
15. Plywood frame.
16. Nitrogen bottles.
17. Front joint ring and strong point for transport.
18. Pitch and azimuth gyros.
19. Alcohol filling point.
20. Double-walled alcohol delivery pipe to pump.
21. Oxygen filling point.
22. Concertina connections.
23. Hydrogen peroxide tank.
24. Tubular frame holding turbine and pump assembly.
25. Permanganate tank (gas generator unit behind this tank).
26. Oxygen distributor from pump.
27. Alcohol pipes for subsidiary cooling.
28. Alcohol inlet to double wall.
29. Electro-hydraulic servo motors.

# V-2

British Official Photos

↓ Forward end of the jet unit of a V-2 which landed in Belgium.  
V-2 is about forty-six feet long and six feet in diameter at base.



← The RAF-men at the right are lifting a peroxide tank. Liquid air and hydrogen peroxide produce a highly explosive mixture of oxygen and hydrogen, which propels the weapon.

# A British View of the American Soldier

Not the enemy, but lack of petrol, halted the magnificent drive which carried General Patton's army across France to the Moselle and beyond. At the beginning of September American patrols not only penetrated into the formidable fortress of Metz, but drove on past it. The enemy was disorganized and demoralized. He seemed incapable of making a stand and lacked a coordinated central command. If General Patton's tanks had rolled on another fifty miles the battle might well be over. But splendidly as the supply and other auxiliary services behaved in the surprisingly long-sustained drive, the tanks finally outran them and a pause became inevitable.

Today supplies present no difficulties on this front comparable to those provided by the weather. The Third Army's drive across France was a triumph of teamwork by ground and air forces. But not for weeks now has the weather been such as to permit that regular close air support that armor and infantry previously employed, and now, as we move into hostile territory to be as full of venom, hatred, and blows in the dark as the Nazis can contrive, it will be more than ever necessary. Every American soldier in this line is as keen as any Briton at home or oversea for the war to be won quickly; nor is he pessimistic, even now, about the length of hostilities.

## LESSONS LEARNED

The pause has done no harm. On the contrary it will probably mean victory more complete at a smaller cost, and certainly it has enabled valuable lessons—such, for instance, as the dangers of fraternization with the enemy—to be learned. The lull since those stirring days of August has enabled the troops, who worked and fought at a pitch which seldom before can have been experienced, to rest, units to regain their full strength in men and equipment, and stocks of material to be built up in readiness for another push.

Talking recently with the chief of staff of an armored division which has contributed much to the successes gained by the Third Army, I remarked that I supposed his men were enjoying the present relatively quiet time. He replied that they had enjoyed it, but that now they were anxious to get moving again. These combat troops know well what action means, but they want to finish the job. For them the road to Kansas, Detroit, Washington, and Chicago runs through Paris and Berlin.

## LOCAL FIGHTING

It was only relatively a lull. It was marked by constant fierce, local fighting, the foiling of a succession of enemy counter-strokes—at one period supported by substantial armored strength—and the steady improvement of the position held by the Third Army as the Germans have been relentlessly pressed back.

Even now the enemy line is being pushed eastward, especially to the south. Ahead lie the Siegfried Line and the Rhine, and there is not a commander or a man in this

army but feels that both are well within his capabilities. This confidence is solidly based. The American soldier knows his opponent, knows he is no superman, and knows from experience the talk about the "master race" for the balderdash it is.

The Americans have sound reasons on the positive side for sober confidence in their ability to inflict final defeat on the enemy in due course. The first and second of these are to be found in their training and equipment, both of which have been tested in battle and proved excellent. No one who has seen the magnificent equipment of the American forces—seen, for instance, an armored division deploying—could fail to be impressed by the contribution to victory made by American workers on the home front. Included in this equipment today are several new weapons which will be used against the Nazis in due course. One is a new tank destroyer, a vehicle of thirty-one tons capable of a speed of thirty miles an hour and mounting a 90mm gun which fires a 24lb. armor-piercing projectile. This is likely to prove invaluable alike against tanks and fortifications. In practice shoots these weapons have shattered tanks as though they were made of cardboard and the projectile has gone clean through thick reinforced concrete.

## CHANGED MEN

Along with first-rate training and equipment goes the third essential—the will to victory. The basis of this has probably shifted somewhat during the progress of the battle across Europe. As his conversation and letters home have disclosed, the American soldier when he first came to the Continent was to a large extent a curiously non-political person. For the majority this was not a crusade against Fascism, scarcely a crusade at all, probably. Their land had not been occupied, nor even bombed, and they had not experienced the dangers, hardships, and irksomeness of more than five years of modern war. But they knew it was because of the Germans that they were thousands of miles from their loved ones and their normal pursuits, and that only the destruction of the Germans would bring the reward of a return home. So they set about the task of destroying the Germans in earnest.

Today they are changed men. They are no less earnest in their execution of the primary task of destroying the enemy, but they are doing it for more and stronger reasons. They have seen Nazism at first hand and what it means in physical destruction and degradation of the human spirit. They have learned at first hand what it amounts to in cruelty, cheating, and exploitation. They have seen it destroy their comrades. And so, steeled in battle and knowing now more clearly for what they are fighting, they stand ready for the final battles.

To the British regular officer or sergeant-major these steel-helmeted young men in their loose fitting combat jackets, often Churchillian to the point of having a cigar between their lips, might seem undisciplined; but judged by results the American way of active intelligent cooperation by all ranks has certainly achieved great things.

→  
This German 88, captured near Metz, fires on Germans with the same gusto with which it fired on Americans.

# THEIR OWN MEDICINE

→  
The caption says this is a German 20mm Bofors, captured in the Saverne area. From the slight indication of damage, the gun should soon be shooting at its former owners.

Signal Corps Photos



↑ Americans serving a Russian piece, captured from the Germans.

←  
This German field gun, captured near Verdun, is being used by the Americans near Metz.



# The Incredible Patrol

By Corporal Russ Engel

This is the story of a single patrol sent out recently by the 101st Airborne Division. At the time, the 101st was stationed with the British at the Neder Rijn (Lower Rhine), which is the front line of the Allied wedge into southeastern Holland. Five enlisted men and one officer volunteered for the patrol, which they knew would be thoroughly dangerous. As it turned out, it was fully as dangerous as they expected even though only two shots were fired during the twenty-four hours in enemy territory. The day after the six came back I met them at a camp in the rear where they had come for a rest and a bath. They wanted to tell their story and I wanted to write it, so this is how we worked. One of them would talk for a while and when one of the others had something to add he would break in. This way we would be able to pass the story around among the men and get a complete picture of what happened.

M/Sgt. Peter R. Frank, a German-speaking interpreter who is from New York City, began the story. It appeared that a number of patrols from other regiments of the 101st had crossed the Neder Rijn to get information about enemy movements. None of them had been able to take any prisoners for questioning, so Sergeant Frank's regiment wanted to try. By careful planning, they thought, they would be able to do the job right.

At first Lieut. Hugo S. Sims, Jr., the only officer on the patrol, had felt he wouldn't be able to get permission to go along. However, Sims had a lot of ideas about how the patrol should be run, so he was able to talk his commanding officer into letting him go. Sims and the other men worked for two days rehearsing their parts in the patrol. They discussed what to take along and what to leave behind, what weapons they should use, whether or not they should blacken their faces. They talked over things like fixing their hats to look like German caps so their silhouettes would look German in the dark, and what kind of radio equipment they should carry. They studied maps and huge aerial photographs of the places they expected to go. They worked hard and all the men did a lot of talking. Everyone had strong opinions about how to stay alive.

The patrol also meant a lot of work for other men. There were listeners who would wait at the radio for the patrol's reports, artillerymen who would drop shells in case they were needed, men who would shoot off flares from time to time so the patrol could look around in the dark. There were men who would have rubber assault boats ready to paddle across the Rijn and who, if everything went all right, would bring the patrol back across the river.

Before they started out, the men reviewed the objectives of their mission. They were to set up an observation post on the Utrecht-Arnhem highway to watch the movements

of enemy vehicles and troops. They would try to find out if the enemy had a main line of resistance and where it was. They planned to radio back the information as they went along. But their most important mission was to bring back a real, live German for questioning by intelligence officers.

Here Pfc. Frederick J. Becke of Atlantic, Iowa, took over the story. "All of us were a little nervous in the last few hours before the patrol. We all had blacked our faces and we began to look as if we were really going on this deal instead of planning it. I was stuck with one of the musette bags with half the radio in it. One of the other boys wanted to carry the other half and I was a little griped because I was stuck with the heaviest part. But the other boys had their jobs, too. They had demolition blocks for blowing the railroad we planned to cross on the return trip.

## THE PATROL WAS ARMED TO THE TEETH

"Instead of the steel helmets we had been wearing for the last month or two we wore our soft overseas hats. Each of us had our pockets full of extra ammunition plus grenades and honed knives. We were really going prepared. In addition to our regular weapons we all carried .45 pistols. Wilbur was the only one of us taking an M-1 rifle, the rest of us chose the Tommy gun for more firepower. We tried to talk him out of the M-1 but we knew it would be nice to have him along with it. Wilbur has the reputation of being pretty accurate with that gun and is famous for never shooting at a man unless he can aim dead center for the head. He doesn't miss.

"After a dress rehearsal in front of headquarters, where Lieutenant Sims checked over our equipment, we decided we were set. Now it was only a matter of waiting for darkness. We sat around for a while and then went in for some hot chow. The cooks seemed to know what was up and the boys in the mess line gave us a few pats on the back. Lots of our buddies came up and wished us well and said they were sorry they couldn't go along. They really were, too. We all tried to act as if it meant nothing at all. After we washed our mess kits one of the cooks came up and gave each of us three K-ration chocolate bars and said when we came back he'd have a swell hot meal waiting. It was getting dark now and we all sat around the S-2 office getting fidgety."

Here Pvt. Roland J. Wilbur, the M-1 rifle expert, took over. He comes from Lansing, Mich., where he used to work for Nash-Kelvinator. Now he almost looked like a soldier in one of their magazine ads, sitting there with a grim look on his face, cleaning the M-1 as he spoke.

"The S-2 office wasn't too far from the dike on the Neder Rijn. We took off about 7:39. We rechecked all our stuff and piled into two jeeps. In a few minutes we were up near the area where we planned to cross. We stopped and

# Seacoast Methods with the FA Trainer M-3

By Lieutenant Colonel

George C. Vaughan,

Coast Artillery Corps

Some Coast Artillery units have been provided with the Field Artillery Trainer M-3. The trainer has been used for the most part to indoctrinate Battery personnel in the methods of Field Artillery fire control and fire adjustment. While this compressed air miniature battery has proved very successful in its normal rôle, it may prove even more useful in Seacoast training. The trainer is provided with a gunner's quadrant for pointing in elevation, and an M5 panoramic sight for pointing in direction. While this pointing equipment is satisfactory for Field Artillery methods, it is not designed for Seacoast problems, and will be difficult to use in firing at a moving target on a 15-second time interval.

A mount has been designed at the Coast Artillery School to adapt one separate unit from the trainer battery to the 37mm sub-caliber mount of the 155mm gun. When mounted on the 155mm, the normal Seacoast pointing equipment can be used. Horizontal base position-finding may be employed if a miniature base line is established, and proper plotting-room scales and charts may be constructed from the firing tables. When using this system, the daily artillery drills will allow the entire Battery to conduct target practice in miniature, training will be provided for gun pointers, spotters, and adjusters that is lost entirely in normal drill. Maneuvering, incoming and outgoing courses are possible that cannot be obtained with target practice courses. The trainer will provide an excellent means of instructing personnel in Gun Commander's action and other alternate methods of fire control.

An adapter, as illustrated, can be constructed locally to mount the trainer unit on the 155mm gun. A reducer attachment must be employed in connecting the trainer intake valve to the compressor air hose. One trainer unit will represent a two-gun battery in firing, since two shots may be fired in rapid succession to simulate salvos. If it is desired to use additional guns and trainer units, additional lengths of air hose must be obtained.

To secure best results, the air pressure should be kept at a constant 70 lbs. Greater accuracy may be obtained if the gunner will press the firing plunger before loading in order to clear the small air container. The container will leak slightly during each T.I., and this clearing process will provide for refilling just prior to firing, resulting in a more constant firing pressure.

Due to the large parallax angle caused by sight dis-

FIRING TABLES FOR FA. TRAINER M-3  
on 37mm Mount for 155mm Gun-G.P.F.

Scale 1 foot = 100 yds.

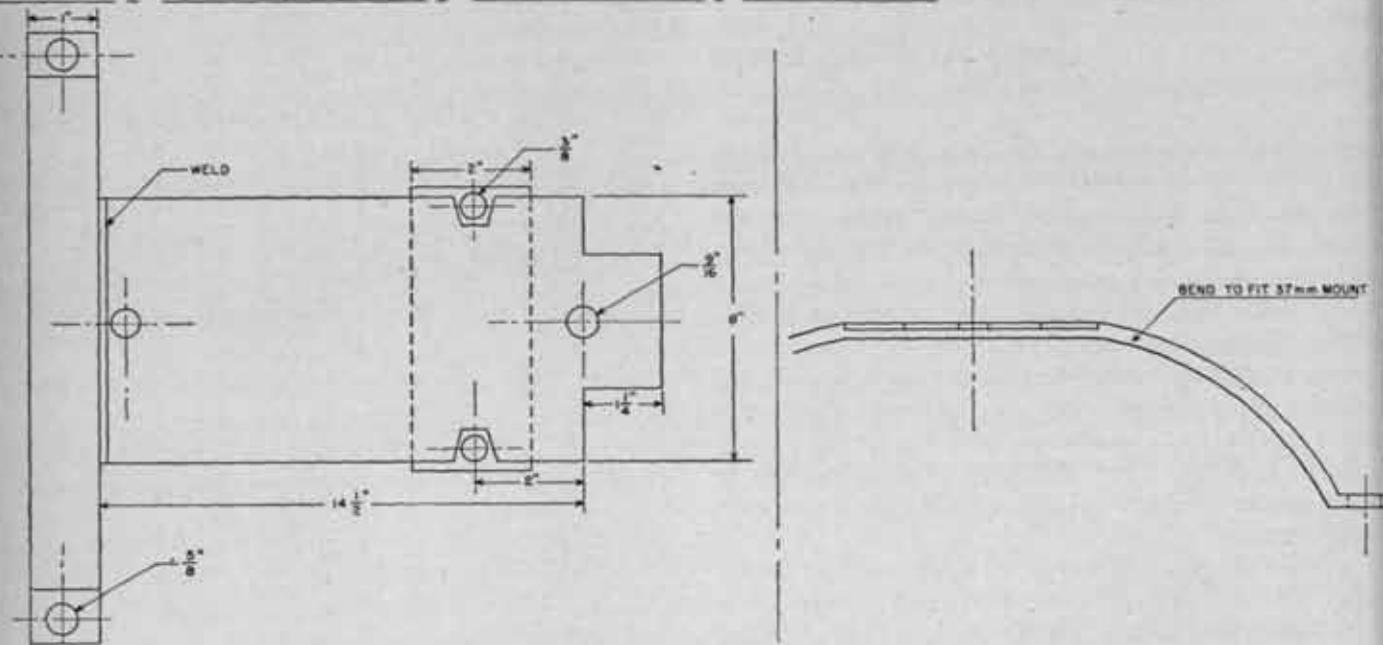
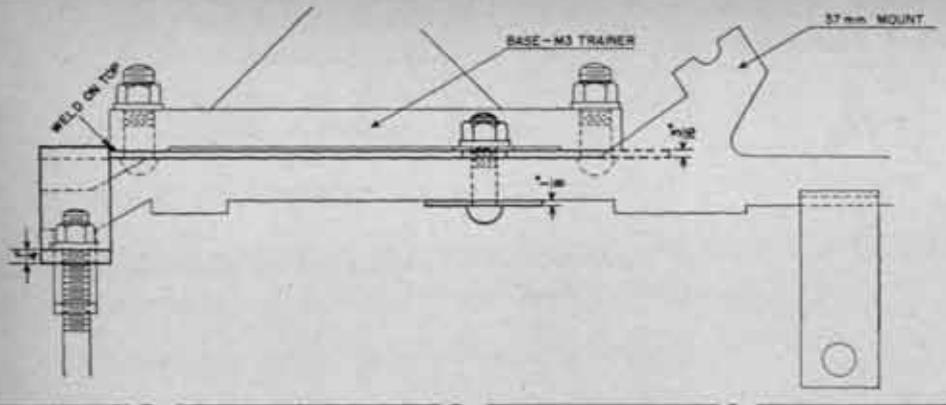
\*Height of Site 6.5 ft. to 8.5 feet

Air Pressure—70 lbs. constant

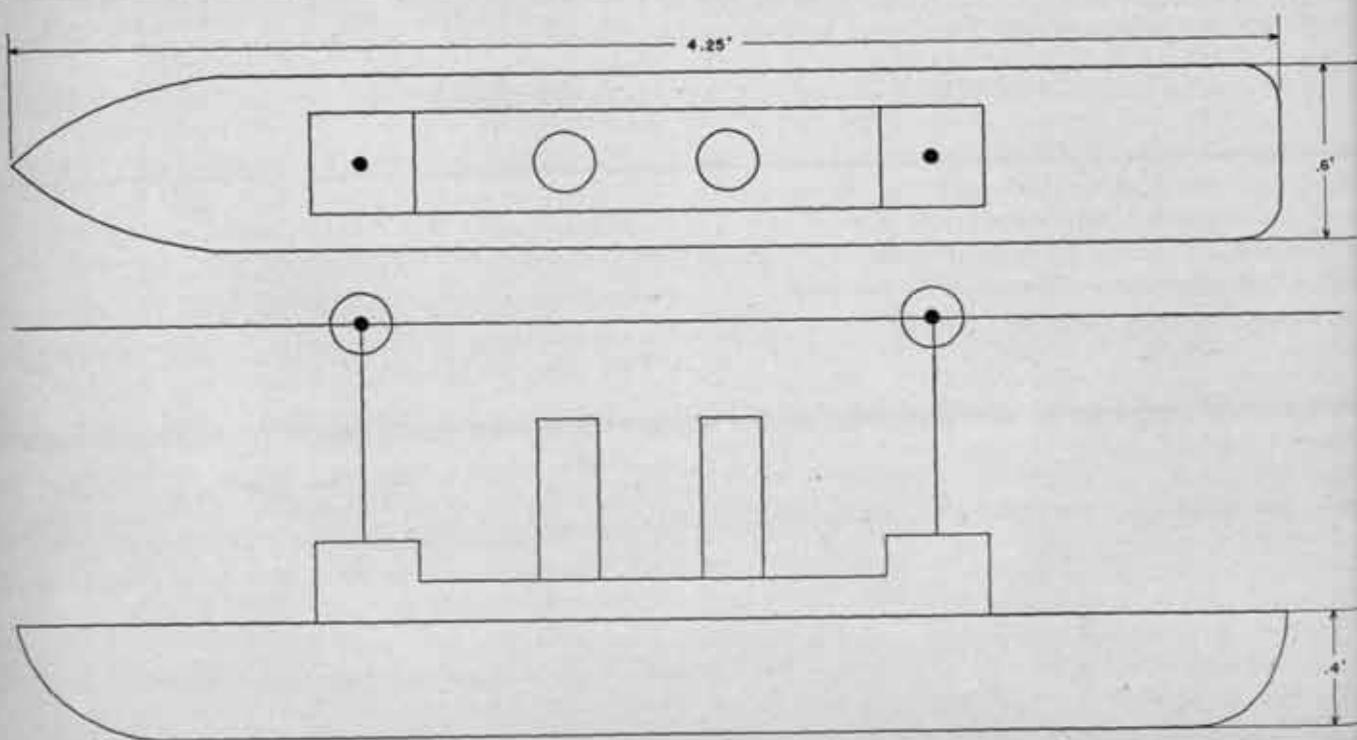
RANGE (yds.)	ELEV. (mils)	C (mils)	T.F. (sec.)	R.P.E. (yds.)	L.P.E. (yds.)	RANGE (yds.)	ELEV. (mils)	C (mils)	T.F. (sec.)	R.P.E. (yds.)	L.P.E. (yds.)
5265	0	3		300	15	12700	257	4			
5300	1	3				12800	261	4			
5400	5	3				12900	265	4			
5500	8	3	.6	210	15	13000	269	4	1.7	75	50
5600	11	3				13100	273	4			
5700	15	3				13200	276	4			
5800	18	3				13300	279	4			
5900	21	3				13400	283	4			
6000	25	3	.7	150	20	13500	287	4	1.8	80	50
6100	29	3				13600	291	4			
6200	32	3				13700	294	4			
6300	35	3				13800	298	4			
6400	38	3				13900	302	4			
6500	42	3	.7	110	20	14000	306	4	1.9	90	55
6600	45	3				14100	309	4			
6700	48	3				14200	313	4			
6800	52	3				14300	317	4			
6900	56	3				14400	321	4			
7000	59	3	.8	85	20	14500	324	4	2.0	95	60
7100	62	3				14600	328	4			
7200	65	3				14700	332	4			
7300	69	3				14800	336	4			
7400	72	3				14900	340	4			
7500	76	3	.9	70	25	15000	344	4	2.1	100	60
7600	79	3				15100	348	4			
7700	82	3				15200	352	4			
7800	86	3				15300	356	4			
7900	90	3				15400	360	4			
8000	93	3	.9	60	25	15500	364	4	2.2	110	60
8100	97	3				15600	368	4			
8200	100	3				15700	372	4			
8300	104	3				15800	376	4			
8400	107	3				15900	380	4			
8500	110	3	1.0	55	30	16000	384	4	2.3	120	65
8600	114	3				16100	388	4			
8700	117	3				16200	392	4			
8800	121	3				16300	396	4			
8900	125	3				16400	401	4			
9000	128	3	1.1	50	30	16500	406	4			
9100	132	3				16600	411	4			
9200	135	3				16700	415	4			
9300	138	3				16800	420	4			
9400	142	3				16900	424	4			
9500	146	3	1.1	50	35	17000	428	4	2.5	130	65
9600	150	3				17100	433	5			
9700	154	3				17200	438	5			
9800	157	3				17300	443	5			
9900	160	3				17400	448	5			
10000	163	3	1.2	50	35	17500	453	5	2.6	140	70
10100	167	3				17600	458	5			
10200	171	3				17700	463	5			
10300	174	3				17800	468	5			
10400	177	3				17900	473	5			
10500	181	3	1.2	55	40	18000	478	6	2.8	150	70
10600	184	3				18100	484	6			
10700	187	3				18200	490	6			
10800	191	3				18300	496	6			
10900	194	3				18400	502	6			
11000	198	3	1.3	60	40	18500	508	6	2.9	160	70
11100	202	3				18600	514	6			
11200	205	3				18700	520	6			
11300	208	3				18800	526	6			
11400	212	3				18900	533	7			
11500	215	3	1.4	60	40	19000	540	7	3.1	170	70
11600	218	3				19100	547	7			
11700	222	3				19200	554	7			
11800	226	3				19300	561	7			
11900	229	3				19400	569	7			
12000	232	3	1.5	65	45	19500	576	7	3.2	180	70
12100	236	3				19600	584	8			
12200	239	3				19700	592	8			
12300	243	3				19800	600	8			
12400	247	3				19900	608	8			
12500	250	3	1.6	70	50	20000	616	8	3.0	185	70
12600	254	3				20100	624	8			

\*Height of Site varies from 6.5' at 0 mil to 8.47' at 600 mils. Range Elevation Tables are corrected for this variable Site.

†Minimum Range.



FA. TRAINER M3 ON 37mm MOUNT, 155mm GUN



MINATURE TARGET FOR M3 TRAINER

placement at the very short ranges, an initial error of considerable magnitude will occur in Case II pointing. This error may be eliminated by either lateral adjustment during firing, or a table may be compiled for each  $.03^\circ$  change in parallax angle with the correction for the particular range applied to the deflection board. This particular error would not be present in Case III firing.

For adjustment of the trainer in elevation and direction, the 155mm should first be adjusted with its own pointing equipment. The trainer is then made to coincide with the 155mm by using the elevation and traversing thumb screws. For elevation adjustment, the gunner's quadrant is used, and for orientation in direction, the tube of the trainer must be removed so that proper alignment may be obtained. Since the lateral problem is not reduced in scale where angular units are concerned, all rules applying to elimination of sight displacement errors should be applied in orienting.

The dimensions shown for the miniature target represents the size of a normal 155 target in range and lateral probable errors, and the scale of construction is that used in the construction of the firing tables. An angular danger space of 42.5 mils is presented by this target when broadside. While this will greatly reduce pointing accuracy, it is necessary because of the relatively large lateral probable error of the trainer.

The M-3 Trainer has several advantages over the .22 and .30 caliber rifles used as sub-caliber in the past by many SC organizations. Very little space is required—an area



200 feet square will suffice—and the ammunition is unlimited in that it may be collected after firing and used again. If the trainer should become an item of standard issue, it will provide a long needed training aid, a simple means of conducting Artillery Drill in which full coordination of all elements of the firing unit is obtained.



## Electronic Gunsight

A new electronic computing gunsight that increases the effective range of the Army Air Forces' .50-caliber machine guns, making it possible for gunners to shoot down the fastest enemy planes with an accuracy approaching that of stationary guns firing at stationary targets, was revealed by Erwin Hale, engineer in charge of airborne fire control instruments of the Fairchild Camera and Instrument Corporation, New York, at the meeting of the Institute of the Aeronautical Sciences, held in Dayton.

The newest of the "electronic brains," designated by the Army as the "K-8" gunsight, was invented jointly by Mr. Hale and Irving Doyle, another Fairchild engineer. It extends the effective range of .50-caliber machine guns mounted on aircraft to more than 1,000 yards. As much as 50% to 90% as many hits have been obtained with the K-8 as when firing at a stationary target from a stationary platform, Mr. Hale reported.

"When it is realized that a pursuit ship must come

within 200 to 400 yards of a bomber in order to score effective hits, it is readily apparent that the K-8 provides a really deadly defense against pursuit attack," Mr. Hale remarked.

Installed in aircraft gun turrets, the K-8's provide the correct deflection between the line of sight and the guns to insure hits on enemy aircraft. It is only necessary for the gunner to keep the ring of light in the sight lined up with the target to set up the correct deflection of the gun to compensate for all factors which affect the course of the bullet in flight and to provide the necessary lead to compensate for the enemy aircraft's relative velocity.

All computations are made electrically, and the final voltage representing the desired offset between the line of sight and the gun is then sent to an electronic servo system, which adjusts the guns to the desired offset.—*Science Service.*



# The JOURNAL NEWSREEL

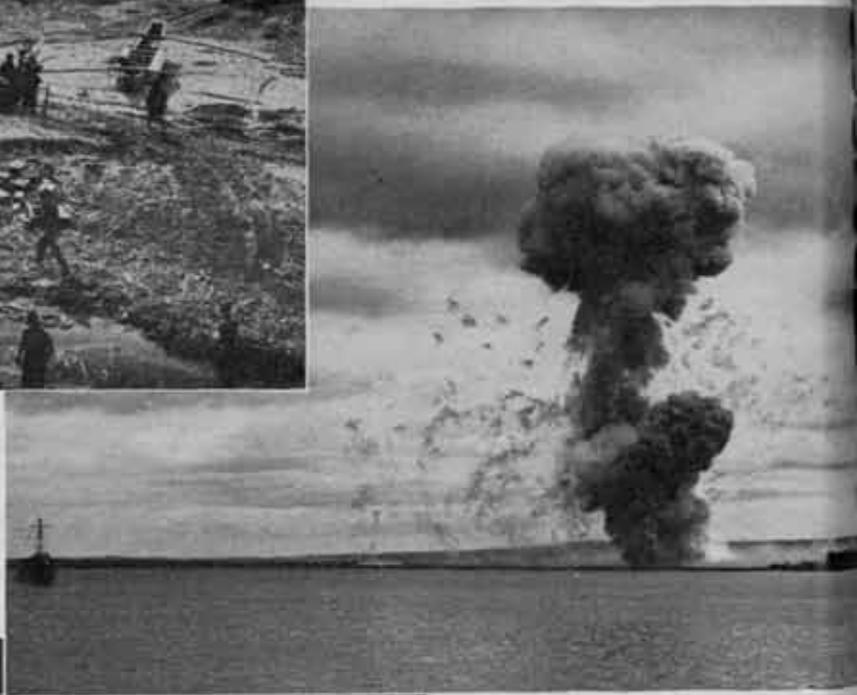


←  
*Leyte.* Happy natives mingle with Americans on the beach. The native canoe seems out of place, considering the mechanized equipment scattered about.

Coast Guard Photo

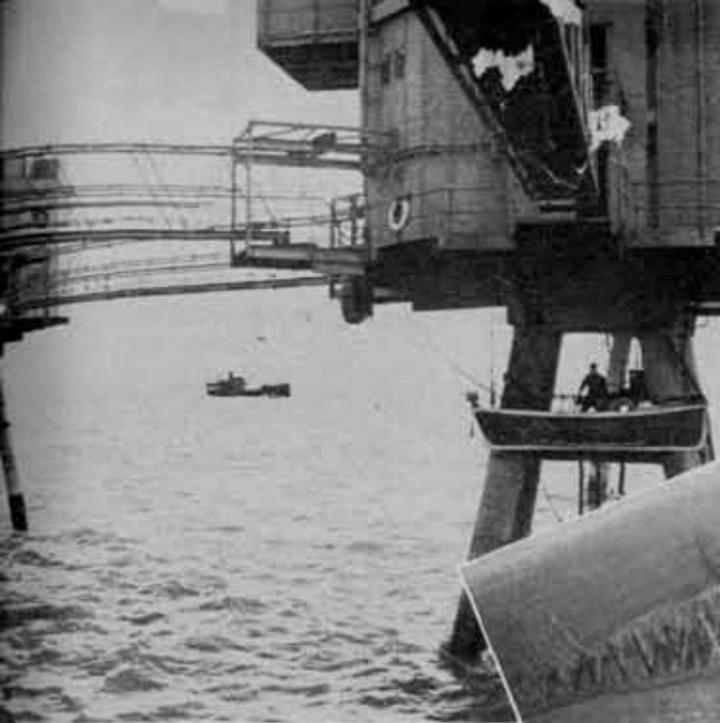
→  
*Cherbourg.* An exploding Allied ammunition dump makes an impressive picture.

Signal Corps Photo



←  
*Paris.* A German radio-controlled glider bomb, of the type released from aircraft, is placed on exhibition.

British Official



↑ *Thames Estuary.* Steel and concrete AA forts defend London from air attack. Communication with the mainland is by boat.  
British Official

↓ *Siegfried Line.* A Ninth Army AAA crew waits for a target. The dragon's-teeth tank barrier in the background is part of the permanent works of the Line.

Signal Corps Photo



← *A British Port.* HMS Graph, the former German U-570, is now in service with the British, after capture by the RAF.  
British Official

→ *Dulag, Leyte.* Americans dig in at Dulag.  
Signal Corps Photo



# Field Artillery Firing on Waterborne Targets

By Major John C. Linderman, Coast Artillery Corps

Field Artillery firing on waterborne targets presents a difficult problem due to the high mobility of targets. It is believed that targets which might come under the fire of Field Artillery units will travel at a speed greatly in excess of 100 or 200 yards a minute. Because of this, some system must be provided wherein the observing interval or dead time does not exceed thirty seconds. Also, it is felt that guns should be fired at a rate of no less than two rounds per gun per minute.

The most suitable Field Artillery instrument for tracking a moving target is the B.C. Telescope M1915A1. However, when this instrument is used in conjunction with the F.A. gun sight for firing Case III or indirect laying, difficulties arise due to the fact that the two instruments do not have identical scales. As the B.C. Scope turns to the right the readings increase whereas when the sight is turned so as to move the gun to the right, the sight readings decrease. Because of this discrepancy some means of changing azimuth readings from the B.C. Scope to deflection corrections for use on the gun sight must be provided. The device described below is suggested as a solution.

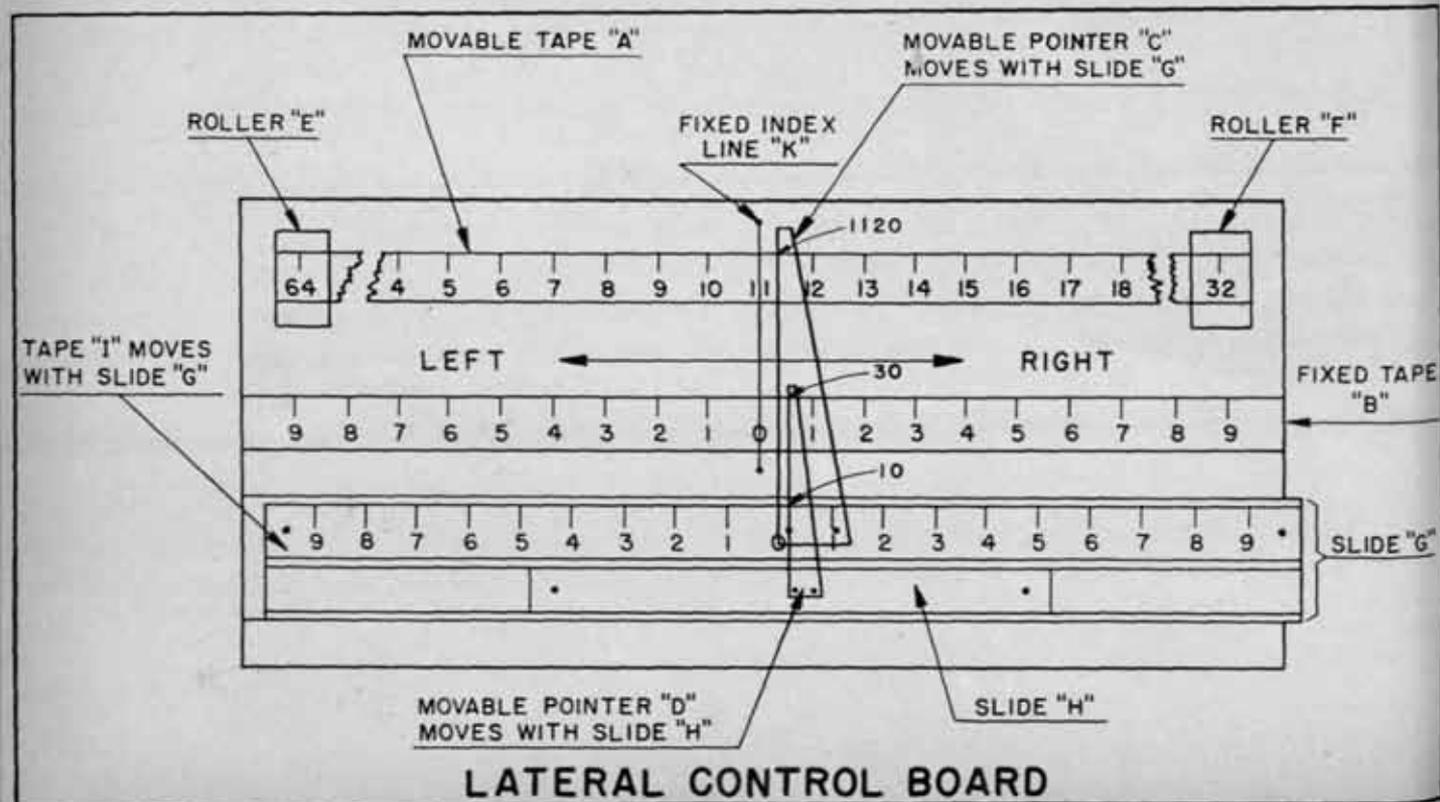
The board is constructed of wood and is approximately three feet long, one foot wide, and six inches deep. All tapes shown in the drawing are to the same scale. Tape "A" is continuous through 6,400 mils while the other two

are graduated as shown. Note that when slide "G" is moved both pointers are displaced since "H" is contained in "G". When "H" is moved, however, only pointer "D" moves.

When the board is in operation the B.C. Telescope must be located in the vicinity of the firing battery so as to provide axial observation. The B.C. Telescope must be oriented to read the same as the sight deflection when both the gun and the telescope are pointed at the directrix, and the sight is laid on the aiming point. In the event that the gun pointer must shift to another aiming point the B.C. Telescope will have to be reoriented so as to determine initial deflection.

Before opening fire, the range to the target is determined either by means of a range finder or by estimation and a corresponding time of flight is determined. The target is tracked during this estimated time to determine approximate lateral travel of the target during the time of flight. This travel is applied on the board by displacing "D" in the proper direction. This is an initial correction.

The target is tracked with the B.C. Telescope and readings are sent to the board operator on each bell or time interval. The operator sets successive readings under the index line "K" by rotating tape "A." As each reading is set under index "K" the pointer "C" is displaced to the new



reading coming from the B.C. Scope. This will offset "C" and "D" from the "O" correction mark on scale "B." The amount of displacement will be the travel of the target during observing intervals and will show up as a deflection correction on Scale "B." The initial travel will be doubled to correct for dead time, or travel during an observing interval. If this correction were not made the guns would fire behind the target by an amount equal to the travel during the observing interval. This is an initial correction and will be done only on the first reading or only once prior to opening fire. After each deflection is sent to the guns, the pointer "D" is returned to zero of pointer "C." Lateral corrections for fall of shots are applied by displacing pointer "D" in the proper direction on scale "I." Deflections should be read to the guns as soon as possible after receiving travel readings to enable the guns to fire on the next bell. Deflections to be sent to the guns will always be read under pointer "D."

#### EXAMPLE

Suppose that the directrix, or center of field of fire, of a battery is 1,600 mils and that the B.C. Scope and gun sights have been oriented to this azimuth. A target is noted coming into the field of fire. Assume an observing interval of twenty seconds. The first reading sent down from the B.C. Scope is 1,100 mils. Since this is 500 mils left of the directrix the operator of the board described above would send to the guns "Left, 500." The operator then sets 1,100 on scale "A" under index "K", as shown in the drawing. The next reading twenty seconds later is 1,120. The operator moves pointer "C" out to 1,120 on scale "A" which would indicate a right 20 correction on scale "B." Meanwhile the target is tracked during estimated time of flight and the target is found to travel 10 mils to the right during this period. Pointer "D" is offset 10 mils to the right on scale "I." Reading the total correction on scale "B" under pointer "D", the operator sends "Right 30" to the guns. The positions of all pointers and tapes at this time are shown in the drawing. The operator then places, 1,120 on tape "A" under index "K." The operator then moves pointer "D" back to the normal on scale "I." The reading to come from the tracker is 1,140. The operator moves pointer "C" to 1,140 on tape "A" and notes that two consecutive readings have shown the same travel indicating that the target has a uniform rate. He doubles the correction of "Right, 20" and sends "Right, 40" to the guns. This compensates for the travel of the target during the twenty second dead time or observing interval. The gun is now ready to fire on the target at the next bell with the above setting on the sight. The gun will be leading the target at that time by an amount equal to travel during time of flight when the gun sight is layed on the aiming point. The tracker continues to send down successive readings to the board operator who sends corresponding travel corrections to the guns.

Assume that the guns fired on the target and the shots were sensed as 10 mils to the right of the target. The board

operator then displaces "D" to "Left, 10" on scale "I." If the travel during the next 20 seconds is still "Right, 20" the total correction to the guns will be "Right, 10". The operator then moves "D" back to normal on scale "I" and proceeds as before.

#### RANGE

The preceding paragraphs have dealt with the problems of lateral tracking and corrections only. Range determination and adjustment may be done by means of a self contained range finder or may follow the methods of Central Control.

Central Control is briefly an alternate method of fire control and adjustment requiring a minimum of fire control instruments. Range determination and adjustment are accomplished by an estimation of the range to the target and corrections that are subsequently based on the fall of shots. Adjustment is carried on so that the probable limits of range are constantly narrowed until hits are produced.

This system should be as flexible as possible and requires intensive training of personnel for any contingency that may arise. A high rate of fire is a big asset because it makes for rapid adjustment. Spotting is by far the greatest single factor contributing to the success or failure of this system. Without accurate range spotting the difficulty of the problem is greatly increased. Since spotting is done from a single axial station it will first be necessary to adjust laterally before accurate range sensings can be determined.

The initial range to the target is estimated and the guns fired at an elevation corresponding to this range. The next salvo is fired at a range of 500 yards greater or less than the initial range depending upon whether the target is on an outgoing or an incoming course. The next salvo is fired at a range of 500 yards from the initial range and in the opposite direction from the second salvo. This gives a range area of search of 1,000 yards. If the target is not crossed in the initial 1,000 yard bracket consecutive range changes of a 1,000 yards are made until a bracket is obtained. When a 1,000 yd. bracket has been obtained it will be split. Smaller brackets will also be split until hits or straddles are obtained. If at any time following hits or straddles three consecutive rounds are in the same sense a range change should be made to the upper or lower limit of the last bracket depending upon the direction of sensings of the shots. If at any time it can be seen that the fall of shots has drifted considerably away from the target bold range changes of 500 yards should be made to reestablish a bracket which will be split as before. Two or more hits or straddles should establish a rate of range change which should be followed until proven wrong.

The use of graph paper should simplify the problems of the adjuster since he can plot the fall of shots in relation to the target. With experienced men very good results have been obtained with this system. With training of observers ranges of 6,000 to 8,000 yards can be estimated to within 500 yards, thus making for more rapid adjustment.



# Orientation Data for Trial Shot Problems

By Lieutenant Colonel Everett D. Light, Coast Artillery Corps

This is a solution for selecting the azimuth within a given field of fire at which to fire a trial shot problem, in order that the T angle will be the maximum for any selected horizontal range. Inspection of the figure reveals that all triangles are solved by means of simple trigonometric relations, saving time and reducing the probability of errors occurring in the more complex solution of oblique triangles using the law of cosines.

The construction is made as follows on a sheet of rectangular coordinate paper:

Construct the base line to any convenient scale along a vertical axis near the left edge of the paper. Label the ends of the base line  $O_1$  and  $O_2$  in their proper relation to one another depending upon whether  $O_2$  is on the left or right of  $O_1$  when facing the field of fire.

Through  $O_1$ , construct the N reference line in its proper position in relation to the base line.

Lay out the field of fire, constructing the left and right limits  $O_1L$  and  $O_1R$ , respectively.

Select the point M, the midpoint of the base line. With M as the center, and the distance  $MO_1$  as the radius, construct a semicircle on the base line extending in the direction of the field of fire.

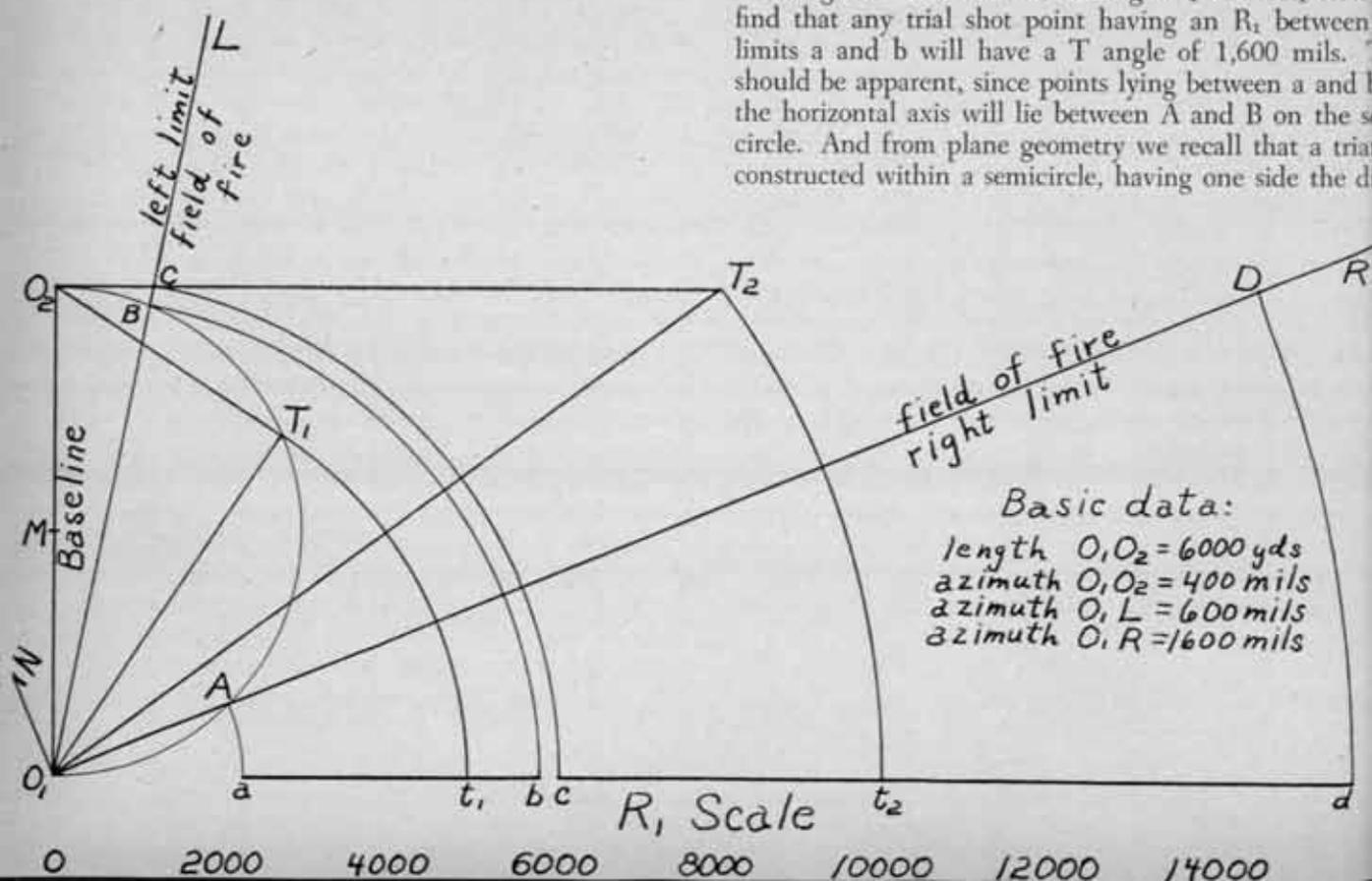
Label the intersections of the semicircle with the right and left limits of the field of fire, points A and B respectively. With  $O_1$  as the center, and radii equal to  $O_1A$  and  $O_1B$ , project points A and B onto the horizontal axis through  $O_1$ . Mark these projected points a and b respectively.

Label the intersection of the left limit of the field of fire with the horizontal axis through  $O_2$ , point C. With  $O_2$  as the center, and  $O_2C$  as the radius, project C onto the horizontal axis through  $O_1$ , and mark this point c. (Note: If the right limit intersects the line  $O_2C$  at a point D, such that the distance  $O_1D$  is not greater than the horizontal range  $R_1$  at which trial shot problems may be fired, project point D onto the horizontal axis through  $O_1$  as above, and mark this point d. Such condition may occur for a very narrow field of fire.)

Mark in a distinctive manner the horizontal axis through  $O_1$ , which lies between a and b, and also that portion which lies between c and d, or from c to the maximum range of the guns if d does not exist.

The initial construction is now complete and from it we may determine the azimuth at which to fire, with a given  $R_1$ , in order that the T angle shall be maximum.

Using the horizontal axis through  $O_1$  as an  $R_1$  scale, we find that any trial shot point having an  $R_1$  between the limits a and b will have a T angle of 1,600 mils. This should be apparent, since points lying between a and b on the horizontal axis will lie between A and B on the semicircle. And from plane geometry we recall that a triangle constructed within a semicircle, having one side the diam-



eter, will be a right triangle. For illustration select trial shot point No. 1 with an  $R_1$  between  $a$  and  $b$ , 5,000 yards for example. On the  $R_1$  scale locate point  $t_1 = 5,000$ . With  $O_1$  as the center, and the distance  $O_1t_1$  as the radius, swing an arc intersecting the semicircle at the point  $T_1$ . Draw the sides  $O_2T_1$  and  $O_1T_1$ . The angle  $O_2O_1T_1$  can be computed from the simple trigonometric relation:

$$\cos O_2O_1T_1 = \frac{O_1T_1}{O_1O_2}$$

Since  $O_1T_1$  is equal to the assumed  $R_1$ , both quantities are known and angle  $O_2O_1T_1$  is easily determined:

$$\cos O_2O_1T_1 = \frac{5000}{6000} = .83333$$

$$\text{angle } O_2O_1T_1 = 596.6 \text{ mils.}$$

The azimuth of  $T_1$  from  $O_1$  is found by adding the azimuth of the base line  $O_1O_2$  to the angle  $O_2O_1T_1$ :

$$\text{Azimuth } T_1 = 400 + 596.6 = 996.6 \text{ mils.}$$

The sides  $O_2T_1$  is computed from the relation:

$$O_2T_1 = O_1O_2 \sin O_2O_1T_1$$

$$O_2T_1 = 6,000 \times .55279$$

$$O_2T_1 = 3,317 \text{ yards.}$$

If ranges between  $a$  and  $b$  are not considered adequate, a trial shot point cannot be selected with a  $T$  angle equal to 1,600 mils. In order to select a point  $T_2$  having the  $T$  angle as large as possible, proceed as follows:

$$\frac{R_1}{\sin O_2} = \frac{O_1O_2}{\sin T_2}$$

$\sin T_2 = \frac{O_1O_2}{R_1} \sin O_2$ . In this equation the factor  $\frac{O_1O_2}{R_1}$

is a constant. In order for  $T_2$  to be as large as possible,  $\sin O_2$  must be made maximum. This will occur when  $\sin O_2$  is maximum. Since the maximum value for the sine of an angle occurs when the angle is 1,600 mils, the maximum

value for the  $T$  angle is obtained when  $O_2$  is 1,600 mils. Referring to the graphical illustration, any trial shot point selected along the line  $O_2C$  which lies within the field of fire will have the  $T$  angle maximum for any given  $R_1$ . Point  $C$  was projected onto the  $R_1$  scale through  $O_1$  and marked  $c$  in the original construction. Therefore, for any  $R_1$  selected between  $c$  and  $d$ , the trial shot point having the maximum  $T$  angle must lie on the line  $O_2C$  between  $C$  and  $D$ . For illustration, select trial shot point No. 2 with  $R_1$  between  $c$  and  $d$ , 10,000 yards for example. On the  $R_1$  scale locate point  $t_2 = 10,000$ . With  $O_1$  as the center, and distance  $O_1t_2$  as the radius, swing an arc intersecting  $O_2C$  at  $T_2$ . Draw the sides  $O_2T_2$  and  $O_1T_2$ . The angle  $O_2O_1T_2$  can be computed from the relation:

$$\cos O_2O_1T_2 = \frac{O_1O_2}{O_1T_2}, \quad O_1T_2 \text{ being equal to the assumed } R_1$$

for trial shot point No. 2,

$$\cos O_2O_1T_2 = \frac{6000}{10000} = .60000$$

$$\text{angle } O_2O_1T_2 = 944.5 \text{ mils.}$$

The azimuth of  $T_2$  from  $O_1$  is found by adding the azimuth of the base line  $O_1O_2$  to the angle  $O_2O_1T_2$ :

$$\text{Azimuth } T_2 = 400 + 944.5 = 1344.5 \text{ mils.}$$

The side  $O_2T_2$  is computed from the relation:

$$O_2T_2 = O_1T_2 \sin O_2O_1T_2$$

$$O_2T_2 = 10,000 \times .79998$$

$$O_2T_2 = 8,000 \text{ yards.}$$

If the field of fire is so wide that the line  $O_1R$  does not intersect the semicircle, it will not intersect the line  $O_2C$ . In this case there is no limiting minimum range for trial shot points having a  $T$  angle equal to 1,600 mils, nor is there any limiting maximum range for points having the  $T$  angle maximum, but not equal to 1,600 mils.



## What's in a Name?

Each Allied vehicle entering Paris is hailed by the cheering populace by the name painted on its side. "Vive Lizzie!" they cry. "Merci, Blackpool."

One of the warmest welcomes was given to a truckload of American soldiers. The crowd looked at the words chalked on the radiator, then yelled for all they were worth: "Vive! Check Oil Level!"—*London Evening News.*

# COAST ARTILLERY

## Citations and Commendations

### Distinguished Service Cross

TO: ROBERT T. FREDERICK, Major General (then Brigadier General), U. S. Army, 5801 33d St., N.W., Washington, D. C.

FOR: Heroism in Italy, January 10 to 13, 1944. While commanding his own organization and an attached task force, he made a personal reconnaissance to determine hostile positions prior to an attack. Far in advance of the foremost elements of his command, under heavy enemy machine gun, mortar and artillery fire, he probed enemy defenses and selected a covered route of approach for his troops. While leading his men against the enemy, he continued his reconnaissance in advance of his forward troops to obtain information from which to plan the development of the attack. Operating in terrain almost devoid of cover and concealment, he organized a surprise attack that quickly drove the enemy from a strategically important position. His constant presence under enemy fire forward of his own troops, proved an inspiration to them, and a decisive factor in the accomplishment of his mission. His heroism, aggressiveness and tactical skill reflect the finest traditions of the Armed Forces of the United States.

### Distinguished Service Medal

TO: JOSEPH A. GREEN, Major General, U. S. Army.

FOR: Exceptionally meritorious service to the Government in a position of great responsibility from 9 March 1942 to 26 October 1944, as Commanding General, Antiaircraft Command. Upon the reorganization of the Army on 9 March 1942 and the establishment of the Army Ground Forces, the Antiaircraft Command was created; its mission was to instruct and train officers and enlisted men for duty with antiaircraft and barrage balloon units and to activate, organize, equip, and efficiently train such units for combat service. From this command came the recommendations with reference to development and standardization of antiaircraft matériel and equipment. Since Pearl Harbor every antiaircraft item of major importance has either been created or considerably modified and improved. General Green fulfilled his responsibilities and accomplished his mission in an exemplary manner, evidenced by the progress of the Antiaircraft Command and in the performance of its units in all theaters. His outstanding leadership in this position was a positive contribution to the war effort.

TO: JOHN T. LEWIS, Major General, U. S. Army, 531 Indian Terr., Rockford, Ill.

FOR: He served as Commanding General, Military District of Washington, from May, 1942, to September, 1944. Despite unusual difficulties arising through the impact in one area of the various chains of command, he developed a harmonious and efficient command and provided for the sound and ade-

quate defense of the Nation's Capital, effectively integrating the many diverse military and naval elements stationed in the vicinity of Washington. Facing an administrative situation of multiple complexities, he provided for the effective operation of the headquarters of the Army during a critical period when the armed forces of the Nation were being deployed in combat throughout the world. In accomplishing his tactical and administrative responsibilities in a highly efficient manner, he maintained close relationships with the civil government, planned and supervised the construction of needed recreational facilities and housing, and provided for the many diverse administrative and supply services for the Military District of Washington and all War Department activities within his command. Through his devotion to duty, his superior leadership and his rare administrative ability he has contributed materially to the war effort.

### Oak Leaf Cluster to Distinguished Service Medal

TO: WILLIAM E. SHEDD, Major General, U. S. Army. Birthplace—Danville, Ill.

FOR: As Commanding General, Antilles Department, from December 1, 1943, to August 26, 1944, he accomplished two complete reorganizations of the Antilles Department necessitated by adjustment in troop allocations as a result of changes within the world situation in the prosecution of the war. He has at all times effected the successful coordination of joint Army and Navy activities within the Antilles Department and through his diplomacy, tact and foresight has contributed to a large degree to negotiations with colonial representatives of Allied Governments within the area of the Caribbean Coast. Frontier. (General Shedd had been awarded the Distinguished Service Medal for services in the organization, equipping and training of Heavy Artillery troops in France during the World War.)

### Legion of Merit

TO: CORTLANDT VAN R. SCHUYLER, Brigadier General, U. S. Army, 15 Lenox Pl., Maplewood, N. J.

FOR: Service as Executive, G-4 Section, later as Assistant Chief of Staff, G-4, and finally Chief of Staff, of the Antiaircraft Command from March 9, 1942, to December 10, 1943, and Commanding General, Antiaircraft Artillery Training Center, Camp Davis, North Carolina, from December 10, 1943, to October 13, 1944. At the time when the newly created Antiaircraft Command was faced with a tremendous expansion and training program, with serious shortages of weapons and instruments and with the urgent need for many new and improved types of equipment, he displayed superior initiative, judgment, tact and executive ability in effecting the necessary coordination between the using troops and the various supply and development agencies, and in securing

expeditious and efficient distribution to antiaircraft units of the limited quantities and items then available. From his broad experience in antiaircraft matériel and gunnery matters and by his judicious handling of the many details of development problems, he contributed greatly to the expediting of service tests and standardization proceedings for new equipment and to the elimination of administrative delays from the complicated antiaircraft development program. Early in the present conflict he foresaw the need for increasing the fire power of antiaircraft automatic weapons units and was in large measure responsible for initiating the development of the present standard antiaircraft power-driven, multiple machine-gun mount. Later as Chief of Staff of the Antiaircraft Command he actively assisted in coordinating the progress of matériel developments with antiaircraft training requirements and he succeeded in improving the operating efficiency of the headquarters staff. His untiring services as Training Center commander resulted in efficient and successful preparation of many Antiaircraft Artillery units for combat. He has made an outstanding contribution to the antiaircraft training and development program.

### Oak Leaf Cluster to Legion of Merit

TO: JACK R. LEHMKUHL, Lieut. Col., CAC, 1039 Merced St., Berkeley, Calif.

FOR: Services from November, 1940, to January, 1943. While assigned to the Harbor Defense of San Francisco from November, 1940, to July, 1942, he exhibited marked professional and organizational ability in aiding the activation and training of the Sixth Coast Artillery, 18th Coast Artillery, 56th Coast Artillery and 54th Coast Artillery, and in organizing the Harbor Defense Command Post and Harbor Entrance Control Post. As S-1 and Battalion Commander, Antiaircraft Replacement Training Center, Camp Wallace, Texas, from August, 1942, to January, 1943, he exhibited outstanding professional and organizational ability in planning, improving and installing administrative systems and procedures. His extraordinary devotion to duty, loyal cooperation and exceptionally meritorious manner of performance of duties have materially aided in the efficient training of thousands of troops.

### Silver Star

TO: HUBERT G. CURRY, Staff Sgt., CAC, Box 8, Neoga, Illinois.

FOR: In the vicinity of Parai Beach, Biak Island, on June 12, 1944, the platoon to which he was assigned was changing gun positions. While exposed to fire from the enemy during the movement, an enemy mortar made a direct hit on a prime mover, upsetting a gun being towed behind. The platoon moved on, leaving the gun to be recovered later. Knowing the hazard involved, he and his commanding officer returned to salvage the equipment and prevent it from falling into the hands of the enemy. When within about 50 yards of the gun, in the face of enemy fire, he started the motor of the truck as the enemy opened up with mortars and larger caliber weapons, which set the vehicle afire, exploding some ammunition, again forcing him to take cover. The next day, with the aid of a tank, he righted the gun and removed it from the area. His courage and devotion to duty are worthy of the highest praise.

TO: HOMER L. GAYHART, PFC, CAC (Airborne), 3584 Hendrick St., Memphis, Tennessee.

FOR: (Information not released for publication.)

### Soldier's Medal

TO: EMILIEEN RAYMOND CHAMPAGNE, PFC, CAC, 1282 West Ave., Buffalo, N. Y.

FOR: At Gusap, New Guinea, on March 4, 1944, he went to the rescue of a person who was in danger of drowning in the Ramu River and was being carried down the river by the swift current. He risked his life and assisted another soldier in pulling the drowning man safely to shore.

TO: FRANK JULIANO, Pvt., CAC, 310 Sixth St., Fairview, New Jersey.

FOR: At Gusap, New Guinea, on March 4, 1944, he went to the rescue of a person who was in danger of drowning in the Ramu River and was being carried down the river by the swift current. He risked his life and assisted another soldier in pulling the drowning man safely to shore.

TO: WILLIAM A. RICHARDS, Warrant Officer, jg, CAC, 4717 W. Addison St., Chicago, Illinois.

FOR: Heroism October 22, 1943, in Sicily.

TO: WILLIAM W. THOMPSON, Pvt., CAC, Glenwood Gardens, Hamilton House, Ravine Ave., Yonkers, New York.

FOR: Heroism at Camp Cretin, New Guinea, on March 11, 1944.

### Bronze Star

TO: FRANK E. COSTANZO, Major, CAC, 412 South St., Steubenville, Ohio.

FOR: (Information not released for publication.)

TO: PALMORE A. FERRELL, Major (then Captain), CAC, Blacksburg, Virginia.

FOR: The invaluable information he obtained while participating in a commando reconnaissance raid on the enemy-occupied Green Islands, Solomon Group, on January 31, 1944, made possible the expeditious occupation of heavy antiaircraft gun positions when the Allies seized and occupied the islands two weeks later.

TO: MARVIN A. GEHRMAN, Staff Sergeant, CAC, Amery, Wisconsin.

FOR: (Information not released for publication.)

TO: MATTHEW IANNIELLO, Corporal, CAC, 1736 65th St., Brooklyn, New York.

FOR: At New Britain, during the night of December 13, 1943, when one gun in the perimeter defense of his unit was endangering friendly troops with misdirected fire, he, convinced that the gun had not fallen to the enemy, crawled forward to the position despite the heavy fire and the strong possibility of the enemy's having the gun. He shouted to stop the fire, then readjusted the range. By his intrepid action, he saved the gun crew, prevented unnecessary casualties, and facilitated coordination of the defense.

TO: MILTON H. JOHNSON, Technician 5th Grade, CAC, Eau Claire, Wisconsin.

FOR: (Information not released for publication.)

TO: PATRICK MURRAY, Technician 5th Grade, CAC, 316 Clinton Ave., Watertown, New York.

FOR: (Information not released for publication.)

TO: JOHN NOLAN, Technician 4th Grade, CE, 1662 E. 38th St., Brooklyn, New York.



# Trends in Antiaircraft Artillery and Coast Artillery Organization and Equipment

By Lieutenant Colonel E. V. Hungerford, Jr.

The field has long felt the need for information concerning new items of equipment and changes in antiaircraft artillery and coast artillery organization before they are actually published in *Tables of Organization and Equipment*. To fill this need each future COAST ARTILLERY JOURNAL will include changes as they are approved by the War Department.

Through these columns Coast Artillerymen will have advance information of changes which will later be reflected in *Tables of Organization and Equipment* along with a brief description of the item (where possible) and reason for inclusion of the item.

THESE NOTES DO NOT CONSTITUTE AUTHORITY TO REQUISITION EITHER PERSONNEL OR EQUIPMENT LISTED HEREIN.

## ANTIAIRCRAFT ARTILLERY

### Army Antiaircraft Artillery (T/O & E 44-200-1)

This new organization has been prepared to provide the needed unified command headquarters under a Field Army and replaces the old antiaircraft artillery section in the Army Headquarters. The Headquarters Army Antiaircraft Artillery is designed to act as the command headquarters for all antiaircraft artillery in a field army not attached to Corps and Divisions. The Commanding General of the Army Antiaircraft Artillery will act as adviser to the Commanding General of the Army on antiaircraft matters and is provided a colonel as liaison officer. T/O & E 44-200-1 provides fifteen officers, one warrant officer and sixty-two enlisted men. The Commanding General of the Army Antiaircraft Artillery may be a major general provided there are two or more antiaircraft brigades, or their equivalent in groups and battalions, under the Army (and not attached to Corps and Divisions). If there is less than one brigade of antiaircraft under the Army, either a brigade headquarters (T/O & E 44-10-1) or the Army Antiaircraft Artillery commanded by a brigadier general (T/O & E 44-200-1) will be assigned to the Army. The brigadier general in either of the latter cases will act as adviser to the Commanding General of the Army on antiaircraft matters.

### Antiaircraft Artillery Operations Detachment (T/O & E 44-7)

The antiaircraft artillery operations detachment has been amended to provide for changes in personnel and equipment when the radio set SCR-399 is issued outside continental United States when authorized by the Theater of Operations Commander. Two additional radio operators, a 2½-ton truck and K-52 trailer are provided when the radio set SCR-399 is issued.

Switchboards have been reduced and changed to BD-95's. Switchboard operators have been reduced to three, a Staff sergeant, supply has been added as well as a cook for attachment to the brigade or group mess to which the detachment is attached.

### AAA Gun Battalions (T/O & E 44-15 and 44-115)

An additional Unit generator has been authorized both the mobile and semimobile gun battalions when 90mm guns on M2 mounts are issued. This has been necessary due to the additional power required by the M2 mount. An additional 2½-ton truck and M18 trailer are added to each mobile battery for transportation of the additional generator. In the semimobile battalion one additional M18 trailer has been provided in order to move one battery per shuttle.

### AAA Automatic Weapons Battalions (T/O & E 44-25, 44-125 and 44-75)

Mobile and semimobile automatic weapons are now authorized a new mount similar to the carriage, machine gun, multiple cal. .50, M51. This new mount however has small detachable wheels and is carried in a 2½-ton truck. 1-ton trailers are provided, one per gun section in the mobile automatic weapons battery and eight per semimobile battalion headquarters battery, to transport the equipment displaced in the 2½-ton truck by this mount.

Special winter clothing comprising mittens, overcoat parka type, and wool toque is now authorized enlisted men of the self-propelled automatic weapons and machine gun squads.



# COAST ARTILLERY



## BOARD NOTES

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.

Items pertaining to Antiaircraft Artillery should be sent to the Antiaircraft Command, Fort Bliss, Texas.

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*Combination sponge rammer for 155mm guns.* A combination sponge rammer employing a sponge similar to the Chamber Sponge T10 for the 8-inch Gun Mk. VI, Mod. 3A2, is to be tested in the near future to determine its suitability for use with 155mm guns. The sponge for the above-mentioned sponge rammer will be composed of brush sections connected by springs to the rammer staff so that the diameter of the sponge head will conform to that of the powder chamber.

A second combination sponge rammer is being developed and will be tested as soon as possible in comparison with the sponge rammer mentioned above. This second sponge will be composed of notched neoprene disks with a cloth glove on each section of each disk. The sections of the successive disks alternate to cover the notches of the preceding disks.

*Subcaliber Gun T12.* The Subcaliber Gun T12 for the 16-inch Gun M1919 (Army) was tested recently and was found to function satisfactorily. The standard firing circuit and firing mechanism of the 16-inch gun are used; however, a special spindle is necessary. The Board recommended that the T12 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 Gun T12, including the necessary wrenches, headspace adjustment tool and gauge, cleaning equipment, and cartridge case extractors.

*Modification of head and chest sets to permit use of T30 or T45 microphones.* Means have recently been made available whereby the Chest Unit T26, which is a component of Head and Chest Set HS-17-A and HS-19 and of Chest Sets TD-1 and TD-2 now being used by most Coast Artillery organizations may be modified to permit convenient use of Throat Microphone T30 or Lip Microphone T45. This modification is covered by Modification Work Order SIG 19 dated November 1944 and involves the use of Conversion Kit MC-545. The leads from the switch on the breast plate to the microphone are cut, a Jack JK-48 connected to the leads from the switch and the

leads to the microphone replaced by Cord CD-1250 which has a Plug PL-291A on one end. When using the microphone on the chest unit, this plug is inserted in the Jack JK-48 connected to the switch. When using the Microphone T30 or T45, the Plug PL-281 on these units is inserted in the jack connected to the microphone switch. The necessary conversion kits to make this modification can be obtained by requisition through local Signal supply channels.

*Army mine planters.* A continued study by the Board of the design of an Army mine planter with characteristics superior to those of the M1 planter has resulted in the approval by Army Ground Forces of a recommended set of military and technical characteristics for the future development of Army mine planters. While there are numerous minor deficiencies in the present design which require attention, the major improvements recommended have resulted from a change in concept of the planter from a medium size ocean going type of craft to a comparatively smaller utility vessel designed to operate only in one harbor defense, but capable of being towed to distant places. This basic change in concept will allow various improvements to be made in the design with respect to the amount of free deck space available, the load handling facilities, and the speed and maneuverability. Further advantages are to be gained in the much reduced cost of procurement and maintenance of the smaller vessel and the reduced number of operating personnel necessary. During the Board study of this subject, various small craft of current Navy and Coast Guard design were used by the Board in test planting operations with varying degrees of success. Salient features of all these craft were considered in formulating the military characteristics desired in the future design.

*AMTB-40mm.* Recent firing tests concluded by the Coast Artillery Board have drawn further attention to the value of the M5-( ) director as a primary means of fire control for the 40mm Bofors used in an AMTB rôle. Tests included the use of the M7A1 computing sight and the on-carriage M3 sighting system. Both of the latter methods were seriously hampered by the obscuration from carriage

by smoke and fumes. The two most successful methods of fire using the M5 director were:

(1) Set the range handwheel at a median range. Set the elevation rate at zero and turn the elevation aided tracking motor off. Aided tracking to be used in azimuth and adjust fire by tracking off in both the elevation and azimuth telescopes.

(2) Set the range handwheel at an estimated median range. Set both elevation and azimuth rates to zero and turn off both aided tracking motors. Fire adjustment to be accomplished by tracking off in both the elevation and azimuth telescopes.

Both of the above-mentioned methods proved satisfactory during firing at a high speed target towed by a JR boat.

*Field suppression of Power Unit PE-84( )*. The Coast Artillery Board recently reviewed a preliminary copy of War Department Modification Work Order SIG 11-915-D, dated 12 September 1944, titled "Modification of Power Unit PE-84( )", which describes the procedure necessary to eliminate radiated and conducted interference from the unit over the frequency range normally used for communication radio. The PE-84( ) is used with a radio set and has in some locations caused serious radio interference in its vicinity. The engine, exciter, and control panel are all to be shielded by the proper use of capacitors together with bonding and grounding by means of copper braid and lock washers. The complete modification requires eighteen man-hours.



## Small-Arms Care

Few American boys grow up without learning to "tinker," whether it be with radios, automobiles or some other type of mechanical equipment. In normal life this is a habit to be admired and encouraged, and it has been a big help to the Army in finding men with mechanical abilities. But there are also occasions in the Army where tinkering is the cause of needless and costly damage to equipment.

This has proven to be the case in the instance of small arms, for many soldiers are attempting unauthorized disassembly and repair of their weapons. The result is that too many weapons must be sent in to higher echelon maintenance units for repair.

The damage that is done by the inexperienced soldier is almost unbelievable. For example, screw heads are ruined by the use of wrong-sized screw drivers or instruments never intended to be used as screw drivers. Set-screws, machine-screws and the like are changed without regard for interchangeability with the result that stripped threads render them useless. Parts of weapons are disassembled or assembled with force, which results in burring and damaging the parts. Care is not taken to protect disassembled parts, so loss or damage to the parts occurs. Tension or compression of springs is changed, trigger pull action is modified and damage usually results.

Modern weapons are manufactured by skilled technicians. Repairing them requires specific tools, the right amount of time and practiced hands—and these essentials are seldom, if ever, available to the soldier in the field. There are only two services the soldier is authorized to perform on his small arms—*clean* and *lubricate*. This includes,

of course, field stripping, in which no tools are required. The Field Manual for the individual weapon specifies just what may and what may not be done in performing these services. Therefore, it is the unit commander's responsibility to see that the instructions in these manuals are available to and learned by the soldier. The manuals, all in the 23 series, are listed in FM 21-6, and copies may be obtained from The Adjutant General's Office by presenting evidence that they are needed.

Cleaning and lubricating have been made as easy for the individual soldier as possible, so there is no valid excuse for failing to perform these services. The new rifle bore cleaner and preservative lubricating oil are both issued in handy, cigarette-pack size containers which can be carried in a cartridge belt and thus be readily available for use at all times. And cleaning patches now come in small packs of 25, wrapped in water-and-dirt-proof paper envelopes.

A rifle, carbine or pistol that is always cleaned soon after firing and for three successive days afterwards will keep its accuracy and dependability indefinitely. So far as the soldier is concerned, proper care, use and handling are the only other requisites for effective maintenance. But personnel responsible for storing and shipping small arms have the added responsibility of protecting them against corrosion and rust, packing them properly in *standard field containers* and storing them in dry places.

These few simple practices, if faithfully and carefully followed, can do much to keep high echelon maintenance of small arms—costly in terms of both time and money—at a minimum.

# Coast Artillery Journal

Fifty-fourth Year of Publication

COLONEL E. B. WALKER, Editor

LT. COL. ARTHUR SYMONS, Associate Editor



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

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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 coöperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.

## News and Comment

### Regarding Required Military Training

The National Education Association states that of adults aged twenty-five or over 4% have never gone to school; 13% have not completed fourth grade; 56% have only an eighth-grade education or less; 75% have not finished high school.

In the Army, even in peacetime, unit commanders were continually searching for men of sufficient education to train for clerical and specialists positions. The war necessitated establishment of innumerable schools to train and qualify men for specialists positions; the Navy requires even a greater percentage of technical specialists. Warfare grows increasingly technical and dependent on special training.

In order to provide proper training for our youth, a proper military program should not only include nationwide military training but also should insure that all youths receive a sound basic education in our high schools and colleges. Attendance at such a course should be made compulsory and the withdrawal of boys and girls from the grade schools and from high schools in order to help support others should be made unnecessary through state and federal financial aid.

From texts so far published concerning a proposed system of required military training for young men between ages of 18 and 20, it is not clear just how we are to produce officers for future wars and for training the trainees.

The reserve officer who in peacetime is willing to take extended active service in order to train draft personnel is, generally speaking, a "professional reserve," one who is less apt to be making a success in civil life and to be looking for a temporary refuge; consequently he would not be the type that makes for the best success in the Army.

In peacetime the Regular Army was severely handicapped in its own training because of demands on its personnel and time for training the R.O.T.C., the O.R.C., the C.M.T.C., to which groups was given the best of the training year. The training of Regular Army units thus left much to be desired.

The Regular Army should exist separately and train separately from the mass of trainees who should be trained by reserve officers supervised and coached by regulars who have been in combat in this war. The number of regular officers should be increased by the number necessary for this handling of trainees, and thus avoid handicapping Regular Army units which will have all they can do to keep properly trained for combat—no more garrison-trained army.

As to age for trainees, 18 to 20 appears the best age, but why not make it at the completion of high school or at 18 if high school is not completed by the time 18 is reached? Coupled with an education program geared to the military program as already suggested, all youth would have the opportunity to gain a high school education.

A great advantage would be the effect on the trainee. The average boy on graduating from high school does not know what he wants to do, what walk of life to enter. A year of military training, of contact with other boys from all sections, a knowledge of the demand for specialists and an opportunity to attend specialists training would greatly aid in settling his mind as to his future and in "making a man of him."

✓ ✓ ✓

### Always Room for 1,000 More

The loud groan from the direction of the Circulation Department resulted from the realization that the only group subscriptions since the last issue were the following: ten from the 268th CA Battalion, Lieutenant Carl D. Peters, Adjutant; fourteen from units of the 204th AAA Group, Captain Herman I. Silversher, Adjutant; and eighteen from the 902d AAA AW Battalion, Major H. G. Wood, Executive.

The paper shortage is still a problem, but the JOURNAL will do the worrying about that difficulty if you folks out in the field will keep sending in subscriptions.

✓ ✓ ✓

### Foreign Currency

Up to early in December, the JOURNAL accepted foreign currency at full value, but present arrangements for redeeming money of other countries costs your magazine up to 60% of the rated value in some cases. Regretfully we can no longer accept foreign currency in payment of obligations to the JOURNAL; money of other countries will be returned to the sender.

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### Crichlow Slide Rules

Crichlow Slide Rules have been reduced in price. They are now \$1.25, as contrasted with the former price of \$1.75. Order them through the JOURNAL.

✓ ✓ ✓

### In the Interest of Amity

*The Gunner,*  
London,  
1 December 1944

Dear Colonel Walker,

May I congratulate you on your extremely interesting September issue?

And may I at the same time point out, in the interests of good feeling between our two armies, that your excellently clear maps of the operations in France hardly give the part played by the British troops in the true proportions. No doubt it is due to incomplete knowledge at the time you went to press, and I dare say you have already rectified it in your November issue. For example, the remarkable dash for Amiens and Antwerp is not brought out. And as regards the fighting, I have a letter from one of your regimental commanders who was right through it in which he writes: "Any fool not blinded by national illusions can see that the bloodiest fighting has fallen to the British. The best Ger-

man troops and the bulk of his matériel have appeared to me to be massed against your army."

And are your people aware of General Montgomery's self-sacrifice in deliberately drawing this force against his British troops in order to draw them away from your Third Army? Our soldiers are aware of it now, and they sometimes wonder how far yours are also aware of it. Obviously the more widespread the dissemination of the truth the better for all of us.

Good luck to the COAST ARTILLERY JOURNAL!

I was a coast artilleryman myself, at Singapore not many years ago!

Yours sincerely,  
ALFRED BURNE, Lt-Col. (Ret.).

\* \* \*

Colonel Burne, the noted editor of *The Gunner*, need have no fears about American realization of the great contributions of the British in France. In our November-December issue we quoted General Eisenhower as follows:

"The Germans knew that their whole position was hinged on Caen where every bit of dust was a diamond and every inch worth ten miles lost elsewhere. Those British writers who had been apologetic for the slow progress around Caen should have been bragging for it was the strongest defensive line on the French front where the bulk of the German armor had been concentrated."

Any failure to present in maps the full picture of the great contributions of the British and the Canadians in the Battle of France was due to the space limitations (brought about by paper rationing) which prohibited the JOURNAL from publishing enough maps to indicate the entire story, or to discuss the relationship of the parts played by the various armies.

That the fiercest fighting and the strongest German resistance occurred in front of the British forces was apparent. The containing of large German forces in that sector was in no small measure responsible for the rapid progress of Allied forces further South.

✓ ✓ ✓

### New U-Boat Tactics

The satisfactory statement just issued on the war against the U-boats concludes with a pertinent warning that hard fighting to maintain the present full command of the sea may have to be resumed at any moment. The enemy has introduced a number of novel technical devices, including in particular the "extensible air intake and exhaust which enables U-boats to remain submerged for long periods" and has permitted some of them to penetrate into areas previously denied to them. There are other unspecified devices which may prove equally if not more efficacious. It would be a mistake, however, to rate the enemy's ingenuity too highly. The "breathing-pipe," for instance, can be used when the U-boat lies on the bottom, in water which is not too deep, to enable its diesel engine to be run for recharging the electric batteries, which provide the means of propulsion under water, and incidentally to ventilate the vessel. Thus there will be no need to re-surface, as has been necessary hitherto at intervals of not

more than twenty-four hours. It is even possible that the device may have been adapted for use under way while submerged, though this will almost certainly be possible only in conditions of smooth water, slow speed, and shallow depth. But this immunity for long periods from observation from the air can only be purchased by accepting severe handicaps in other directions. The power to remain submerged does not affect the liability to detection by the asdic, while the noise of a diesel engine in use under water greatly increases the possibility of detection by hydrophone.

At the height of their earlier ascendancy the U-boats owed most of their success to the great strategic and tactical mobility conferred by the unfettered use of their high surface speed. Under water that mobility is sacrificed altogether; convoys that might have been attacked at speed on the surface will escape, and attacks will tend to be restricted to convoys which chance to approach the submerged raider on a favorable bearing. Moreover, to make an attack at all, the U-boat must come within striking distance of its quarry. It is to prevent this that the utmost vigilance of the surface escorts is devoted, and the breathing pipe can give no extra protection. This particular new device is in fact very largely defensive. It may save a number of submarines from the destruction that would rapidly overtake them if they left harbor without it; but there is no obvious reason to expect that it will lead to an appreciable increase in the losses of allied merchant shipping.—*London Times*.



### Hollow-Charge Explosives

Several new weapons now used by the British Army owe their origin to the work of scientists on the investigation of the principle of the "hollow charge" in explosives.

The detonation of a charge of explosive results in blast which travels in all directions and by this means achieves the object of causing general destruction. For the special purpose of achieving directional explosive effect the principle of the "hollow charge" has been used. The effect of

an explosive charge can be concentrated or focused by hollowing out the surface of the charge on the side against the object to be attacked. Thus it was known that a hole could be blown through the three-inch steel wall of a safe by the use of a hollow charge of dynamite, which when exploded as a flat mass on the surface of the safe produced no material effect whatever.

Whereas the normal explosive charge exerts a general shattering effect, the hollow charge exerts a piercing effect and punches a hole of more or less even diameter even in the hardest of steel or the most resistant of concrete. The elucidation of the principle in its application to service has occupied a number of chemical and physical experts over a period of some years, but the state of knowledge reached a level some time ago at which it was possible to introduce the principle into weapons of war. The hollow charge principle has accordingly been introduced into two types of weapons: (a) demolition charges, and (b) missiles or projectiles. The object achieved with each type is a very much deeper penetration of the target with an accompanying diminution of the quantity necessary.

Special demolition charges range from small cylinders weighing ten pounds (known as "Beehives"), which are able to penetrate nearly a foot of solid steel or two feet of concrete, to heavy assault charges designed to penetrate the thickest pillbox wall and kill the occupants.

"Beehive" type charges may be used to produce rapidly a borehole in masonry, concrete, or brickwork. For example, in bridge demolitions boreholes would be made in piers or abutments, and afterwards filled with explosive which on detonation causes complete disruption. The modern heavily reinforced steel and concrete bridge is so strong that a great deal of time and explosive are necessary to effect a complete demolition. A shaped charge, known as the "Hayrick," has been produced, in order to deal with these bridges. The "Hayrick" cuts along a line, and when fired beneath a reinforced concrete beam or slab it cuts through, and so reduces the structural strength that the bridge span collapses.—*London Times*.

## British Airborne AA Guns



Two types of 20mm AA guns, used by the British in airborne operations, are shown: *left*, Hispano-Suiza; *right*, Oerlikon.



British Official

The remains of the first jet-propelled Messerschmidt 262 to be shot down by the RAF. One of the jet power units appears on the left.

### Ten Percent Hits

In republishing *Ten Percent Hits with the Director*, by Lieutenant Frank B. Aycock, which appeared in the September-October (1944) COAST ARTILLERY JOURNAL, the *Marine Corps Gazette* added the following editorial note:

*This article by Lieutenant Aycock represents the latest and best in firing technique for the 40mm gun and director. This system makes the 40mm so reliable that if you don't get hits, you no longer charge it off as a "bad day," you look for something you forgot to do, or did wrong. The methods described have been tried during training by the Light Antiaircraft Group of a Marine Defense Battalion, and the results were outstanding. The shooting of the organization improved from mediocre to excellent, and so immediately that there can be no doubt that Lt. Aycock's system was the principal contributory cause.*

All of which brings us to wonder if all Army AAA units are now using the same system.



### New BG's

Two Coast Artillery Corps colonels were promoted to the grade of Brigadier General (temporary) 21 November 1944: Robert W. Berry and John H. Wilson.

### A Few Bouquets

"Although temporarily in the Infantry many of us hope for a quick return to AA or Seacoast and the JOURNAL is filling a big job in keeping us in touch with our first love."

CAPTAIN JOHN T. O'HEA.



"Thank you for your promptness in filling past orders. It is a distinct help to be able to obtain desired books through you with such promptness."

LIEUTENANT JOHN W. REILLY.



"The JOURNAL has provided me with very pleasant reading for a long time, and has been very good in reporting the action of the AAA units throughout the world."

CAPTAIN H. D. HANNETT.



"The JOURNAL certainly is a swell magazine. It gives you the lowdown on anything and everything concerning the Coast Artillery.

"When I read some of the material I realized what work the fellows must put into study so they can be the best trained men there are. It sure shows that training is necessary. In short, I think the JOURNAL is great."

MISS JESSIE B. NEVIN.

## "There's Nothing in Front of the Infantry but the —Enemy AAA"

By Franklin Banker

Somewhere in Belgium, Dec. 24. (Delayed) (AP).—Anti-aircraft gunners who stayed and fought after the infantry withdrew played a vital rôle in preventing the German break-through from going any farther by knocking out the first enemy tanks they had ever seen.

One of the standout jobs in the vicinity of Stavelot was that of an anti-aircraft battery commanded by Lieut. Leon Kent of Los Angeles, which destroyed five German tanks—including one "King Tiger"—in two to three hours.

Two Panther tanks were knocked out with borrowed bazookas by a pair of ack-ack boys who never had fired a bazooka before. Never given to wasting ammunition, they nailed the tanks with a total of four rounds. The successful gunners were Pfc. Roland Seamon, Clarksburg, W. Va., and Pvt. Albert Darago, of Parkeville, Md. Their battery had been assigned to defend a crossroads with a 90mm gun normally used against German planes.

"The first thing you know a King Tiger tank, which is twice as big as our Shermans, came rolling up the road," said Lieut. Donald McGuire of Seattle, Wash., battery range officer. "We waited until it got in full view and then let them have it. It caught fire and we killed the crew as they ran out.

"After our infantry retreated with word that they'd send up reinforcements, two more Panthers came along. We got them both with good old 90mm treatment."

Then McGuire added: "We'd still be there if the Germans hadn't brought up machine guns. We had no machine guns—just carbines. So we had to pull out after putting our 90mm out of action with a rifle grenade."

### The Dover Guns

"Linstock," in *The Gunner* (a British publication which is probably the most readable of all artillery journals) writes of the now-famed Dover guns:

The real tussle came when the German shipping in Boulogne essayed to escape from the impending siege of that town. Obviously it was no use their attempting the western passage. Through the Straits of Dover they were therefore forced to go, and little can they have relished it.

At the first blush it would seem that they had little to fear from our guns: they were small and speedy, with a speed up to forty miles per hour. By hugging the French coast they necessitated our guns firing at anything up to 40,000 yards. What chance can a slow-firing 15-inch gun have at such a target at such a range? A deterrent value perhaps, but nothing but a fluke would ensure a direct hit. So one would think; but one would be wrong. There is good evidence that our guns did on occasion think it worth while engaging quite a small clutch of E boats or trawlers, only two or three in number, and yet manage to sink some of them. Marvelous!

Phase two followed when the Canadian Army came to grips with the town of Boulogne, and our coast guns were

called upon to give direct assistance in the battle. Now also was a totally unprecedented task thrown upon coast artillery. Consider the matter. The Straits are twenty miles wide at their narrowest. From this it followed that in order to engage land targets ranges upwards of 40,000 yards would be necessary. The targets engaged were principally German guns in the Calais area which were engaging the Canadians attacking Boulogne. On the very first day our guns achieved a signal success, obtaining a direct hit on a Calais gun which had been particularly noxious to the inhabitants of Calais. It never fired again. At least one other gun was knocked out in the first day of the action, and even an AA battery was silenced. Pretty good!

On another day a single salvo was successful in getting direct hits on the two guns of the battery engaged.

But perhaps the most remarkable piece of gunnery of all was obtained at only slightly shorter range, this time against trawlers. A direct hit was obtained on one trawler; a second trawler came alongside, presumably to take off the crew. A second salvo was fired and both ships were hit and immediately sank! Hats off to our Dover guns!

### Hell or High Water

The guys in "B" Battery of the 534th Ack Ack outfit crouched low in their overcoats, stamped their feet in the mud and now and then moved toward a half-hearted fire of two boards and some ration boxes.

"Manning ack-ack guns calls for naturally warm-blooded men," offered Sergeant Stanley Gowan, a section chief. "For a guy who drops in it looks like a soft job and it is in a way but come hell or high water we man these babies—and this kind of weather is hell and the high water is on the way."

The krauts haven't buzzed around much lately but you never can tell and that's the reason you see the ack-ack boys out there taking the rain, the mud, the cold and whatever else the French climate has to offer.

If you call it that, the "monotony" was relieved recently when Tec 5 Wilbur Kriegel knocked down a German plane which flew in low for an apparent strafe job only to run into a 50-caliber slug which Kriegel tossed in its direction. The leaden stream chewed the tail off the kraut.

Things like that come up maybe just once in awhile, maybe more often. It's because you never can tell that makes the ack-ack watch-dogs keep on their toes.

The 534th got in its best licks at Cassino, slugging down some nineteen or twenty Germans but what Gowan remembers most is the day the Americans loosed their heaviest tonnage of bombs on that Italian city.

"The bombs rocked us around like straws," he recalled, "and I remember my pup tent was shredded like cabbage—that's a day all of us will remember."

Platoon Commander Lieutenant F. A. Pace believes the new GI wasp wagons, as the boys call the trailers which mount four 50-caliber machine guns, are about the slickest thing out yet in the realm of air defense.

"They throw lead at the rate of—well, plenty fast," he grinned.—*Beach Head News.*



Press Association

It is considered sacrilegious to look down upon Japan's Emperor, but more and more Americans are gaining the privilege. The numbers indicate (1) Hirohito's palace; (2) the 40-foot moat that protects the palace from the curious; (3) central police headquarters; (4) a plaza which is as close as common people can get to the Emperor; (5) Imperial Theater; (6) financial district; (7) central railroad station; (8) canal used for transportation, and doubling as a fire-break; (9) a park area; (10) Yasakuni shrine and museum; (11) British Embassy.

### Pentolite

A super explosive called pentolite, twenty per cent more powerful than TNT, is being used in rocket projectiles.

Maj. Gen. L. H. Campbell, chief of Army Ordnance, said in announcing this today that a "small quantity of this explosive" will penetrate five feet of reinforced concrete.

Besides providing "terrific punch" for bazooka ammunition and other rocket projectiles, the Army added, pentolite also is employed in rifle grenades, antitank explosives, certain types of artillery shells, for demolition work and for clearing wrecked harbors such as that of Cherbourg.

The explosive has been known since 1891, but because it was so sensitive to friction it was held to be too dangerous to manufacture. Army Ordnance experts now have found a way to use the explosive by mixing it with TNT, and thus producing safely enlarged quantities of the material for the rocket projectors.—Associated Press.

### Renew and Bill

In December of 1901, within two months after he accepted a commission as Second Lieutenant of Artillery, William H. Wilson subscribed to the JOURNAL. On 5 January 1945, Major General William H. Wilson (Ret.) sent the JOURNAL his forty-third renewal, forty-four years a subscriber without a break. We hope General Wilson retains his record as our oldest continuous subscriber for many years to come.

✓ ✓ ✓

### What We Try to Do

"I must say that the JOURNAL has kept me in close contact with the changes in Coast Artillery and has served me very well in my status as an antiaircraft artillery officer overseas."

LIEUTENANT FRED Z. NICHOLS, JR.

### A Prophet is Honored

That the Coast Artilleryman thinks of problems that are not necessarily related to his job is indicated by the photograph of a model and extracts from a letter, printed below:

\* \* \*

Jan. 28, 1942

SUBJECT: Use of Specially Equipped Tanks to Counteract Tank Obstacles.

TO: X X X.

1. It is recommended that consideration be given to the addition of a heavy type or special type bulldozer blade to equipment for light and medium tanks. Certain tanks of a tank company could be equipped with a hydraulically operated bulldozer blade for the purpose of clearing obstacles such as antitank mine fields, antitank ditches, road craters, and various other similar obstacles.

2. Inclosure No. 1 is a sketch of a bulldozer blade attached to a light tank. Inclosure No. 2 shows methods of disposing of obstacles of the type described in FM—

\* \* \*

GEORGE M. HAYS,  
1st Lieut., C.A.C.



It may be that this idea was the seed which grew into the hedge-removing tanks used in France and elsewhere. At any rate, it indicates that the Coast Artilleryman is not "concrete."

\* \* \*

### The Mails May be Slow

Gentlemen:

Received the Coast Artillery ring December 2. It arrived in good condition and I am more than satisfied with it. My order was mailed June 3—I mention this only as a matter of information.

The fulfillment of my order is greatly appreciated. Thank you very much.

T/Sgt. ROY L. GARDNER.

### Progress in 1944

The B-29 Superfortress, speedy, long-range battleship of the air, was put into service by the Army.

The CW-20E, luxury airliner version of the military transport, was designed to meet the needs of medium-range airline operations; the cross-section of the fuselage is shaped like a figure-8 to permit maintaining constant atmospheric pressure and oxygen supply regardless of altitude.

The C-82 cargo plane, utilizing the twin-boom tail, was developed to carry heavy loads of troops and supplies to points where other cargo planes cannot land.

A droppable fuel tank attached to the wings of aircraft was announced which increases the operational range 60% with only a 2% decrease in top speed.

The stabilizing device for helicopters, placed between the mast and the rotor to keep the rotor in a horizontal plane regardless of the angle of the fuselage with the earth, was announced.

Jet-propulsion was used for fighter plane power for high speed, high altitude operation, and jet boosters for lifting heavy aircraft off the ground during takeoff.

Jets of air were discharged at the tips of rotor blades of helicopters to improve the efficiency of the vertical climb of aircraft.

An electrical deicer for airplane propellers was devised of three layers of synthetic rubber, the center layer being an electricity-conducting rubber containing a continuous chain of carbon particles.

A large cargo airplane of stainless steel construction was successfully tested.

A "sky-hook," which causes packages to spin as they fall, was developed to make packages dropped from planes land almost directly beneath the point of release.

Use of new bonding material in the sandwich construction of airplanes made possible a light, inexpensive plane for private use.

The Black Widow, P61, large and most powerful long-range pursuit plane, was put into service for night fighting.

The Army's A-26 fighter-bomber, the Invader, was designed with an all-purpose nose that makes it possible to equip the plane on the production line with special devices in addition to standard armament.

A Navy blimp was equipped with reversible propellers which can be used as brakes.

The P-63, an all-metal, low-winged fighter plane with more power and greater range and speed than its predecessor the P-39, was developed.

An improved oxygen supply system, developed for aircraft, utilizes a regulator controlled by atmospheric pressure which automatically delivers increasing quantities of oxygen to the mask as the pressure decreases.

A water injection device was developed to give an extra burst of power to an airplane engine.

A light-weight passenger seat for aircraft, saving over 157 pounds of weight in a 24-passenger plane, was developed.

A self-propelled aircraft electric generator power plant, mounted on a three-wheeled scooter, was developed to speed the starting of airplane engines.

Red-lighted instrument panels, a military development



Ships and harbor installations burning in Manila Bay during the U. S. Navy attack on 13 November 1944.

to prevent interference with night vision, were installed in commercial planes.

The performance of the big, heavy single-engine P-47 thunderbolt fighter was improved and its radius of operation increased.

A high-frequency, all-direction radio range, believed to be static-free, and which enables a pilot to select and course toward or away from it, was developed.

Stall-warning devices for private airplanes were perfected.

Giant eighteen-foot hollow steel airplane propellers satisfactorily passed service tests.

By impregnating wood with methylolurea in water solution, it was found possible chemically to convert soft woods into much harder grades.

A continuous polymerization process was developed to replace the older batch type of synthetic rubber production, making possible an estimated 40% increase in output.

Milling time was cut by a new method of mixing carbon black with synthetic rubber in the liquid state instead of later.

An electronic device which registers the speed of flight of ammunition accurately to 1/100,000 of a second was developed.

A new family of synthetic resins, called silicones, for waterproofing and fireproofing materials, was produced by combining slippery organic compounds with the gritty components of sand and glass.

Pilotless jet-propelled planes carrying large explosive charges, nicknamed "buzz-bombs" and "robot bombs," were used by the Germans in long-range attacks.

The V-2 stratosphere rocket, a spinner using nine tons of fuel and carrying one ton of explosive, was developed to

follow a parabolic trajectory that has its peak 60 miles up and a top speed of 1,000 to 3,500 miles an hour.

Midget M2 fog generators were used to produce a concealing white cloud in warfare.

Rockets, known as flying bazookas, were discharged from tubes placed under the wings of warplanes.

Fuel tablets, made of a synthetic compound known as trioxane were developed to heat food for soldiers.—*Science News Letter*.

### Oil Incendiary Bomb

A terrifying new six-pound oil bomb, known as the M69, is credited with creating a fire that all but destroyed the northwest section of the city of Changsha, China, now occupied by the Japanese, the first time it was put into use, last July.

Landing in the streets and on rooftops, the bomb spits chunks of flaming oil up to twenty-five yards in all directions. These flaming chunks of oil cling to the surface of whatever they strike, making them one of the most effective fire-starters developed in this war. The glow against the sky above Changsha was visible to Army Air Force pilots for eighty miles, and columns of black smoke could be seen rising more than half a mile.

The new fire bomb, developed by the Chemical Warfare Service, consists of a slender six-sided steel case nineteen inches long and no bigger around than a baseball bat. The center portion of the cylinder holds a cheesecloth sock containing about three pounds of gasoline blended with a thickening compound. This mixture looks like orange gelatin, and it burns at a temperature of about 3,000 degrees Fahrenheit.—*Science Service*.

## Science Shorts

### INVISIBLE SEARCHLIGHTS

Ultraviolet screens of dark purple glass now filter all light which is visible from searchlight beams. The screen operates at so high a temperature that it must be constantly air-cooled. The complete cloud-height-determining system, which consists of a ceilometer, light projector and special recorder, was designed by the United States Weather Bureau in conjunction with General Electric illuminating engineers. The invisible beam is shot up to the cloud base by the projector. The ceilometer, actually a photo-electric scanning device, indicates the location of energy reflected from the cloud base. The ceiling height is then computed by triangulation.—*New York Times*.

### WATER STORAGE TANK

To provide combat troops in the Pacific with an adequate supply of pure drinking water, a new type water storage tank made of glass fabric coated with synthetic rubber, has been developed by United States Rubber Company working closely with the Corps of Engineers of the U. S. Army, and is now in production in four of the company's plants. Advantages are that it is not affected by rot or mildew, resists fungus growth, is light weight, extremely strong and durable and completely watertight.—*Military Engineer*.

### DANDELION RUBBER

The B. F. Goodrich Company of New York and the Goodyear Tire and Rubber Company of Akron, Ohio, have announced that they are producing tires from the latex secured from the Russian dandelion—kok-sagyz. These tires appear to equal Hevea tree rubber tires in quality. The supply of tires made from the so-called dandelion is limited in quantity, but it is anticipated that a larger supply will be available next season.—*New York Times*.

### WHOLE BLOOD FOR PACIFIC

Wounded men on hospital ships in the mid-Pacific and in the Philippines can now have transfusions of whole blood as a result of new methods developed to keep the blood fresh in its long journey from the West Coast, the Navy Department has announced.

The whole blood will be flown daily by the Naval Air Transport Service from San Francisco to Pearl Harbor and then on to island bases close to the fighting fronts.—*Science News Letter*.

### TURBINE LOCOMOTIVE

The first American-built locomotive powered by a steam turbine, instead of cylinders, pistons and driving rods, has been completed and is now under service tests on the Pennsylvania Railroad, for which it was designed and constructed. It is a giant in size, and is a coal-burning engine of direct-drive steam-turbine type.

The new giant is 123 feet in length and weighs nearly 500 tons. The turbine is designed to develop 6,900 shaft horsepower, providing power at the tender coupler sufficient to pull a full-length passenger train at 100 miles an

hour. The boiler is of the conventional type, carrying 300 pounds of steam pressure and fired by mechanical stokers. The steam travels through the entire battery of turbine blades, expending all of its energy except approximately fifteen pounds.—*Science News Letter*.

### INSULATORS

Stearite, the mineral twin-sister to ordinary face powder and after-shave talc, has gone to war against the Axis, baked into intricate forms and shaped for use as insulators on electronic communications equipment, the War Department reports.

Within the past year a new manufacturing process has been perfected that permits the non-metallic mineral to be baked as a ceramic into intricate forms and shapes, some of them so tiny as to seem almost microscopic. Tubes of baked stearite can be made as thin as an ordinary shipping nail, yet are capable of having a thinner wire inserted. These tubes can be bent at the sharpest angles, yet are hard and enduring, and cannot be injured by acids or intense heat.—*Science News Letter*.

### CALIBRATOR

New electronic equipment in the hands of ballistics experts of U. S. Army Ordnance increases the accuracy and extends the battle usefulness of American heavy artillery.

The new equipment, mounted on 2½-ton trucks, is capable of measuring the speed of projectiles that must hit targets up to 17 miles away within a time tolerance of a hundred thousandth of a second. It helps solve complicated problems involving such factors as the age of the gun, quality of ammunition, curvature of the earth, wind velocity, temperature and barometric pressure, enabling Ordnance men promptly to calibrate all types of heavy artillery weapons.

Seven Ballistic Service Teams are now overseas, with more contemplated. The Teams are composed of experts in operating the new equipment. One noticeable result of their work has been the decreased demand for new gun tubes—one particular Field Artillery gun was found to have almost double the active life at which it was rated. A Ballistic Service Team found that the guns were still shooting accurately at 12,000 rounds, where before they were considered unserviceable at 6,000 to 8,000 rounds.—*Science News Letter* and *Firepower*.

### British Fleet to the Pacific

Canberra, Dec. 14.

Mr. Makin, Minister for the Navy, today announced that 3,000 artisans have been allotted to help in the servicing, repair, and maintenance of the British Pacific Fleet throughout the engineering establishments and dockyards at Sydney. He added that the Government had made every possible preparation for the reception of the Fleet. Sydney's new graving dock, capable of taking the largest ship afloat, would be ready in ample time to service the fleet. The necessary workshops would be completed in February.—*London Times*.



Signal Corps Photo

Infantrymen land at Mindoro, one step closer to Corregidor.

### Note from an Ally

England  
Nov. 26, 1944.

Gentlemen:

Our very best thanks to you for sending a check for the article "Coast Artillery Action in Norway."

It was quite unexpected, and personally I cannot accept any payment for this article for which I have no more responsibility than as a collector of facts from different sources, but I have sent the check to our Coast Artillery Unit, whose personnel will decide whether to donate the money to some Norwegian fund or send it back for other use by the COAST ARTILLERY JOURNAL. You will hear from the Coast Artillery Unit directly.

With my appreciation of your fine work, and  
With my best thanks

Sincerely yours,  
BRYNJOLF BJORSET,  
Captain, Norwegian Army.

### POW Mail

Transmission of letter mail to and from American prisoners of war in Germany and Japan will be expedited as a result of the cooperative assistance rendered the United States Government in this regard by the Governments of Sweden, Switzerland and the Soviet Union.

In the case of American prisoners of war in Germany, arrangements have been completed with the Swedish and Swiss Governments whereby prisoner-of-war mail destined for American soldiers in German prison camps will be dispatched by air on alternate routes via Sweden and Switzerland following its arrival in the European Theater of Operations. This two-way shuttle service over these two alternate routes will considerably reduce the transit time for these mails which will be dispatched from the United States to Europe direct by air on a daily schedule.

A portion of the prisoner-of-war mail addressed to American prisoners in Japan will, effective at once, be carried on Soviet ships leaving west coast ports as a result of instructions issued to Soviet ship captains by the Soviet Government advising them to accept prisoner-of-war mail from

United States postal authorities for dispatch to American prisoners of war held by Japan. This mail will be transported across the Pacific to Soviet ports and thereafter transferred to the Japanese for delivery to prisoner-of-war camps.

This latter service supplements that already in effect whereby prisoner-of-war mail to Japan is transported by air to Iran and transhipped from that country to Japan.



### Other Subscribers Please Copy

Next to a quick victory, more articles from the fighting fronts, and more subscribers, what we want most are more letters like this one from Captain Fred D. Waters, who writes, "No doubt from time to time my APO address will change but I will take the necessary precautions to notify you if it should."



### Consolidation of Defense Commands

The Eastern Defense Command absorbed the Southern Defense Command 1 January. The Central Defense Command had been consolidated with the Eastern Defense Command on 15 January, 1944. The Eastern Defense Command now includes the entire country except the eight states in the Western Defense Command, which are: Oregon, Washington, Idaho, Montana, California, Nevada, Utah, and Arizona.



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Time is wasted and tires are damaged by irons that do not have this safer, better tire iron. Requisition now if you do not have IRON, TIRE, Military Type, Federal Stock No. 42-1-174, which is authorized (2 per tool set) by SKL G-27 and G-367.

## MAKES TIRE CHANGING EASIER


## STOPS DAMAGE TO TIRES & TUBES

### Hamilcar Glider

Two armored scout cars, or a jeep and a Universal Carrier, or a 25-pounder gun, or even a self-propelled Bofors antiaircraft gun can be carried in a Hamilcar Glider—the world's largest wooden aircraft—according to a British Air Ministry technical description released tonight.

A Tetrarch Mark IV Tank or an American Locust Tank or a complete scraper and tractor can also be carried in this mammoth craft, which played such an important part with the Airborne Division in Normandy on D-day.

By the use of wood and special construction, the Hamilcar can carry almost its own weight of useful military load. It weighs 36,000 lbs. fully loaded, of which 17,500 lbs. represents the load.

With its nose opening to form a huge door, the Hamilcar is able to discharge its cargo in record time after landing in hostile territory. Just before landing, armored vehicles carried in the glider are started up and engines are kept running till the glider lands. Within fifteen seconds of the aircraft coming to rest, they can be driven out without any special ramps or equipment.

Special arrangements are made to pipe the exhaust gases from the vehicles out of the aircraft while the engines are warmed up, and an ingenious system of quick-release anchors frees the vehicles with one pull on a lanyard as the glider touches down.

Only the most powerful four-engine bombers can tow this huge glider and Halifaxes were mainly used for this purpose. Even so, the weight of the glider had to be kept to the minimum.

### Marine Corps Ingenuity

By Staff Sgt. Ward Walker, Marine Combat Correspondent

After helping to blow the Japs foot by foot into their final stronghold on Peleliu, Death Valley, Marine Second Lieutenant Clinton E. McKnight conceived and executed a plan in the closing stages of the campaign that made the Japs' last hours uncomfortable.

Death Valley, a natural amphitheater roughly the size and shape of Soldiers' Field in Chicago, Ill., is protected by sheer coral ridges. The Japs, holed up in their deep caves, couldn't be reached by flat trajectory artillery fire, bombs or mortars. They stopped all infantry attacks with a withering crossfire from the caves. As a result the action dwindled into a rifle duel between the Marines on the 150-foot high ridges and their well-protected enemies.

Although Lieutenant McKnight and his platoon of combat engineers had spent nearly a month in the line as infantrymen, blasting a total of twenty-five caves containing more than 200 Japs, he was on the lookout for a chance to do some engineering. He found it.

Scouting the top of the valley's eastern ridge, he found a small table extending about ten yards. It was so situated that an artillery piece there could command virtually the entire western slope of the valley.

The problems in the way were getting a 1,300-pound gun up a sheer wall, digging an emplacement on the table top under sniper fire and finding a way to supply the gun and crew.

Lieutenant McKnight conceived the idea late in the afternoon, got permission to go ahead that night and started work at dawn the next morning. By noon the gun was firing, point blank into caves that heretofore couldn't be touched.

The engineers dodged sniper bullets to plant heavy charges of TNT in the coral of the table top. They blew a hole for the emplacement and finished the work with hand shovels.

They anchored one end of a cable around a coral pinnacle, the other around a "dead man"—a telephone pole sunk in the ground. They rigged a block and tackle, hooked onto a truck winch and were ready for the gun.

Slowly they moved the heavy, delicate piece of lethal machinery up the slope, worked it past the bulges and holes. The last few feet they had to move it with muscle into the emplacement.

Next came the matter of supplies. They rigged a huge tripod at the foot of the ridge, ran a line from it to the top and drew it tight. They swung a stretcher basket from the line, fixed another block and tackle, used the truck winch for power and they had a "flying fox."

Lieutenant McKnight crawled along the ridge until he could watch the first shot of the gun which sent a shell whistling into a big cave.

"Wham!" the lieutenant said. "That sure beats a Garand all hollow!"

### M-1 Wrinkle from the Marines

CAMP MATTHEWS—A simple six-step process of replacing broken firing pins in the M-1 rifle which requires only one-third the time of the conventional method has been devised by Platoon Sergeant Robert Lee Hudson, now on duty in the camp armory.

The new method compares with sixteen steps in the old process and requires only an empty cartridge case and new firing pin as tools. Removal of the stock and extractor is the only dismounting necessary.

Platoon Sergeant Hudson, a veteran of 15 years' service, claims that under field conditions it takes only about 60 seconds to replace broken firing pins using the new method. With brief instruction on both methods, he reported, recruits completed the job in three minutes using the new system and in ten minutes the old.—*The Chevron*.

### POW's in U. S.

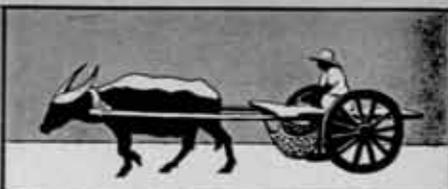
There were 361,631 prisoners of war held within the continental limits of the United States as of January 1. Breakdown as to nationalities follows:

German .....	307,931
Italian .....	51,071
Japanese .....	2,629

The Provost Marshal General's Office stated that the prisoners were held at 130 base camps and 290 branch camps located in all sections of the United States. The branch camps are designed to place prisoners near current work projects.



# 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 Headquarters is part of the quarter.

The of trips the past mornin to Fort rolled o few mir Wint i work of of all ex time of Hultqu F. W. when tl down w they m; boat. E kept aff before t By slow while, 1 our cwi missing beach t and a sr have no busy ro A me gaged i regimet

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

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## Guadalcanal to Lingayen Gulf

- Guadalcanal - 7 August 1942
- New Georgia - 30 June 1943
- Finschhafen - 3 October 1943
- Cape Gloucester - 30 December 1943
- Green Islands - 16 February 1944
- Manus - 15 March 1944
- Hollandia - 22 April 1944
- Schouten Islands - 27 May 1944
- Saipan - 14 June 1944
- Tinian - 23 July 1944
- Paulau - 14 September 1944
- Morotai - 15 September 1944
- Leyte - 20 October 1944
- Mindoro - 15 December 1944
- Luzon - 9 January 1945

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

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

back are



## The Coast Artillery School

BRIGADIER GENERAL L. B. WEEKS, *Commandant*

In line with the policy of incorporating as much practical work as is possible into its courses, the Department of Artillery initiated a greatly enlarged Target Practice Analysis Conference Series as an experiment with the last Officers' Advanced Course class. Improper analyses of some practices which have been received by the Department's Target Practice Review Section have indicated a need for the additional instruction according to Major E. W. Kaiser, head of the Section. In the new Conference Series the student obtains all records and data from an actual 155mm service practice and prepares an analysis of the practice from beginning to end. The results of the first series were sufficiently encouraging to have a similar set of conferences included in the schedule for the new Officers' Refresher Course which is replacing the Officers' Advanced Course. In connection with Target Practice Analyses it is pointed out that Changes No. 1 to TM 4-235 *Seacoast Artillery Target Practice*, are now printed (most units should be supplied by this time) and the Changes contain many items which will be of interest to firing batteries. Some of the most important items are the following:

1. In Chapter 1. *General*.—The responsibilities of the Sector or corresponding commanders in regards the general conduct of target practices have been increased and the minimum time limit required between practices has been reduced considerably.

2. In Chapter 3. *Seaward Firing*.—Several changes in the instructions for using the various analysis forms are made to clarify the computations and calculations. Forms covering the analysis of target practices fired using the gun data computer of the M8 type are included. Additional information is required in the Battery Commander's Report, Form No. 30, to aid higher commanders in making their own analyses. New Forms No. 30 are available with space provided for this additional information. However, the old Form No. 30 is readily adapted to include this and may be used until the supply on hand is exhausted. The new Battalion Commander's Indorsement, Form No. 31 no longer requires that ratings be given and Battalion Commanders are being given more freedom in presenting their picture of the practice as completely as possible.

3. In Chapter 4. *Antimotor Torpedo Boat Weapons*.—Safety provisions have been altered allowing for more maneuverability in courses in both 90mm and 40mm firings using the JR boat under remote control. Hit expectancy tables have been added for all AMTB weapons to aid commanders in judging the results obtained in firings with these weapons. Instructions regarding the firing of regular and special target practices with 90mm weapons are in-

cluded to aid commanders in imparting the maximum realism into practices with this weapon. A special form for the tabulation of the results of 90mm firing has been added to aid battery commanders in presenting a clear picture of the practice.

4. In Chapter 5. *Landward Firing Target Practices*.—Since some reports of landward firing have been lacking in details essential to an understanding of the results, certain other information is to be included in the Battery Commander's Narrative Report.

5. In Chapter 6. *Submarine Mines*.—An actuation has been included as a part of all target practices by submarine mine batteries in addition to the usual test and firing phases.

6. In Chapter 7. *Seacoast Searchlights*.—The chapter on seacoast searchlights has been added to aid the harbor defense and higher commanders in determining the efficiency of the searchlight units under their control. It is also felt that this type of practice will advance the training of searchlight units by giving them a goal to attain similar to the firing batteries.

The School is very proud of the new equipment now installed for the Enlisted Diesel Course. The installation of this equipment and preparation for the Diesel course were under the close supervision of Lieutenant Colonel H. A. Maxfield, Assistant Director, Department of Engineering. One plant consists of two 187.5 KVA generators driven by two Buckeye modern Diesel engines and accompanied by all the auxiliary equipment such as switchboards, compressors, pumps, evaporative coolers, etc. This permits very practical training for Diesel engine operators in the operation of the new Diesel power plants for gun batteries. This plant was installed by personnel of The Coast Artillery School under the direction of Major Robert B. Pitts, senior instructor of the Diesel course, and this plan represented a great saving in time and expense to the School. Another new unit is the Caterpillar Diesel Engine recently installed in Lewis Hall.

On 18 December 1944, the Coast Artillery School graduated Class No. 7, the largest class of Diesel Power Plant Operators since the inception of this course in March 1944. This largest class attained the highest class average and had the greatest opportunity to use this new equipment of all the classes to date. In this course, four weeks are devoted to electricity with special emphasis on the electrical units and the switchboards of these Diesel power plants. Six weeks are devoted to the engines, their care, and preventive maintenance including one entire week of training on the actual operation of Diesel power plants. The



Diesel Laboratory, Coast Artillery School.

training includes a specified procedure for checking all units, valves, instruments, supply and lubricating lines, each step in starting and shutting down units, synchronizing and the operation of the entire switchboard. Lacking an approved Operators' Log, the course has supplied and trained the students on a simplified form. Load runs and exercise of plant are practiced employing a water rheostat to load the units.

Under the new system of coordination between the various departments of the Coast Artillery School, the students in the Master Gunner Course have had some interesting opportunities to perform some phases of their work in connection with the Officers' Advanced Course. One morning was spent out on a target-towing tug taking records of a firing by using cameras, range rakes, and the new TVS Recorder. (The TVS Recorder has now been entered in the course as part of the regular instruction.) A special detail of students spent two days at Camp Wallace, Virginia, determining Orientation data as an advance preparation for the Officers' Advanced Course Firing problem. Later the whole class worked at Camp Wallace preparing Orientation data for gun sites and fire control sites that will be used in connection with the newly formed Officers' Refresher Course. The work at Wallace required sun observations, transit traverses through the woods, and Plane Table work. In addition to the field work, the students did all the computations in connection with the work. All in all, the whole experience was a good practical application of the work they perform in the classroom. Captain Jacob Miller and Technical Sergeant Robert D. O'Brien have been in charge of this work.

On the 12th of December 1944 the Enlisted Communication Course furnished the radio communication for the Officers' Advanced Course at Yorktown during their mapping and reconnaissance problem. On the 29th and 30th of December, the class furnished communication again for the Officers' Advanced Course at Fort Eustis. They returned just in time for graduation. The instructors were Captain C. V. Grier and WOJG J. W. Adams.

On the 14th of December 1944 the Enlisted Communication Course put on demonstrations in radio-telephone net operation and emergency fire control net operation for the Officers' Advanced Course. They also had a display of Coast Artillery radio equipment and training films on transmission security.

Submarine Mine Officers' Course No. 16 graduated on 25 November 1944. The Enlisted Students who enrolled in Mine Maintenance Course No. 11 on 28 October graduated 3 February 1945. In addition to these regular courses, the Department of Submarine Mining conducted Target Boat Course No. 4 which completed its work on 18 November 1944. There were seven Puerto Rican students in the class.

A comprehensive booklet entitled *Notes on Operation and Maintenance Submarine Mine System Using Emergency Mine Control M4* was recently printed at the Coast Artillery School after having been prepared by the Submarine Mine Depot. Copies of these notes have been mailed to all Harbor Defenses with mine projects. TM

9-405, *Operations and Maintenance, Submarine Mine System M3* is expected off the press in the near future. The Department of Submarine Mining is now studying proposed revisions to Army Regulations 90-150, *Army Mine Planters, General*; 90-155, *Assignment, Control, and Use of Army Mine Planters*; and 90-160, *Small Boats*. Suggestions have been solicited from the field in regard to changes or additions indicated by local experience.

A "Puff Range" for training forward observers in landward firing has been installed under the direction of Captain Hubert V. Davis, Training Officer. The target area, 600 yards by 210 yards, is marked off in 30-yard squares. At each corner of the square black powder charges are set off electrically from a central control switchboard. Corrections are sent to the switchboard by radio from the forward observer. The observer calls for a correction after each "burst" by estimating the deviation from target. This training is most realistic and has been incorporated in the Officers' Refresher Course which began 6 January 1945.

The Coast Artillery School is preparing changes to FM 4-5, *Coast Artillery Tactics*, FM 4-10, *Coast Artillery Gunnery*, and FM 4-15, *Coast Artillery Fire Control and Position Finding*. These changes are based on (1) numerous reviews from various Sectors and Defense Commands directed by Army Ground Forces, (2) trips which School officers have made to various harbor defenses, and (3) informal requests for information from officers in the field. In this respect, one query from the field asked for clarification of the information now contained in FM 4-15 on opening fire at full rate. The School's answer to this inquiry was as follows: "It is believed that FM 4-15, dated 5 November 1943 (par. 157 and the note to par. 154) places emphasis in the wrong place. Opening fire at full rate will be effective only when the battery is in a well established position from which it has previously fired and is provided with a dependable range finding system and meteorological message. Since all of these requirements are seldom met in 155mm batteries, trial fire rules will normally be employed." Most inquiries of this nature will be extremely beneficial in the preparation of future changes not only to the manuals just mentioned, but to any manuals for which the Coast Artillery School is responsible. It is hoped that JOURNAL readers will contribute any information of value in this respect.

During the month of January the following publications have been printed and distribution initiated: FM 4-61, *Service of the Piece, 16-inch Gun Casemated*; C1 to FM 4-20, *Firing Preparations, Safety Precautions, Care and Service of Matériel*; C1 to FM 4-48, *Service of the Piece, 8-inch Gun Mk. VI, Mod. 3A2 on Barbette Carriage M1*; In final review at Army Ground Forces Headquarters are the following Coast Artillery publications: FM 4-7, *Tactics and Technique of Controlled Submarine Mines, Ground*; War Department Training Circular, *Radio Sets SCR-808-( ) and SCR-828-( ) for Emergency Transmission of Base-End Data—Employment and Assignment of Frequency*; Coast Artillery Training Bulletin, *Coincidence Range Finding*; and Coast Artillery Training Bulletin, *AMTB Defense Training Exercises*.



# Fort Bliss



BRIGADIER GENERAL STANLEY R. MICKELSEN  
Commanding AAATC

By Major Paul V. Meyer

The AAATC Gun Section, in an effort to add realism to 90mm and 120mm Service Firing is devoting one day of each week to a program of surprise missions. Targets are brought in unexpectedly and designated units are required to fire on them.

One battalion is required to establish an AAOR to coordinate the schedule of surveillance equipment and location of OP's of the various units participating to provide warning of the approach of aircraft. All targets plotted on the AAOR board are identified as either hostile, unidentified, or friendly by a check with the Director of Fire, who is a representative of the AAATC. The Director of Fire is the only one who knows the schedule. His duty is to establish radio contact (frequency restricted) with the target, to direct the target on a course suitable for firing, and to identify the target only upon AAOR's request. Having

identified the target, he notifies the Operations Officer when the field of fire is safe and when the Records Section is on the target.

When the Operations Officer is notified that the target is enemy, he immediately alerts all batteries. When clearance has been obtained from the Director of Fire, the Operations Officer directs the fire of his batteries, limiting fire to one battery at a time in order that firing may be scored by the Records Section.

Targets are brought in from all altitudes and directions in order to avoid detection. The use of equiangular targets for this program makes possible multiple targets, jamming more frequent targets, and more deceptions as all planes are potentially hostile. A special target for direct fire action by gun crews can be utilized at the same time a simulated high level bombing attack is being carried on.

The drop in the accuracy of fire indicates a serious need for this type of training.

Gun firing records, to be effective, must be available to the battery firing before the next course is fired. Competition and interest is stimulated if the battery like the rifleman knows whether they shot a three, four, or a bull's-eye. To accomplish this, the records section of AAATC has devised a high speed streamlined method of computing scores.

Weekly averages of each battery's firing are maintained to illustrate the unit's progress. The scores also assist in high lighting gunnery errors. A course with a score below 50 is considered as evidence of gross errors. A battery firing a course below 50 is not permitted to fire for several hours, but is required to investigate, determine and correct their error. A full report by the battery as to the error, its cause and corrective action is forwarded to the Records Section. This procedure has materially improved the shooting by gun organizations. It is similar in reaction to that of an

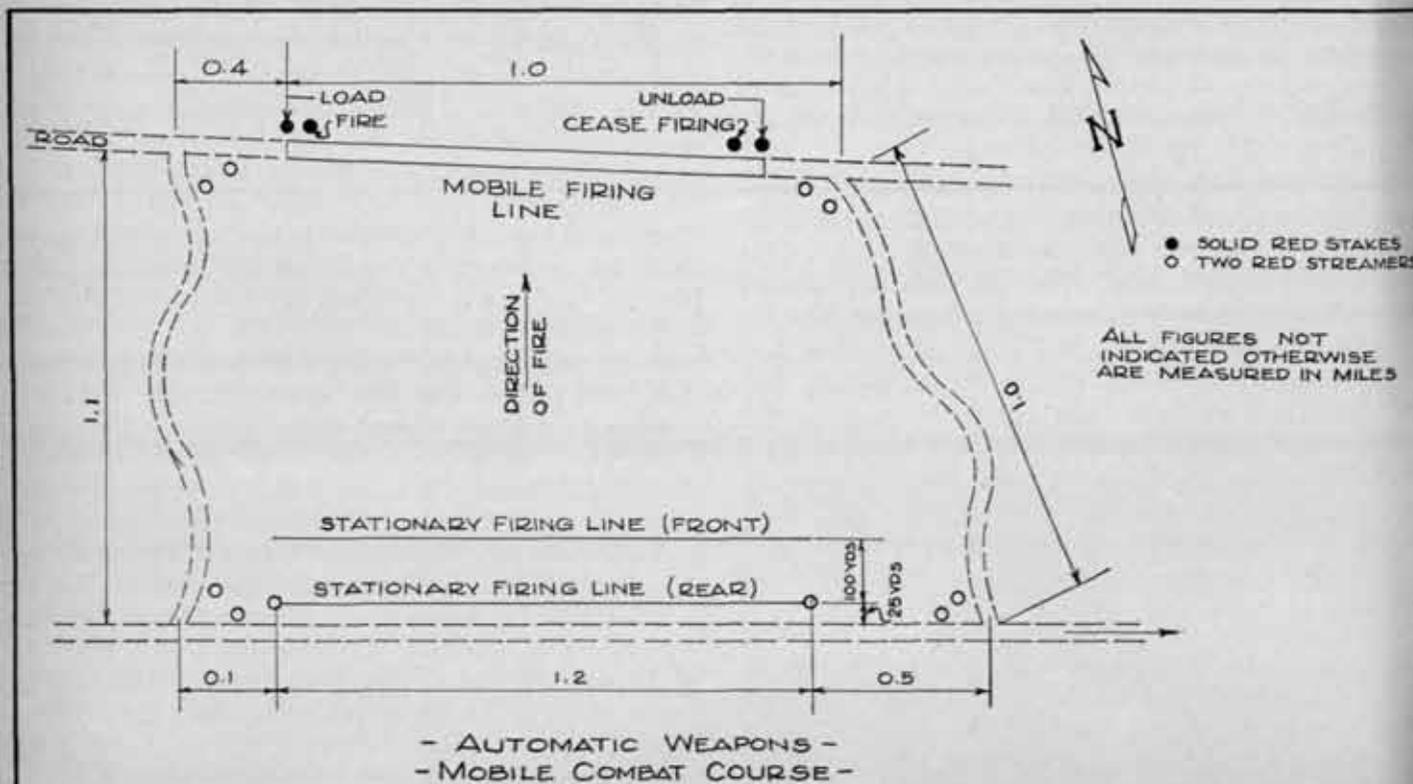
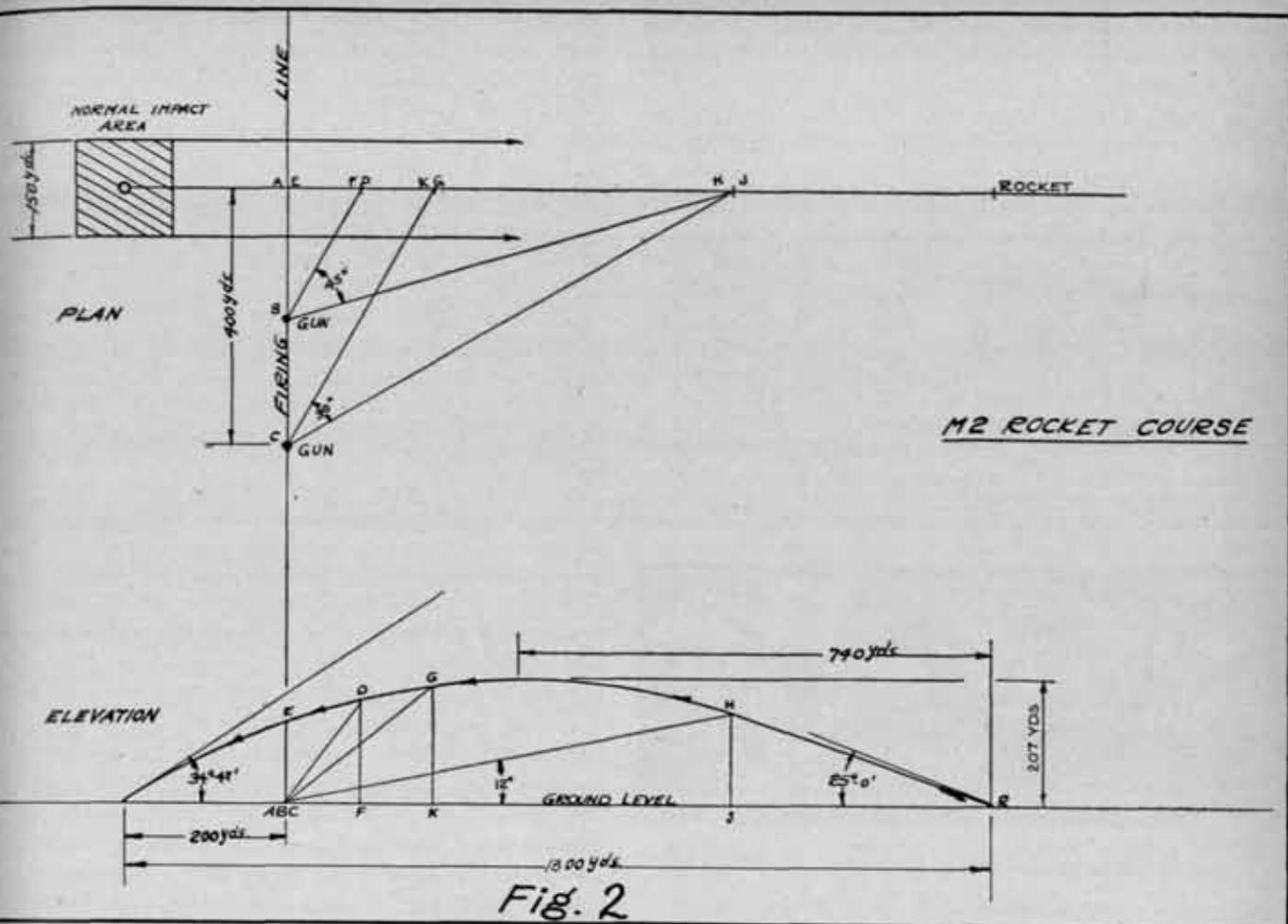


Fig. 1



athletic team; the individual who is responsible for the error feels that he has let his team down.

The AW Section introduced some time ago an innovation in the nature of a mobile combat course for all AW and MP battalions which has proven highly successful. This is in addition to the many varied required fire tests in the regular ATP. The purpose of the course is to afford these units an opportunity to get into action while on the move and at a halt in convoy. It is designed to offer difficult driving through high and irregular sand dunes and a fire test that simulates as closely as possible actual combat conditions that demand alertness and accuracy of each member of the crew in the execution of drill and firing under duress.

The course laid out is rectangular (see sketch No. 1). The firing section of the course is a mile in length. All units upon approaching this part of the course are given the command to "load" and "commence fire on any target" by markers on the firing side of the road. All M-15, M-16, M-32, and M-51 mounts are fired on the move and also at a halt, whereas the 40mm cannons of an AW unit are fired only at a halt and from the wheels. The 40mm fire units are prepared for emergency action in accordance with Par. 69, FM 4-160.

The length of the firing section of the course was fixed to allow a complete battery on the line at a time at normal convoy interval. Air Guards are forewarned to look for a yellow flare at which signal the convoy halts and the 40mm cannons made ready to fire at the Chief of Section's command "Action from Wheels." Prime movers are driven off

the road into the safe field of fire during this phase of the fire test. Upon observing a green flare, "March Order" is given and the convoy then moves on, allowing another battery onto the firing line. Firing from multiple gun mounts and M-32's continues, however, until the "Cease Firing" marker is reached. Air Guards must be alert and on the job to keep the exercise going. Targets utilized in this test are rockets. Towed flag targets No. 6A have also been utilized but did not sufficiently enhance the effectiveness of the test to warrant continued use.

The units are scored on the following: convoy discipline, accuracy in drill, voice and command under firing conditions, rapidity of getting into action from the wheels and the execution of "March Order," accuracy and effectiveness of firing, ability to change targets, which have priority, and vice versa, engagement of targets within range, observance of safety precautions and discipline of personnel during the entire test.

It requires a team of five men to run the test. The team is composed of a chief umpire and four assistants. The results have proven extremely worthwhile. The enlisted men learn well the value of complete knowledge of drill and are given an opportunity of developing their own initiative under fire. In several unit tests, of an hour and one half, as many as three targets have been shot down, and many Cal. .50 hits obtained.

The success of the course depends upon complete coordination between the S-3 section and the Battalion as well as the thorough dissemination of instructions for the

running of the test to the respective fire units. All instructions are issued to the battalion verbally one day before the test is conducted.

The Rocket Target M2 has been tested on a course which resembles a diving, strafing course for automatic weapons. The rocket is fired from a point 1,100 yards toward and perpendicular to the firing line with an elevation of 25 to 30 degrees. Tests reveal that the maximum lateral dispersion, due to normal ballistic conditions, is 75 yards based on a normal impact point of 1,400 yards range. (See figure 2.) However, the dispersion in range is not dependable because of the unreliability of the rocket charge. It is possible, in a defective charge, that the rocket will fall at a range as small as 100 yards at 25-degree elevation, and may vary up to the maximum range. For safety measures, guns are placed 200 and 400 yards, on the firing line, on each

side of the rocket course. Placing a gun 200 yards on the firing line on each side of the rocket path, firing can be conducted on a course of about 600 yards through a horizontal angle of 45 degrees. If guns are placed 400 yards on each side of the rocket path, on the firing line, such guns can fire on a course of approximately 470 yards through a horizontal angle of 30 degrees. (See figure 2.) Such a presentation of the M2 rocket target to the gunner offers a very suitable approximate incoming, diving and strafing.

The Air Liaison Section of the Training Center recently arranged with the 16th AAF Wing, Biggs Field, Texas, for two multiple plane heavy bombardment missions. The first of these missions consisted of a formation of fifty-two B-17's and B-24's, and the second of thirty-four B-18's and B-24's.



BRIGADIER GENERAL EVANS R. CROWELL, *Commandant*  
By *Captain Herbert B. Warburton*

Brigadier General Evans R. Crowell, former Commanding General, 65th AAA Brigade, Camp Haan, California, assumed command of the Antiaircraft Artillery School on December 4, 1944.

First Lieutenant Frank B. Aycock, Jr., received the Legion of Merit award on November 10, 1944, at Retreat ceremony conducted on Noels Field by the 20th AAA Group, School Troops.

Assigned as an instructor in the Automatic Weapons Department of the Antiaircraft Artillery School from October 1, 1943, to August 10, 1944, Lt. Aycock voluntarily and of his own initiative conducted research which resulted in a major contribution to the development of the down-course method of spotting tracer fire, and the adoption of a new standard of proficiency in emplacing and firing the 40mm fire unit. An article by Lt. Aycock on the result of his research was published in a recent issue of the *COAST ARTILLERY JOURNAL*, and reprinted in the *Marine Corps Gazette*.

In compliance with War Department policy of conserving man power in domestic installations, the School recently modified its administrative and instructional organization. In a consolidation removing the Division of Instruction from the organizational chart, direct supervision of all instructional activity now rests with the Assistant Commandant. The S-3 Operations Section is charged with Air Liaison for target missions, scheduling of classes, troop requirements, and firing range schedules, all functions previously performed by the Operations Section of the Division of Instruction. Other changes in the instructional

organization include shortening of the duration of courses, with an intensification of instruction, and a utilization of department administrative officers as instructors during normal duty hours.

From the administrative standpoint, the Division of Training Publications, charged with the preparation of Antiaircraft Artillery training aids, including manuals and films, now occupies the status of a department under organizational control of the Assistant Commandant. The new department is now known as the Training Literature and Visual Aids Department, under the direct supervision of Colonel Maurice Morgan, who recently joined the Staff and Faculty of the School from assignment with the Antiaircraft Artillery Replacement Training Center, Camp Hulen, Texas. To secure the most efficient use of civilian employee personnel, stenographic pools have been established, where survey indicates this course to be warranted to perform work of a clerical nature for individual departments or groups of departments.

A recent innovation in the School is an Instructor Course designed to keep the efficiency of School instructors at highest peak. The course is so designed that an instructor who feels his method of approach and delivery can be improved, may voluntarily request criticism of his lectures by officers with public speaking and teaching experience. The course includes recording of the lecture through each phase of the period of criticism to permit analysis of faults and to indicate progress.

Recent visitors to the School to observe training methods and use of matériel are Lieutenant Commander Dee C. Blythe, Naval Operations of the Navy Department, Washington; Lieutenant Colonels Perry F. Wendell, Arthur G. Kiel, and Robert L. Brown, of the Coast Artillery Corps; and Major Charles L. Butler, of the Air Corps, representatives of Panama Canal Department installations; and Captain Albert G. Carrins, of the Australian Military Mission.

On December 14, 1944, more than two hundred soldiers of the 643d AAA (AW) Battalion, 20th AAA Group, received First, Second, and Third Class Gunners qualifications, and Good Conduct Ribbons. The presentations were made by Lieutenant Colonel Ben Ferguson, Commanding Officer, on the Battalion's area parade ground.

# Southeastern Sector

MAJOR GENERAL DURWARD S. WILSON, U.S.A.,  
Commanding

Despite the trend of the war news in European and Pacific theaters, there has been no relaxation of the training program in units of the Southeastern Sector.

At the Harbor Defenses of Chesapeake Bay, Brigadier General Rollin L. Tilton commanding, one of the most successful and beneficial training projects ever held took place November 15 and 16 when a Command Post Exercise involving regularly employed troops down to Battery CP's was carried out.

The problem involved attacks on the Harbor Defenses by submarines, motor torpedo boats and aircraft, all of which required considerable effort and planning prior to the execution. While prepared especially for testing communications, flow of intelligence, standard operating procedures and the reaction of personnel, the exercise took on the atmosphere of a full scale operation with the troops displaying unusual enthusiasm and spirit.

A critique conducted in the afternoon of the final day at Fort Story was attended by all Harbor Defenses Officers who took part. Several rough spots were ironed out but it was generally conceded that the exercise was excellent.

With the closing of the fourth quarter, practice period firings have been completed and indicate an excellent state of training in the entire Harbor Defenses.

One mine battery rounded out three full years of practice with a perfect record of hits for 1942, 1943 and 1944.

A résumé of the official practice records reveals that one battery equipped with dual purpose rapid-fire guns has destroyed nine seacoast targets and one antiaircraft. Three seacoast targets and two antiaircraft targets were badly damaged. Another battery firing single-purpose, rapid-fire guns obtained 18 bow-on hits and 17 broadside hits from 13 rounds fired. The actual center of impact of all shots fired was determined to be one and nine-tenths yards short and forty-five hundredths of a yard to the left of the center of the target.

The Christmas season found the Harbor Defenses of Chesapeake Bay well prepared for a happy and gay holiday keeping with wartime restrictions. The annual Christmas parties for children of the posts of Fort Monroe and Fort Story were declared to be huge successes.

A stepped-up Orientation program featuring a daily news bulletin with items on the progress of the war, which is delivered to each man in the batteries, has been instituted and expected to prove educational as well as entertaining. A complete outline for the units in the Harbor Defenses was worked out and each battery is conducting full hour classes.

At the Harbor Defenses of Charleston, Colonel L. W. Heppert commanding, an opportunity is being afforded Battery Officers who have never commanded a firing battery or acted as range officer, to participate in such operations. Each battery-grade Coast Artillery Officer is required to fire one sub-caliber and one 3" service practice, acting as Range Officer or Battery Commander. Each sub-caliber practice is analyzed and a standard target practice report is personally submitted for each service practice by the Acting Battery Commander.

A 3-day Command Post Exercise was held during No-

vember. Two night service practices were conducted under as near combat conditions as safety allowed. Targets were illuminated by searchlights. Two air raids simulated by Civil Air Patrol planes gave the antiaircraft searchlights some excellent drill against low flying aircraft. During the problem, eight enlisted men acted as saboteurs, keeping all units on their toes to apprehend these men. The best training resulted where the saboteurs were successful, bringing to light possibilities of sabotage not previously eliminated.

The assignment of Civil Air Patrol planes for exclusive Harbor Defense use has given an impetus to antiaircraft training and target practice. Several 40mm and .50 caliber machine gun practices were conducted. Numerous night missions were flown for searchlight drills.

At the Harbor Defenses of Key West, Lieutenant Colonel William P. Moore commanding, a 48-hour joint Army-Navy Maneuver was held between 27 and 29 November 1944. All Officers and enlisted men of the Harbor Defenses and many of the Officers and men of the Naval Operating Base, Naval Air Station and Fleet Sonar School participated.

The Navy Fleet Sonar School at Key West furnished eighteen vessels and formulated a coordinated plan of attack which they subsequently carried out against the Harbor Defenses. All attacks were theoretically repulsed with heavy losses on the part of the enemy. Similar attacks made against all Harbor Defense installations by forty-seven planes from the Naval Auxiliary Air Station at Boca Chica, Fla., were repulsed and many of the attacking planes shot down. Damage to Harbor Defense installations was comparatively light.

Navy planes made actual reconnaissance flights over Harbor Defense installations and took photographs from which the Navy formulated their plans of attack. The operations of the Fleet Sonar School were directed from the deck of their flagship, a destroyer, at sea. The operations of the Naval Aircraft consisting of patrol bombers, torpedo planes, dive bombers and fighter planes, were conducted from the operations room at the Naval Auxiliary Air Stations.

The maneuver which was incorporated into the training programs of both the Army and Navy forces, was divided into four phases: (1) Air reconnaissance during which actual photographs were taken, and AA batteries attempted to shoot down the planes; (2) Air attack, during which phase, all Harbor Defense installations were bombed and strafed. Flour sacks were used to simulate bombs; (3) Naval attack, during which 18 ships of the Fleet Sonar School moved on the shore installations simulating a full Naval engagement; (4) Land defense, during which a landing force consisting of a detachment from Headquarters Battery made a landing and attempted to infiltrate to Harbor Defense installations. They were met and repulsed by a mobile striking force which consisted of one platoon heavily armed and well equipped to meet the emergency.

The details of the maneuver were not divulged to anyone except the Commanding Officer and the Control Officers. It was treated as an actual battle throughout and no messages except those which reflected the current trend of the situations were transmitted. No unauthorized information leaks were permitted.

After the completion of the problem, a critique was held.



## Northwestern Sector

BRIGADIER GENERAL JAMES H. CUNNINGHAM, *Assistant Sector Commander for Harbor Defense Matters*

During the past two months, extensive command post exercises were held to test the state of training of units in the Northwestern Sector in matters of command, communications, command post operation, intelligence procedure, liaison with adjacent units and supply in the field. Under the direction of Major General Robert H. Lewis, Commanding General, Northwestern Sector, Western Defense Command, twenty-four hour command post exercises were held at the Harbor Defenses of Puget Sound on 12-13 November and the Harbor Defense of the Columbia on 21-22 November which tested the combat efficiency of the harbor defenses in defense against all types of attack. On 11-12 December a Command Post Exercise was conducted which tested all units of the Northwestern Sector, and selected military and civilian agencies. These exercises afforded excellent training to all units, including batteries who participated in each exercise. Results of the problems were covered at critiques which promptly followed each exercise.

Major Kirkpatrick-Crockett of the Royal Canadian Artillery arrived at Fort Worden on 14 November to award the Kirkpatrick-Crockett Trophy to the battery in the Harbor Defenses of Puget Sound attaining the best rating in its first regular target practice fired during 1944. This trophy was presented to the Harbor Defenses of Puget Sound by Major Kirkpatrick-Crockett in 1942 and since that time has been awarded annually. Presentation of the award this year was made by Major Kirkpatrick-Crockett at a battalion review held at Ft. Casey, 15 November. A picture of the presentation appears at the right.

Antiaircraft artillery training has been particularly emphasized in both harbor defenses during the past two months. Antiaircraft practices were fired by AMTB batteries in both harbor defenses. Automatic weapons units have fired on balloons, rockets, and other targets. Seacoast target practices are continuing to be held with special at-

tention being given to night practices, emergency methods of fire control, and surprise shoots.

Major General R. D. Alexander, DSO, Inspector General for Western Canada, accompanied by his aide, Major Mackinnon, and Colonel John H. Harrington, GSC, U.S. Army Liaison officer to Hq. Pacific Command, Vancouver, B.C., visited the Harbor Defenses of Puget Sound on 4-5 December and the Harbor Defenses of the Columbia on 6 December. Major General Alexander was formerly Commanding General, Pacific Command.

Seven officers and twenty-two enlisted men from the Harbor Defenses of Puget Sound and seven officers and eighteen enlisted men from the Harbor Defenses of the Columbia completed a four weeks Leadership and Command Training School held at Headquarters, Northwestern Sector, Western Defense Command, Fort Lewis, Washington. These officers and enlisted men are now instructing harbor defense troops in command training, American Battle Drill and related subjects, to further develop qualities of leadership in officers, noncommissioned officers and selected privates and to prepare small units, such as squads or platoons, for offensive battle as Infantry.

There is great enthusiasm in basketball and bowling in the harbor defenses of the Northwestern Sector during the winter months. Thirteen teams from the Harbor Defenses of the Columbia battle in two leagues, three nights each week, for basketball supremacy. A post team, made up of stars from the battery teams has a good record against college and service teams in the adjacent area. On the other nights for basketball, ten bowling teams are in action. In the Harbor Defenses of Puget Sound, the Fort Worden and Camp Hayden Football teams completed a most successful football season by playing each other on Thanksgiving day. Organized basketball and bowling leagues are now occupying the athletic spotlight.



Major Kirkpatrick-Crockett presents the Kirkpatrick-Crockett Trophy at Fort Casey.



# Do We Have Your Latest Address?



## Northeastern Sector

MAJOR GENERAL FULTON Q. C. GARDNER, *Commanding*

Several experimental firings were conducted during the last two months by the Harbor Defenses of Long Island Sound to determine the efficiency of the various types of projectiles and fuzes available for 90mm guns when used against Naval Targets. A critique of these firings, conducted by Colonel D. B. Greenwood, Executive Officer, Harbor Defenses of Long Island Sound, was attended by Major General Fulton Q. C. Gardner.

An educational survey of the enlisted personnel of Northeastern Sector conducted by the Special Service Officer, Northeastern Sector, indicates that approximately 40% of the troops are genuinely interested in a duty-time educational program during the readjustment period. Approximately 40% would devote all their time to study. Approximately 40% desires that only 50% of the time be devoted to education and the other 50% to athletics and physical training.

The most popular subjects and the number of men indicating an interest in each follow: Radio 443, Auto Mechanics 447, Electricity 307, Review of Mathematics 284, Business Management 207, Diesel Engines 160, Plastics 155, Air Conditioning 118, Bookkeeping and Accounting 115, Welding 108, English and Grammar 96. Other subjects in which fifty or more men showed interest include: Business Principles, Algebra, Plumbing, Photography, Psychology, Spanish, Painting and Drawing, Carpentry, Mechanical Drawing, and Marine Engines.

Under the present USAFI off-duty program, 303 men in the Harbor Defenses of Northeastern Sector were enrolled in correspondence, self-teaching and university correspondence courses on December 1, 1944. This figure

represents a 48.5% increase over the previous month's enrollment.

A local project of considerable interest has developed through the cooperation of schools at Portland, Maine, in admitting to night sessions 40 men from the Harbor Defenses of Portland. At the Harbor Defenses of New Bedford, men interested in vocational studies have been tendered certain educational facilities of the City of New Bedford during their off-duty time.

At the Harbor Defenses of New York, a simple but ingenious adoption has made the Weekly Newsmag visible in detail to the audience. Slides were made, and then the map was projected upon a large screen. Daily the Harbor Defenses of New York Special Service Officer makes up a news bulletin in three colors which is distributed to all units of the harbor defense.

The complete reports of results of the 6th War Bond Drive in the units of the Northeastern Sector are not yet available, but present data indicate most satisfactory contributions. Approximately 60% of the enlisted men and 82% of the officers of Northeastern Sector personnel have Class "B" allotments. The Harbor Defenses of Narragansett Bay has the best allotment record: approximately 89% of the enlisted men and 100% of the officers. Second is Portland: approximately 77% of the enlisted men and 95% of the officers. Third is Portsmouth: approximately 75% of the enlisted men and 100% of the officers.

The Harbor Defenses of Portland were particularly vigorous in developing competitive spirit among battalions and batteries to stimulate cash buying of bonds in addition to Class "B" allotment deductions. By December 2d, cash sales amounted to \$12,672 and by December 16th cash sales had reached \$29,704. At one battery, a 1st Sergeant announced he would buy double the value of cash bonds purchased by any other man in the battery. Five members of the Harbor Defenses of Portland bought more than \$1,000 (cost price) in bonds during the drive and they were commended by Brigadier General A. G. Strong, commanding the Harbor Defenses of Portland. They were 2nd Lt. A. M. Taylor, ANC, CWO David Coker, M/Sgt. Edward Bays, T/5 William Schork, and Pvt. Annie F. Doyle, WAC.

The 187th Coast Artillery Battalion, Harbor Defenses of Boston, last month conducted a rifle match to which the 143d Cavalry Reconnaissance Troop was invited. The Cavalry promptly proceeded to take top honors for the match, with "B" Battery placing second.



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## TEXTS

### Light on the Law

**MILITARY JUSTICE FOR THE FIELD SOLDIER.** By Colonel Frederick Bernays Weiner. Washington: Infantry Journal, 1944. 152 Pages. \$1.00.

The second edition of Colonel Weiner's popular book is both a revision and enlargement of the first edition. More information is offered about the action of the reviewing authority in trials by special and summary courts-martial, additional suggestions and cautions have been added as a result of the author's experience in the field, and all citations have been brought up to date.

Colonel Weiner knows military law and he knows soldiers, and he knows how to present information in a readable manner. There is nothing dry in the text, which is both instructive and amusing.

### Who Gets What

**CLAIMS TO TERRITORY IN INTERNATIONAL LAW AND RELATIONS.** By Norman Hill. New York: Oxford University Press, 1945. 231 Pages; Maps; Bibliography; Index. \$3.00.

Any student of history knows how territorial and boundary disputes go on and on through the centuries, and that few settlements of such disputes are accepted by the losing side for a day longer than necessity forces them to it. The bases of boundary and territorial disputes are so many—strategic, geographic, historic, economic, ethnic, and many others—that a settlement on one ground may outrage claims under others. Many of these bases are mutually opposed. Right now, ethnic claims, or self-determination, seem to be most favored (at least by Americans) as the true basis for settlement, but the problem is not so simple. In fact, one reading of this book would give the impression that the less the adjudicators of claims know about the subject, the more possibility there is of a wise decision. This impression may be frivolous, but consideration of all the various reasons for claims must lead to utter confusion.

Mr. Hill's discussion of the types of claims and methods of settlements is clearly written and requires little legal or historical knowledge for understanding. It might well be read

by those who very lightly wish to toss Poland or Jugo-Slavia a few thousand square miles of territory to "settle the question once and for all."

## HISTORY AND BIOGRAPHY

### Fire, Movement, and Bluff

**"FIRST WITH THE MOST" FORREST.** By Robert Selig Henry. New York: Bobbs-Merrill Company, 1944. 48 Pages; Notes; Bibliography; Index; Illustrated. \$4.00.

Of the more important Civil War leaders, Forrest is probably the least known, partly because it has been so convenient to substitute legend for fact, and partly because his work was all performed in what was considered a relatively minor theater of the war.

Forrest's rise from civilian to private to lieutenant general in four years, with no military background before the war, is somewhat indicative of his military successes. The farmer and merchant seemed instinctively to know the things that other soldiers take years to learn, and that some never learn at all. It is not suggested that Forrest knew anything of the works of the great military thinkers, but he could practice the deception, movement, surprise, and shock action that made his name a terror to the Union troops. He knew the value of inspection before a command went into battle.

Forrest was his own recruiting officer, his own quartermaster and his own ordnance procurement system. In the course of organizing his units (many of which were taken away from him, causing him to organize new ones from scratch) he recruited the men from Federal territory and from infantry deserters, he fed his men from Federal stocks, and equipped them with Federal guns and mounts. He could use poorly trained, or untrained troops, with more effect than his opponents could use the cream of their mounted forces.

Time after time, reading of Forrest's battles, we note that he sent as little as a single company to a flank, spread them out over a long line, and then with bugles, drums, and shouting bluffed the enemy into thinking regiments and brigades were advancing. Small parties, sent in the direction the Federal thought Forrest should go, were taken for his main forces and pursued while Forrest and his main body took a whack at the enemy at some other point. Usually outnumbered, Forrest

ated mobility and bluff—and won his battles. The few battles in which he did not fare so well were those in which he was under close supervision of senior commanders, who had neither the imagination nor the skill to take advantage of Forrest's flying infantry."

At Rome, Georgia, Forrest captured 1,700 prisoners with a force of less than a third that number. At times he was given credit for having four times his actual number of troops—in his opponent's reports.

After the war, Forrest is believed to have been the national leader of the Ku Klux Klan. The evidence is buried in secrecy, but there is reason to believe that he was the leader who urged the Klan to disband, probably after he realized the potential dangers from such an organization. His fortune (of about \$1,500,000) lost in the war, Forrest tried railroad-building and other business ventures, but never regained his financial position. He died in 1877, at fifty-six.

### World War I

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7TH DIVISION SUMMARY OF OPERATIONS IN THE WORLD WAR. 46 Pages; Appendix; Index; Maps. \$1.00.

8TH DIVISION SUMMARY OF OPERATIONS IN THE WORLD WAR. American Battle Monuments Commission. Washington: Superintendent of Documents, 1945. 38 Pages; Index; Maps. 75¢.

9TH DIVISION SUMMARY OF OPERATIONS IN THE WORLD WAR. 56 Pages; Maps; Index. \$1.00.

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### Fourteen Stars

FIGHTING GENERALS. By Lieutenant General Robert Lee Bullard. Ann Arbor: J. A. Edwards, 1944. 325 Pages; Index; Illustrated. \$5.00.

General Bullard chose seven Major Generals for his gallery of World War fighters: Joseph T. Dickman, Hanson E. Ely, Henry T. Allen, U. G. McAlexander, Preston Brown, William G. Haan, and John F. O'Ryan. Six of these (Allen was the exception) were notoriously hard to get along with, being the stubborn type who fought almost as hard for their own way as they did against the enemy. A fair proportion of them were men who were feared, and in at least one case, hated by their subordinates. One, O'Ryan, was a National Guardsman. But they all had one thing in common—they won their battles. General Bullard's choice of subjects was dictated not by their

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standing among all the generals of the World War, but by his knowledge of the men, gained both in France and in previous service.

To many of us, the World War does not seem so far away—but most of these seven generals helped police the Indians and several were born during the Civil War. Our World War generals were older men than their counterparts of today. In many cases, experience had to be substituted for the schooling our present high-rankers have had.

The book itself would grace any library shelf. Imitation leather binding, pages 8" x 10½", and 127 full-page photographs and drawings combine to create an attractive volume.

## PERSONAL EXPERIENCES

### Unsinkable Cruiser

WHERE AWAY. By George Sessions Perry and Isabel Leighton. New York: Whittlesey House, 1944. 249 Pages; Illustrated. \$2.75.

The story of the cruiser *Marblehead* is one of the inspiring naval stories of this war. Blasted by Jap planes near Borneo, lesser crew might have written off the ship. But with wounds that should have been mortal, the *Marblehead* made it to New York—the long way around, past the Cape of Good Hope through seas infested by Jap ships and planes, and by German subs. Almost half the book is build-up, getting the reader acquainted with the ship and her crew. The latter half tells how they got her home in spite of holes in her bottom, wrecked steering engine, and the rest of the damage that resulted from the Jap bombing. Good seamanship played its part, but a closely knit crew that wouldn't admit defeat was even more important in saving a cruiser at a time when our Navy could ill afford to lose it.

The portion of the book that deals with the attack is as exciting as anything that has come out of this war. Heroism, self-sacrifice, and calm handling of emergencies were commonplace.

Our Navy was at a low point in its career in early 1942, but with men like those on the *Marblehead* to keep things moving until better days came, we couldn't lose.

### Poland in Trouble

STORY OF A SECRET STATE. By Jan Karski. Boston: Houghton Mifflin Company, 1944. 391 Pages. \$3.00.

Jan Karski was a young Polish Reserve artillery officer who was interned by the Russians during the disorganized retreat from the Germans. Reporting to a training camp a few days before the beginning of the war, Karski was caught between the Russian and German millstones before his unit was organized.

Escaping from the Russians, Karski joined the Polish underground, acted as a courier to France, wrote and disseminated propaganda, and did other varied chores. Captured once by the Gestapo, he attempted suicide after a severe mauling, but was saved from death and helped to escape by underground agents who had orders either to effect his escape or to kill him so that he could not be forced to talk.

Karski's story of the Polish underground and of Poland's sufferings cannot help but touch the reader. Throughout history Poland had been an unhappy land, but Hitler has produced some new refinements that make Poland's past misfortunes seem pale. The spirit of the underground, both rank and

is forged both from a love of country and a feeling that life under the Germans is so bad that even death at the hands of the Gestapo could not be much worse.

The underground is organized as a government, with practically all the departments of a government. It is devoted to the usual work of sabotage and other conventional forms of resistance, but more, it is attempting to remain the framework for a free and democratic postwar Poland. To further this aim it is educating the children and the unlettered masses in Polish traditions and aspirations as well as in the usual school subjects, it is fighting the German policy of weakening Polish character by introducing drugs and other forms of vice to Polish youth, and it is keeping alive the flame of resistance.

There have been no Quislings in Poland. There have been those Poles who might have attempted large-scale collaboration, but they did not live long.

### Ambitious Tojo

UNTIL THEY EAT STONES. By Russell Brines. Philadelphia: J. B. Lippincott Company, 1944. 329 Pages; Index. \$3.00.

The Americans interned at Manila enjoyed few of the comforts of home, but were, on the whole, spared the tortures and indignities visited on the Occidentals captured at Singapore and Hong Kong. It was possible to get enough food to keep in fair health, some (but not enough) medicines were available, and the conscious brutalities we have learned to associate with the Jap were not conspicuous. There was boredom and frayed nerves—the captives' lot was not a happy one, but it was bearable.

Filipino civilians, on the other hand, never knew how they were going to fare at the hands of the Japs. The Jap special military police and the Jap civil authorities seemed to have uncoordinated policies, and even these policies changed from time to time. One thing was agreed upon—the Islands were to be exploited economically, and American influence was to be eradicated. The author believes the Japs have been rather efficient at the exploitation, but the effect of their campaign to eradicate American influence cannot be described with a simple yes or no. The Japs have not been as successful with the older folks as they had hoped, but there is some question about how the very young will react.

From Manila Brines went to Shanghai, from which place he was sent home on an exchange ship. He rounds out his book with his estimate of the entire picture of Japan and her expansion. The picture is not all dark, but the light spots are not as large as we would like to believe.

### Pyle Again

BRAVE MEN. By Ernie Pyle. New York: Henry Holt & Company, 1944. 466 Pages; Index. \$3.00.

Reviewing an Ernie Pyle book, especially for a bimonthly magazine, is a discouraging task. All the superlatives have been used, and nothing else will do. *Here is Your War* was one book of personal experiences that received not a single brickbat, and here Pyle comes along with more of the same, this time covering Sicily, Anzio, England, and France.

Ernie Pyle does not write as a military expert, criticizing generals and statesmen, but as a combat observer, going along with the men who actually see the enemy. He writes of their hopes and their gripes, their discomforts and their moments of glory, and of what they think and how they feel. Combat

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### Modern Reconnaissance . . . \$1.50

This compilation of articles which have appeared in *The Cavalry Journal* has been edited and prepared in book form by the editors of *The Cavalry Journal*, and constitutes one of the few books on this military subject ever to appear. Brigadier General H. S. Hawkins contributes a general chapter on reconnaissance, and other chapters describe different specific reconnaissance units and how they operate. 230 pages.

pay is as much due to Pyle as to any other person—when Pyle wrote about it, the lawmakers and the brass knew he had no personal axe to grind and looked into the problem.

All of us have read the little man's columns in the daily papers. Take all those columns, add the material that cable rates and newspaper space caused to be deleted, and you have *Brave Men*—a book that tells as much as mere words can what it is like to fight a war. And remember, too, that Pyle is one of the few correspondents who wrote at length of the AAA—about 5,000 words in this book.

## MISCELLANY

### Mickey Knows

**MACDOUGALL ON DICE AND CARDS.** By Mickey MacDougall. New York: Coward-McCann, Inc., 1944. 90 Pages; Illustrated. \$1.00.

Since soldiers have been known to roll dice and play cards in spite of all the warnings, they might as well have some idea of what is going on when they play. The amateur is bound to be taken for a ride by crooked professionals if he plays with them—the book offers a few hints as to how to recognize these people, but it also warns that the really efficient crook often cannot be detected by the amateur.

The real value of the book, however, is in its rephrasing of the rules of Hoyle so that anyone can understand them. Hoyle, written almost 100 years ago, sounds like doubletalk to most of us—MacDougall uses present-day language. The book covers dice, poker, gin rummy, and blackjack. In addition to the rules of these indoor sports, MacDougall offers some hints as to odds, how to bet, when to bet, and when to take a good long walk. Much of the information offered is of a type that beginners spend much money to learn by experience, and that some beginners never do learn.

### Air Roundup

**THE AVIATION ANNUAL OF 1945.** By Reginald M. Cleveland and Frederick P. Graham. New York: Doubleday, Doran & Company, 1944. 167 Pages; Annual Directory Illustrated. \$3.75.

With authors such as Generals Henry H. Arnold and Harold L. George, Admiral Ernest J. King, Mr. Glenn Martin, and Mr. Charles I. Stanton, to write forewords and special sections in which they are experts, and with the material prepared by aviation writers of long experience, this Annual not only sums up the progress of aviation to date but lifts the curtain on certain future developments. Military and commercial aviation are both covered. There are sixty-four pages of photographs.

The subject material considers Army Air Forces, Naval Aviation, aviation training, aviation manufacturing, postwar employment, and reconversion, aviation research, aircraft of tomorrow, and commercial airlines.

### For Fun

**MORE G.I. LAUGHS.** Selected by Harold Hersey. New York: Sheridan House, 1944. 256 Pages; Illustrated. \$2.00.

Culled from many camp newspapers and service publications, the cartoons and short articles here contain many chuckles—even if a few of them did entertain Caesar and Napoleon. As long as there are armies, recruits will do the same things, and somebody will write about those things, or draw pictures of them. The jeep jokes and the WAC and WAVE situations are all new, at least in application. Service humor still runs to ribbing the First Sergeant, gripes about the chow, camouflage jokes, and the ever-present desire for feminine companionship.

Probably the best short article was one ribbing the series of service slang—and this book has one that runs fifteen pages.

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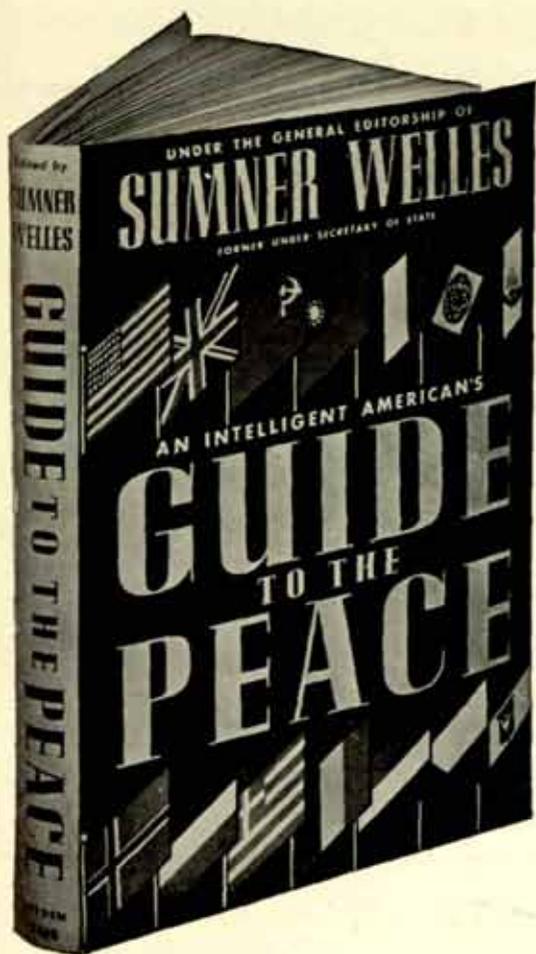
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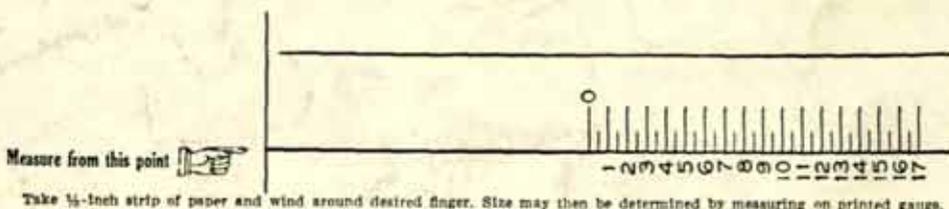
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